City of St. Helena
Planning Commission Regular Meeting
Tuesday, July 21, 2026 @ 6:00 PM
Vintage Hall Board Room
465 Main Street, St. Helena CA

PLEASE NOTE: Any person who wishes to speak regarding an item on the agenda or make a comment under the "Public Forum" portion of the agenda may do so, but please observe the time limit of four minutes.

The Planning Commission meeting will be live-streamed on Comcast Channel 28 and on the City's website.

Public comment for Planning Commission meetings will be accepted via email via to publiccomment@cityofsthelena.gov. All public comments must be received three hours prior to the meeting. All other public comments received after the deadline will be attached to the item the next business day or soon thereafter. Public comments will not be read out loud but will be publicly available and attached to the online Planning Commission agenda.

To ensure interpreters are available, requests must be made at least 72 hours in advance by calling the Office of the City Clerk at (707) 968-2640 or emailing cityclerk@cityofsthelena.gov.

The schedule of upcoming meetings and published meeting agendas can be found on the City of St. Helena website at cityofsthelena.gov.

Servicios de interpretación en español durante la reunión pueden ser solicitados por el público. Para asegurar que los intérpretes estén disponibles, los servicios tienen que ser solicitados al menos 72 horas antes de la reunión llamando a la oficina de la Secretaria de la Ciudad al (707) 968-2640 o por correo electrónico a cityclerk@cityofsthelena.gov.

El horario de las reuniones publicadas y próximas puede ser localizado en el sitio de web de la Ciudad en cityofsthelena.gov

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1. CALL TO ORDER

2. PLEDGE OF ALLEGIANCE AND ROLL CALL

   Chair: Chris Warner
   Vice-Chair: Sue Furdek
   Commissioners: Hector Lopez, and Michelle Covell
   City staff present at the meeting will be noted in the minutes.

3. MINUTES APPROVAL

   3.1. Receive the minutes from the June 16, 2026, Planning Commission Meeting

4. PUBLIC FORUM

   This is an opportunity for the public to address the Commission on items of interest to the public that are NOT listed on the agenda. Because of restrictions imposed by the Brown Act, the Commission may not engage in discussion nor take action on matters not described on the agenda. Please observe the time limit of four minutes.

5. PUBLIC HEARINGS / RECOMMENDATIONS TO CITY COUNCIL

5.1. Request by Elaine Honig for approval of a New Short Term Rental Permit to allow for the use of a single-family residence as a Short-Term Rental at 1248 Stockton St (APN: 009-232-026) in the Medium Density Residential (MR) zoning district.

CEQA Determination: Pursuant to Section 15061(b)3 of the State CEQA Guidelines, the proposed Short-Term Rental is exempt from CEQA. Section 15061(b)(3) (Common Sense Exemption) because it can be seen with certainty that there is no possibility that the proposed Short Term Rental would have significant effect on the environment. The permit does not authorize expansion of the dwelling or intensification beyond the occupancy, parking, noise, event, and operational limits established by SHMC Sections 17.05.100 and 17.22.200.

Prepared By: Natalie Bresee, Assistant Planner

Recommendation: Staff recommends approving the application for a Short-Term Rental permit (STR26-008) at 1248 Stockton Street (APN 009-232-026), including action to approve a CEQA Exemption pursuant to Section 15061(b)3 of the State CEQA Guidelines (Common Sense Exemption), based on the findings and subject to the conditions of approval.

6. SCHEDULED MATTERS

6.1. Napa County Multi-jurisdictional Hazard Mitigation Plan Presentation

CEQA Determination: Not a CEQA Project (CEQA Guidelines §15378)

Prepared By: Natalie Bresee, Assistant Planner

Recommendation: Receive the educational presentation regarding the Napa County Multi-Jurisdictional Hazard Mitigation Plan update. No action will be taken by the Planning Commission.

6.2. Continued 2026 Planning Commission Work Plan

CEQA Determination: Not a CEQA Project (CEQA Guidelines §15378)

Prepared By: Natalie Bresee, Assistant Planner

Recommendation: Receive, discuss, and recommend City Council approval of the proposed Fiscal Year (FY) 2026-27 Planning Commission Work Plan regarding Commission priorities for the upcoming fiscal year.

6.3. Nomination and election of a new Planning Commission Chair and Vice Chair and designation of the Commission Secretary.

CEQA Determination: Not a CEQA Project (CEQA Guidelines §15378)

Prepared By: Natalie Bresee, Assistant Planner

Recommendation: Staff recommends that the Planning Commission, nominate and elect a Chair to serve a one-year term, nominate and elect a Vice Chair to serve a one-year term, and designate the Community Development Director as the Commission Secretary in accordance with Rule 1 of the Planning Commission By-Laws.

7. REPORTS BY STAFF AND PLANNING COMMISSION

Reports by staff and/or committee on items of general interest. Brief questions for clarification may be posed and answered, and Committee may request that items be placed on a future agenda. Except under certain circumstances, the Brown Act prohibits any other discussion or action by the Planning Commission.

8. AGENDA FORECAST

This is an opportunity for the Commission as a majority to request that items be placed on future agendas for discussion in alignment with the City Council direction and/or the current Fiscal Year Planning Commission Workplan.

8.1. Future Agenda Items (Informational Only):
The following items are tentatively scheduled for upcoming Planning Commission meetings and are subject to change. No action will be taken.

August 18, 2026:
New Short-Term Rental Permit

9. ADJOURNMENT

The next Regular Planning Commission meeting is scheduled for August 18, 2026.

This agenda was posted at City Hall, 1088 College Avenue, and at Vintage Hall, 465 Main Street, St. Helena, California on July 15, 2026.

Leza Mikhail, Director of Community Development

Appeal. A person who is dissatisfied with a decision of the Planning Commission may appeal that decision to the City Council pursuant to Municipal Code Section 17.12.020, Appeal procedure. Actions of the Planning Commission will be listed on the City Council agenda the following Tuesday to give the City Council opportunity to review the Planning Commission's decision. Absent of an appeal by the City Council or by a citizen, the appeal period will terminate two weeks after the Planning Commission hearing.

Special Assistance for the Disabled. In compliance with the Americans with Disabilities Act, if you need special assistance to participate in this meeting, please call the City Clerk's Office (707) 967-2792. Notification 48 hours prior to the meeting will enable City to make reasonable arrangements to ensure accessibility to this meeting (28 CFR35.102-35.104 ADA Title II). However, City staff will attempt to assist at any time with accessibility. The City Clerk has equipment to assist those with a hearing impairment.

PUBLIC TESTIMONY PROCEDURES
Pursuant to the Government Code Section 54954.3, the public may address the Commission on each agenda item during the Commission's consideration of that item. Each speaker has the option to state his or her name for the record before testifying. Depending on the number of speakers or the interest of the item, the Planning Commission Chairman may also restrict, at his/her discretion, the speaker's time to three minutes. The Chairman may also restrict public comments if they become irrelevant to the agenda item or repetitious of prior comments. All persons interested may appear and be heard or submit written statements prior to the Planning Commission meeting. Please note that if you challenge the City's decision on any of these matters in court, you may be limited to raising only those issues you or someone else raised at the meeting or in written correspondence delivered to the City at, or prior to, the meeting.

CHALLENGING DECISIONS OF CITY ENTITIES
The time limit within which to commence any lawsuit or legal challenge to any quasi-adjudicative decision made by the City of St. Helena is governed by Section 1094.6 of the Code of Civil Procedure, unless a shorter limitation period is specified by any other provision, including without limitation Government Code section 65009 applicable to many land use and zoning decisions, Government Code section 66499.37 applicable to the Subdivision Map Act, and Public Resources Code section 21167 applicable to the California Environmental Quality Act (CEQA). Under Section 1094.6, any lawsuit or legal challenge to any quasi-adjudicative decision made by the City must be filed no later than the 90th day following the date on which such decision becomes final. Any lawsuit or legal challenge, which is not filed within that 90-day period, will be barred. Government Code section 65009 and 66499.37, and Public Resources Code section 21167, impose shorter limitations periods and requirements, including timely service in addition to filing.

If a person wishes to challenge the above actions in court, they may be limited to raising only those issues they or someone else raised at the meeting described in this notice, or in written correspondence delivered to the City of St. Helena, at or prior to the meeting. In addition, judicial challenge may be limited or barred where the interested party has not sought and exhausted all available administrative remedies.

SUPPLEMENTAL MATERIAL RECEIVED AFTER THE POSTING OF THE AGENDA
Any supplemental writings or documents distributed to a majority of the Planning Commission regarding any item on this Agenda, after the posting of the Agenda, will be available for public review in the City Clerk's Office located at 1088 College Avenue, St. Helena, California, during normal business hours and by appointment. In addition, such writings or documents will be made available on the City's website at cityofsthelena.gov and will be available for public review at the respective meeting.

MINUTES
City of St. Helena
Regular Planning Commission Meeting
Tuesday, June 16, 2026 @ 6:00 PM
Vintage Hall Board Room
465 Main Street, St. Helena CA

Present: Commissioner Michelle Covell, Commissioner Sue Furdek, Commissioner Hector Lopez
Absent: Chair Christopher Warner, Commissioner Autumn Anderson

1. PLEDGE OF ALLEGIANCE

Commissioner Covell led the Pledge of Allegiance.

2. CALL TO ORDER AND ROLL CALL

Chair: Chris Warner
Vice-Chair: Sue Furdek
Commissioners: Autumn Anderson, Hector Lopez and Michelle Covell
City staff present at the meeting will be noted in the minutes.

Present: Vice-Chair Sue Furdek, Commissioner Michelle Covell, Commissioner Hector Lopez
Absent: Chair Christopher Warner, Commissioner Autumn Anderson
Staff Present: Community Development Director Leza Mikhail, Senior Planner Jackie Oneal, Assistant Planner Natalie Bresee

3. PUBLIC FORUM

This is an opportunity for the public to address the Commission on items of interest to the public that are NOT listed on the agenda. Because of restrictions imposed by the Brown Act, the Commission may not engage in discussion nor take action on matters not described on the agenda. Please observe the time limit of four minutes.

3.1. Public Comment

Vice-Chair Furdek noted that one written comment was received prior to the meeting.

Vice-Chair Furdek opened the meeting for public comment.
No one from the public spoke.

Vice-Chair Furdek closed the meeting for public comment.

4. CONSENT ITEMS

Members of the Commission or the public may ask that any items be considered individually for purposes of considering alternative action, for extended discussion, or for public comment. Unless that is done, one motion may be used to adopt all recommended actions. (Roll Call Vote)

None

5. PUBLIC HEARINGS

5.1. Revised Recommendation for Zoning Ordinance Amendment (ZOA 26-002) Amending Section 17.33 (Definitions) and Related Provisions of the St. Helena Municipal Code Concerning On-Site Storage Facilities

CEQA Determination: Categorical Exemption / Common Sense Exemption (§15061(b)(3))
Prepared By: Jackie Oneal, Senior Planner Recommendation:

1. Find that the proposed amendments to Section 17.33 (Definitions) and related provisions of the St. Helena Municipal Code are exempt from the California Environmental Quality Act (CEQA) pursuant to CEQA Guidelines Section 15061(b)(3); and

2. Adopt a revised resolution recommending that the City Council adopt Ordinance ZOA 26-002 amending Section 17.33 (Definitions) and Table 17.17.020(A) of the St. Helena Municipal Code to clarify the definition and regulation of On-Site Storage Facilities.

Senior Planner, Jackie Oneal gave a presentation.

Vice-Chair Furdek opened the meeting for public comment.
No one from the public spoke.
Vice-Chair Furdek closed the meeting for public comment.

The commission discussed the item.

Commissioner Michelle Covell moved to accept staff's recommendation and recommended language, but recommend that City Council strike the word facilities from the definition to provide further clarity. The motion was seconded by Commissioner Hector Lopez and on roll call carried by the following vote:

AYES: Commissioner Michelle Covell, Commissioner Sue Furdek, Commissioner Hector Lopez
NOES: None
ABSENT: Board Member Christopher Warner, Commissioner Autumn Anderson
ABSTAIN: None
RECUSE: None

5.2. Continuance of Accessory Dwelling Unit Ordinance Amendment (Zoning Ordinance Amendment ZOA 26-001)

CEQA Determination: The continuance of this item is not a project subject to the California Environmental Quality Act (CEQA).
Prepared By: Jackie Oneal, Senior Planner
Recommendation: Continue the Accessory Dwelling Unit Ordinance Amendment to the Planning Commission meeting of July 7, 2026.

Commissioner Michelle Covell moved to continue the Accessory Dwelling Unit Ordinance Amendment to the Planning Commission meeting of July 7, 2026. The motion was seconded by Commissioner Hector Lopez and on roll call carried by the following vote:

AYES: Commissioner Michelle Covell, Commissioner Sue Furdek, Commissioner Hector Lopez
NOES: None
ABSENT: Board Member Christopher Warner, Commissioner Autumn Anderson
ABSTAIN: None
RECUSE: None

6. SCHEDULED ITEMS

6.1. Short-Term Rental (STR) Ordinance Study Session

CEQA Determination: This study session is not a project under Section 15378 of the California Environmental Quality Act (CEQA) Guidelines because it involves only the exchange of information, discussion, and direction regarding potential future actions. No commitment to a specific course of action is being made at this time.

Prepared By: Natalie Bresee, Assistant Planner
Recommendation: Receive the staff presentation, receive public and Planning

Commission input regarding potential amendments to the City's Short-Term Rental Ordinance. This item is for discussion purposes only and no formal action will be taken.

Assistant Planner, Natalie Bresee gave a presentation.

Vice-Chair Furdek opened the meeting for public comment.
Tom Belt, Shavonna Kelley, Mary Stephenson, Marie Phillips, Jim Sweeny, John Sales, Tamara Sorensen, Susane Tate, and Elaine de Man spoke. **Vice-Chair Furdek closed the meeting for public comment.**

The commission discussed the item.

7. REPORTS BY STAFF/COMMITTEE

Reports by staff and/or committee on items of general interest. Brief questions for clarification may be posed and answered, and Committee may request that items be placed on a future agenda. Except under certain circumstances, the Brown Act prohibits any other discussion or action by the Planning Commission.

None

8. AGENDA FORECAST AND COMMISSION REQUESTS

This is an opportunity for the Commission as a whole to request items be placed on future agendas for discussion. These items should be consistent with, and work to implement adopted Council Goals. A list of current planning projects is available on our city website in the link below: cityofsthelena.gov/230/Planning-Project

8.1. Future Agenda Items (Informational Only):

The following items are tentatively scheduled for upcoming Planning Commission meetings and are subject to change. No action will be taken.

July 7, 2026:
Zoning Ordinance Amendment (ADU/JADU)
New Short-Term Rental Permit

July 21, 2026:
Major Design Review

Community Development Director, Leza Mikhail addressed the commission.

Vice-Chair Furdek and Commissioner Covell made a request for a Future Agenda Items.

9. ADJOURNMENT

The next Regular Planning Commission meeting is scheduled for July 7, 2026.

Vice-Chair Furdek adjourned the meeting at **8:37 p.m.**

APPROVED:	**ATTEST:**
_____	_____
Christopher Warner, Chair	Leza Mikhail, Director of Community Development

Agenda Report to the Planning Commission

Agenda Section: PUBLIC HEARINGS / RECOMMENDATIONS TO CITY COUNCIL
Department: Community Development Department - Planning Division

DATE:	July 21, 2026
FILE NUMBER:	STR26-008
SUBJECT:	Request by Elaine Honig, owner-applicant and trustee, for approval of a Short-Term Rental Permit to rent a one-bedroom, one-and-one-half bathroom single family residence with an office located at 1248 Stockton Street in the Medium Density Residential (MR) zoning district in accordance with the requirements of the Short-Term Rental Ordinance.
LOCATION OF PROPERTY:	1248 Stockton Street, St. Helena, CA 94574
APN:	009-232-026
GENERAL PLAN/ ZONING:	Medium Density Residential (MDR)/ Medium Density Residential (MR)
APPLICANT:	Elaine Honig
PROJECT PLANNER:	Natalie Bresee, Assistant Planner
REVIEWED BY:	Leza Mikhail, Community Development Director
CEQA DETERMINATION:	Pursuant to Section 15061(b)3 of the State CEQA Guidelines, the proposed Short-Term Rental is exempt from CEQA. Section 15061(b)(3) (Common Sense Exemption) because it can be seen with certainty that there is no possibility that the proposed Short Term Rental would have significant effect on the environment. The permit does not authorize expansion of the dwelling or intensification beyond the occupancy, parking, noise, event, and operational limits established by SHMC Sections 17.05.100 and 17.22.200.
RECOMMENDED ACTION:	Staff recommends approving the application for a Short-Term Rental permit (STR26-008) at 1248 Stockton Street (APN 009-232-026), including action to approve a CEQA Exemption pursuant to Section 15061(b)3 of the State CEQA Guidelines (Common Sense Exemption), based on the findings and subject to the conditions of approval.

BACKGROUND:
The applicant applied for a new Short-Term Rental permit on May 14, 2026. In accordance with SHMC 17.05.100, a notice of application was sent to all residents and property owners within 300 feet of the subject parcel on June 23, 2026, informing them of the new Short-Term Rental application and notifying them that they may submit written comments on the application.

At its July 7, 2026 meeting, the Planning Commission continued the public hearing for the Short-Term Rental Permit application (STR26-008) located at 1248 Stockton Street, to the Planning Commission meeting of July 21, 2026 at 6:00 p.m.

The subject property has an existing single-family residence with 1 bedroom, one and one-half bathroom, and office. The property is not listed on the historic resource inventory.

PROJECT DESCRIPTION:
The applicant is proposing to establish a new Short-Term Rental (STR) within an existing single-family residence located at 1248 Stockton Street in the Medium Density Residential (MR) Zoning District. The site currently provides one on-site parking space. To meet the parking requirements of the City's Short-Term Rental Ordinance, the applicant proposes to remove an existing accessory shed and construct a second on-site parking space.

ANALYSIS:
General Plan / Zoning
The property is designated Medium Density Residential (MDR) under the General Plan and is zoned Medium Density Residential (MR). The MDR designation allows residential uses including single-family detached and attached units, as well as compatible uses, at densities ranging from 5.1 to 16 dwelling units per acre. The MR zoning district implements this designation and is intended to maintain existing residential development patterns while accommodating a range of housing types, including single-family dwellings, duplexes, triplexes, and accessory dwelling units, consistent with the City’s historic medium-density residential areas.

The underlying structure would remain a single-family dwelling, and STR use is allowed only subject to approval of a Short-Term Rental Permit and compliance with SHMC Sections 17.05.100 and 17.22.200.”

Development Code Consistency
St. Helena Municipal Code (SHMC) Section 17.22.200 regulates Short-Term Rentals. The purpose of the STR ordinance is to establish a permitting process and appropriate restrictions and standards for the Short-Term Rental of single-family dwellings to:

- Provide a visitor experience and accommodation as an alternative to the hotel, motel, and bed and breakfast accommodations currently existing in the city; and
- Ensure the collection and payment of transient occupancy taxes (TOT); and
- Minimize the negative secondary effects of Short-Term Rental use on surrounding

residential neighborhoods; and
- Retain the character of the neighborhoods in which any such use occurs.

Discussion - Findings

Pursuant to St. Helena Municipal Code Section 17.05.100 the proposed project is subject to Planning Commission review and approval. The Planning Commission's review should consider the effect the proposed Short-Term Rental use would have on surrounding uses and the cumulative impacts within the community. The Planning Commission must make all required findings to approve the Conditional Use Permit Amendment. The required findings are identified below in bold, followed by staff's response in regular text.

1. **The Short-Term Rental complies with applicable standards identified in Section 17.22.200, Short-term rentals.**

   Staff response: The establishment of a Short-Term Rental at the subject property is compliant with all applicable standards identified in Section 17.22.200, with the exception of the required two on-site parking spaces. Condition No. 3 requires the provision of two on-site parking spaces prior to operation and establishes verification by Planning Division staff prior to issuance of a business license.

2. **The establishment of a Short-Term Rental at the subject property is consistent with the purpose of the general plan, including policies regarding the displacement of rental units in the housing stock**.

   Staff response: The establishment of a Short-Term Rental at the subject property is consistent with the General Plan in that the number of Short-Term Rental permits is capped at twenty-five to reduce impacts on rental housing.

3. **The establishment of a Short-Term Rental at the subject property will not be detrimental to a building, structure, or feature of significant aesthetic, cultural, architectural, or engineering interest or value of a historical nature.**

   Staff response: The subject property is not listed on the City's Historic Resources Master List. The establishment of a Short-Term Rental in the 1-bedroom, 1.5 bathroom single family residence of a Medium Density Residential zoned property and the proposed alterations to accommodate the additional required parking space would not be detrimental to a building, structure or feature of significant aesthetic, cultural, architectural or engineering interest or value of a historic nature.

4. **The establishment of a Short-Term Rental at the project site is compatible with and will not be detrimental to the character of the neighborhood and surrounding land uses.**

   Staff response: The establishment of a Short-Term Rental in the 1-bedroom, 1.5 bathroom

single family residence on a Medium Density Residential zoned property would not be detrimental to the character of the neighborhood or surrounding land uses due to the maximum occupancy being four people.

5. **The establishment of a Short-Term Rental at the project site will provide an enhanced visitor experience and accommodation as an alternative to the hotel, motel, and bed and breakfast accommodations currently existing in the city and will help to ensure the collection and payment of transient occupancy taxes (TOT).**

   Staff response: The establishment of a Short-Term Rental at the subject property would provide visitors with the opportunity to stay in an existing residential neighborhood as an alternative to traditional lodging accommodations available within the city. The issuance of a Short-Term Rental permit would also help ensure the collection and payment of transient occupancy taxes, as permit holders are required to submit monthly TOT reports and remit all applicable taxes to the City.

6. **There exists no substantial evidence of operation of an unpermitted Short-Term Rental on the part of the applicant anywhere within the city.**

   Staff response: There is no substantial evidence that there has been an operation of an unpermitted Short-Term Rental at the subject property or by the applicant anywhere within the city.

Staff finds that the proposed Short-Term Rental is consistent with the General Plan, complies with applicable Municipal Code requirements, and satisfies the required findings for approval.

ISSUES:

There is currently only one parking space on-site, where the Code requires two. Staff has provided a condition of approval that requires all necessary improvements related to parking be completed and inspected by staff prior to operation or issuance of a business license. to ensure that the project provides the two required on-site parking spaces prior to operation. This is necessary to verify that adequate parking is in place and to prevent commencement of business activities prior to compliance with the approved site plan. Failure to meet this requirement will result in revocation of the permit approval.

CORRESPONDENCE:

At the time of agenda publication, staff received no correspondence related to this application.

STAFF RECOMMENDATION:

Staff recommends approving the Short-Term Rental permit (STR26-008) at 1248 Stockton Street (APN 009-232-026), including action to approve a Categorical Exemption pursuant to Section 15061(B)3 of the State CEQA Guidelines, based on the findings and subject to the conditions of approval.

ATTACHMENTS:

1. Resolution - STR26-008
2. Written Statement_STR26-008
3. Site Plan_STR26-008
4. Floor Plan_STR26-008

CITY OF ST. HELENA PLANNING COMMISSION
RESOLUTION NO. _____
APPROVING A SHORT-TERM RENTAL PERMIT FOR
1248 Stockton Street (STR26-008)

PROPERTY OWNERS: HONIG ELAINE TRUST **APN:** 009-232-026

RECITALS

WHEREAS, on May 14, 2026, the applicant submitted an application for a Short-Term Rental permit for the property located at 1248 Stockton St. in the Medium Density Residential (MR) zoning district;

WHEREAS, staff confirmed the applicant's eligibility to apply for a Short-Term Rental permit under the Short-Term Rental ordinance's restrictions and standards (St. Helena Municipal Code Section 17.22.200);

WHEREAS, in accordance with the Short-Term Rental ordinance, a Notice of Application was sent to all residents and property owners within 300 feet of the subject parcel on June 23, 2026, informing them of the Short-Term Rental application and notifying them that they may submit written comments on the application;

WHEREAS, a public hearing notice was published in the Napa Valley Register and mailed to property owners within 300 feet of the project site in compliance with state and local law;

WHEREAS, the Planning Commission meeting scheduled for July 7, 2026, at 6:00 p.m. was canceled;

WHEREAS, at the Special Planning Commission Meeting on July 7, 2026 at 4:00 p.m. the Planning Commission continued the public hearing for the Short-Term Rental Permit application (STR26-008) located at 1248 Stockton Street, to the Planning Commission meeting of July 21, 2026, at 6:00 p.m.;

WHEREAS, the Planning Commission of the City of St. Helena, State of California, considered the project, staff report, and all testimony, written and spoken, at a duly noticed public hearing on July 21, 2026 at 6:00 p.m. ;and

NOW, THEREFORE, LET IT BE FOUND THAT, the Planning Commission approves the Short-Term Rental Permit based on the findings below and subject to the conditions of approval enumerated herein.

RESOLUTION

A. Pursuant to Section 15061(b)3 of the State CEQA Guidelines, the proposed Short-Term Rental is exempt from CEQA. Section 15061(b)(3) (Common Sense Exemption) because it can be seen with certainty that there is no possibility that the proposed Short-Term Rental would not have significant effect on the environment. The permit

does not authorize expansion of the dwelling or intensification beyond the occupancy, parking, noise, event, and operational limits established by SHMC Sections 17.05.100 and 17.22.200.

B. The Planning Commission hereby finds that the Short-Term Rental Permit application complies with the following required findings pursuant to Section 17.05.100 of the St. Helena Municipal Code:

1. The Short-Term Rental complies with applicable standards identified in Section 17.22.200, Short-term rentals;

2. The establishment of a Short-Term Rental at the subject property is consistent with the purpose of the general plan, including policies regarding the displacement of rental units in the housing stock;

3. The establishment of a Short-Term Rental at the subject property will not be detrimental to a building, structure, or feature of significant aesthetic, cultural, architectural, or engineering interest or value of a historical nature;

4. The establishment of a Short-Term Rental at the project site is compatible with and will not be detrimental to the character of the neighborhood and surrounding land uses;

5. The establishment of a Short-Term Rental at the project site will provide an enhanced visitor experience and accommodation as an alternative to the hotel, motel, and bed and breakfast accommodations currently existing in the city and will help to ensure the collection and payment of transient occupancy taxes (TOT); and

6. There exists no substantial evidence of operation of an unpermitted Short-Term Rental on the part of the applicant anywhere within the city.

CONDITIONS OF APPROVAL

The Short-Term Rental Permit for the above described property is granted subject to compliance with the following conditions:

1. The permit shall comply with all City ordinances, rules, regulations and policies in effect at the time of issuance of the permit. The conditions noted below are particularly pertinent to this permit and shall not be construed to permit violation of other laws and policies not so listed.

2. Pursuant to the St. Helena Municipal Code, Section 17.22.200. This Short-Term Rental permit shall be subject to the following restrictions and standards:

    a. The Short-Term Rental permit must be in the name of the owner-applicant, who must be an owner of the real property upon which the Short-Term Rental use is to be permitted. One person may hold no more than one Short-Term Rental permit and there shall be no more than one (1) Short-Term Rental unit per property. The permit is not transferable.

    b. The maximum number of bedrooms used for Short-Term Rental use in the Short-Term Rental dwelling must be no greater than one (1). The total number of guests staying in the Short-Term Rental dwelling at any one time must be no greater than two times the number of bedrooms plus two persons, up to a maximum of four (4) persons. The office room shall not be used, advertised, furnished, or occupied as a sleeping room.

    c. Short-Term Rental dwellings must meet all applicable building, health, fire and related safety codes at all times and shall be inspected by the fire department before any Short-Term Rental activity can occur. No STR activity shall occur until the Fire Department has completed the required inspection and approved the dwelling for STR use.

    d. A minimum of two on-site parking spaces must be provided for use by the Short-Term Rental occupants and maintained during the life of the Short-Term Rental permit.

    e. The owner-applicant must keep on file with the city the name, address, telephone number, cell phone number, and email address of a local contact person who shall be responsible for responding to questions or concerns regarding the operation of the Short-Term Rental. This information must be posted in a conspicuous location within the Short-Term Rental dwelling. The local contact person shall be available twenty-four (24) hours a day to accept telephone calls and respond physically to the Short-Term Rental within thirty (30) minutes when the Short-Term Rental is rented and occupied. The City shall post the name and contact information of the local contact person associated with each Short-Term Rental on the city's webpage. The City reserves the right to reject a local contact person if their location is out of the area.

    f. The owner-applicant must post "house policies" within each guest bedroom. The house policies must be included in the rental agreement, which must be signed by the renter and must be enforced by the owner-applicant or the owner-applicant's designated contact person. The house policies at a minimum must include the following provisions:

        i. Quiet hours must be maintained from ten p.m. to seven a.m., during which noise within or outside the Short-Term Rental dwelling must not disturb anyone on a neighboring property.

        ii. Outdoor amplified sound is prohibited.

iii. Except as permitted by the Community Development Director, vehicles must be parked in the designated on-site parking area and must not be parked on the street overnight.

iv. Parties or group gatherings which exceed the maximum number of allowed guests and/or which have the potential to cause traffic, parking, noise or other problems in the neighborhood are prohibited from occurring at the Short-Term Rental property.

v. Guests must not leave any waste or trash outside the house.

g. Auctions, weddings, commercial functions, and any other similar events which have the potential to cause traffic, parking, noise or other problems in the neighborhood are prohibited.

h. The owner-applicant must ensure that the occupants and/or guests of the Short-Term Rental use do not create unreasonable noise or disturbances, engage in disorderly conduct, or violate provisions of this code or any state law pertaining to noise, disorderly conduct, the consumption of alcohol, or the use of illegal drugs or be subject to fines and penalties levied by the city up to and including revocation of the Short-Term Rental permit.

i. The owner-applicant, upon notification that occupants and/or guests of his or her Short-Term Rental use have created unreasonable noise or disturbances, engaged in disorderly conduct or committed violations of this code or state law pertaining to noise, disorderly conduct, the consumption of alcohol or the use of illegal drugs, must prevent a recurrence of such conduct by those occupants or guests or be subject to fines and penalties levied by the city up to and including revocation of the Short-Term Rental permit.

j. All advertising for any Short-Term Rental, including electronic advertising on Short-Term Rental websites, must include the number of the Short-Term Rental permit granted to the owner-applicant.

k. The owner-applicant must maintain city business licenses and pay all transient occupancy taxes in accordance with Chapter 3.28, Transient Occupancy Tax, as required.

l. Short-Term Rental permit holders are required to rent their properties on a short-term basis for a minimum (average) of sixty (60) days per year. Individual permit holders who do not meet this minimum rental activity may (at the determination of the community development director) have their renewal denied and/or reviewed by the planning commission at a noticed public hearing. Short-Term Rental permit holders who utilize their primary residence for Short-Term Rental activities are exempt from this requirement.

3. Prior to commencement of operation, and within 60 days of permit approval, the permittee shall complete all required improvements to provide the two (2) on-site parking spaces as proposed. A business license shall not be issued, and advertising shall not

occur, until Planning Division staff has inspected the site and verified that this condition has been fully satisfied. Failure to complete this condition within the specified time frame will result in revocation of the permit approval.

4. This Short-Term Rental Permit shall be valid for two years from the effective date unless earlier revoked or unless renewed in accordance with SHMC Section 17.05.100

5. A renewal application and applicable fees must be submitted at least 30 days before permit expiration.

I HEREBY CERTIFY that the foregoing Short-Term Rental permit was duly and regularly approved by the Planning Commission of the City of St. Helena at a regular meeting of said Planning Commission held on July 21, 2026, by the following roll call vote:

AYES:

NOES:

ABSENT:

ABSTAIN:

APPROVED:

Chris Warner
Chair, Planning Commission

ATTEST:

Leza Mikhail
Community Development Director

Statement of Purpose

Short-Term Rental Permit Application

1248 Stockton Street, St. Helena, CA

To the St. Helena Planning Commission:

I am applying for a short-term rental permit for my home at 1248 Stockton Street, a historic one-bedroom, one-and-a-half-bath cottage that I have fully renovated. The property is my residence, and I intend to continue living there. My plan is to begin by renting it on a short-term basis for approximately 90 days per year, adjusting modestly over time as I learn what works well for the home, the neighbors, and the guests.

I have been hosting furnished rentals for several years and currently operate three other properties, two in Napa and one in Bend, Oregon, all rented on a monthly basis under a consistent design identity I've developed called "Art Collector's…". My Airbnb host profile, reviews, and ratings across these properties reflect a careful, hands-on approach to hospitality and a strong track record with guests and neighbors alike. Examples of the properties and my host history are available here:

- Napa Duplex Main House: https://www.airbnb.com/rooms/740831229973753532
- Napa Duplex Guest House: https://www.airbnb.com/rooms/741266811884774621
- Bend, Oregon property: https://www.airbnb.com/rooms/53156858
- Host profile: https://www.airbnb.com/users/profile/about?context=host

What draws me to this work is the creative side of it. I genuinely enjoy renovating homes, furnishing them thoughtfully, and then sharing those spaces with visitors who appreciate them. To me, a beautifully restored home is meant to be shared. I love living in this cottage, and I also love the idea of opening it up to guests who will appreciate it the way I do. Short-term rental allows me to share the Stockton Street cottage with a wider range of guests while continuing to maintain it to a high standard as my own home.

I believe this property is well suited to a short-term rental permit for several reasons:

- **It is my home.** I live on-site and have a direct, ongoing interest in being a good neighbor, keeping the property in excellent condition, and ensuring guests respect the surrounding community.
- **The cottage is small.** With one bedroom, it accommodates a small number of guests, typically a couple, which keeps noise, parking, and traffic impacts minimal.
- **I am an experienced host.** My existing rentals demonstrate consistent guest screening, clear house rules, responsive communication, and a design and hosting standard that attracts quiet, considerate visitors rather than party-style bookings.
- **It supports St. Helena's goals.** A well-managed, owner-occupied short-term rental offers visitors an alternative to hotels, contributes transient occupancy tax revenue to the city, and preserves the residential character of the neighborhood because the home remains a home, not a commercial property.

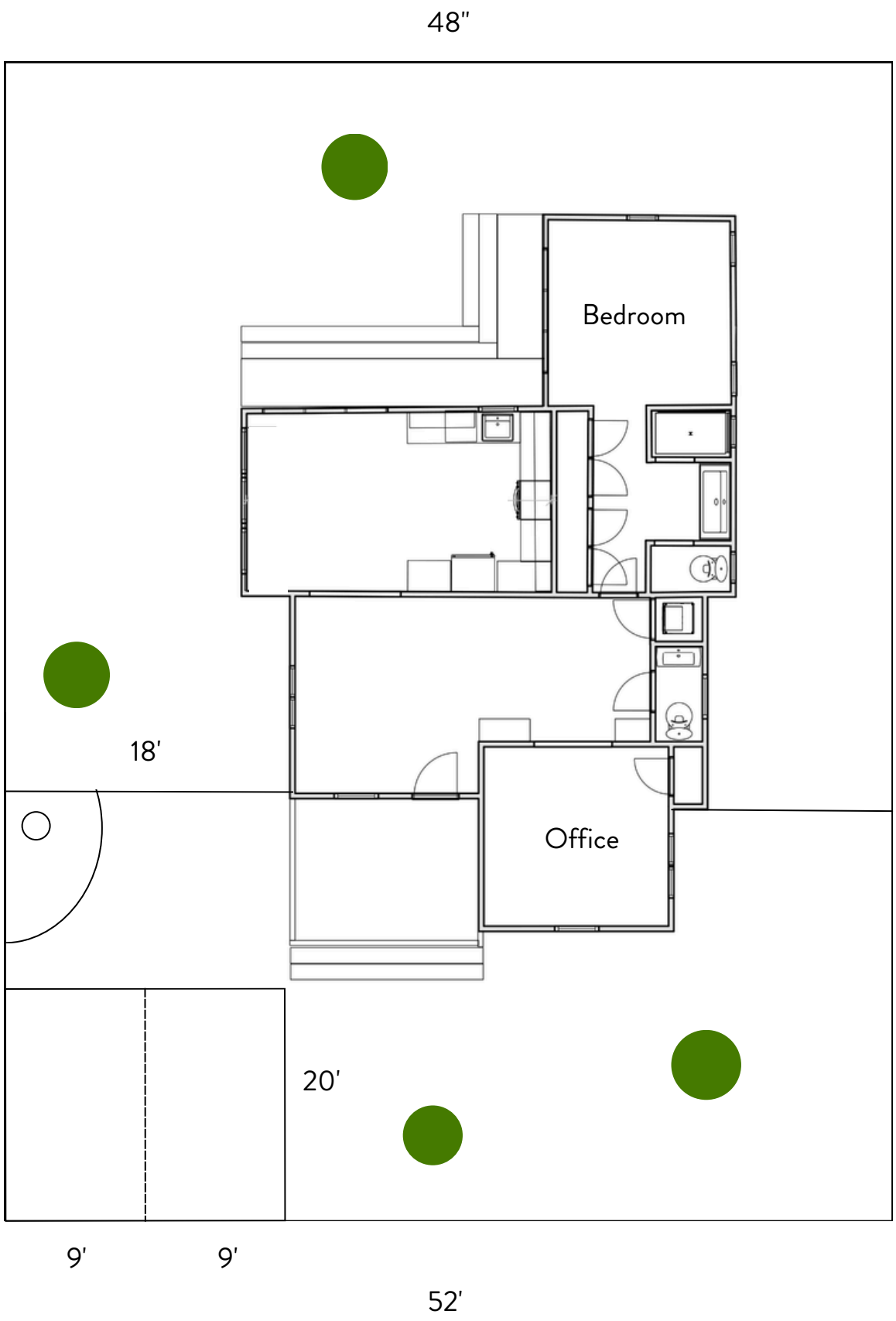
I am committed to operating in full compliance with St. Helena Municipal Code Section 17.22.200, including all requirements regarding occupancy, parking, local contact availability, transient occupancy tax collection, and good-neighbor practices.

Thank you for your consideration. I would be glad to answer any questions the Commission may have.

Sincerely,

Elaine Honig

Site Plan

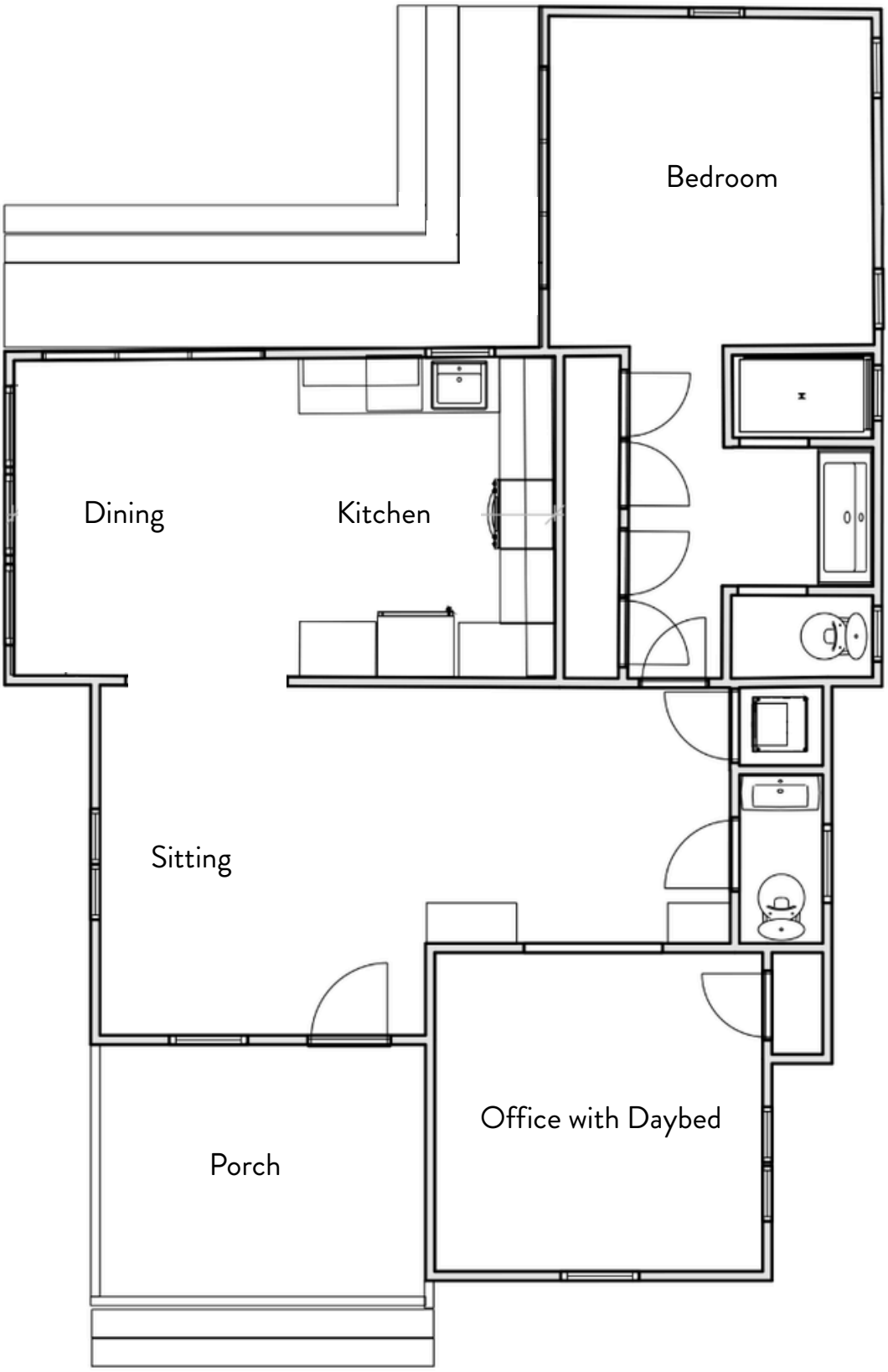


Remove shed to make room for 2nd parking space

Floor Plan

1 Bedroom/1.5 Bath

2 people



Agenda Report to the Planning Commission

Agenda Section: SCHEDULED MATTERS
Department: Community Development Department - Planning Division

DATE:	July 21, 2026
FILE NUMBER:	N/A
SUBJECT:	Receive a Presentation on the Napa County Multi-Jurisdictional Hazard Mitigation Plan
LOCATION OF PROPERTY:	City Wide
APN:	City Wide
GENERAL PLAN/ ZONING:	City Wide
APPLICANT:	N/A
PROJECT PLANNER:	Natalie Bresee, Assistant Planner
REVIEWED BY:	Leza Mikhail, Community Development Director
CEQA DETERMINATION:	Not a CEQA Project (CEQA Guidelines §15378)
RECOMMENDED ACTION:	Receive the educational presentation regarding the Napa County Multi-Jurisdictional Hazard Mitigation Plan update. No action will be taken by the Planning Commission.

BACKGROUND:
The Napa County Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) is a countywide planning effort led by Napa County in coordination with participating jurisdictions, including the City of St. Helena. The plan identifies natural hazards, evaluates community vulnerabilities, and establishes mitigation strategies to reduce the impacts of future hazard events.

As required by State law, Napa County is currently updating the MJHMP to incorporate updated hazard information, community input, and mitigation actions that support long-term resilience and maintain eligibility for certain hazard mitigation grant programs. This plan is a 'regional plan' that assesses shared regional risks and outlines coordinated, long-term strategies to protect life, property and infrastructure from a regional perspective. This plan is not intended to replace/superseded locally prepared plans, but instead to compliment existing local plans, or provide a baseline to expand locally detailed plans to mitigate hazards, such as evacuation plans or local emergency response plans.

Brieanna Jones, MPH, Emergency Services Officer with Napa County Office of Emergency Services, will provide an informational presentation on the MJHMP update. This presentation is for informational purposes only; no Planning Commission action or direction is requested. General questions about the background and purpose of the MJHMP are invited. The City's Fire Chief and Interim Police Chief will also be in attendance.

PROJECT DESCRIPTION:
N/A

ANALYSIS:
N/A

ISSUES:
N/A

CORRESPONDENCE:
N/A

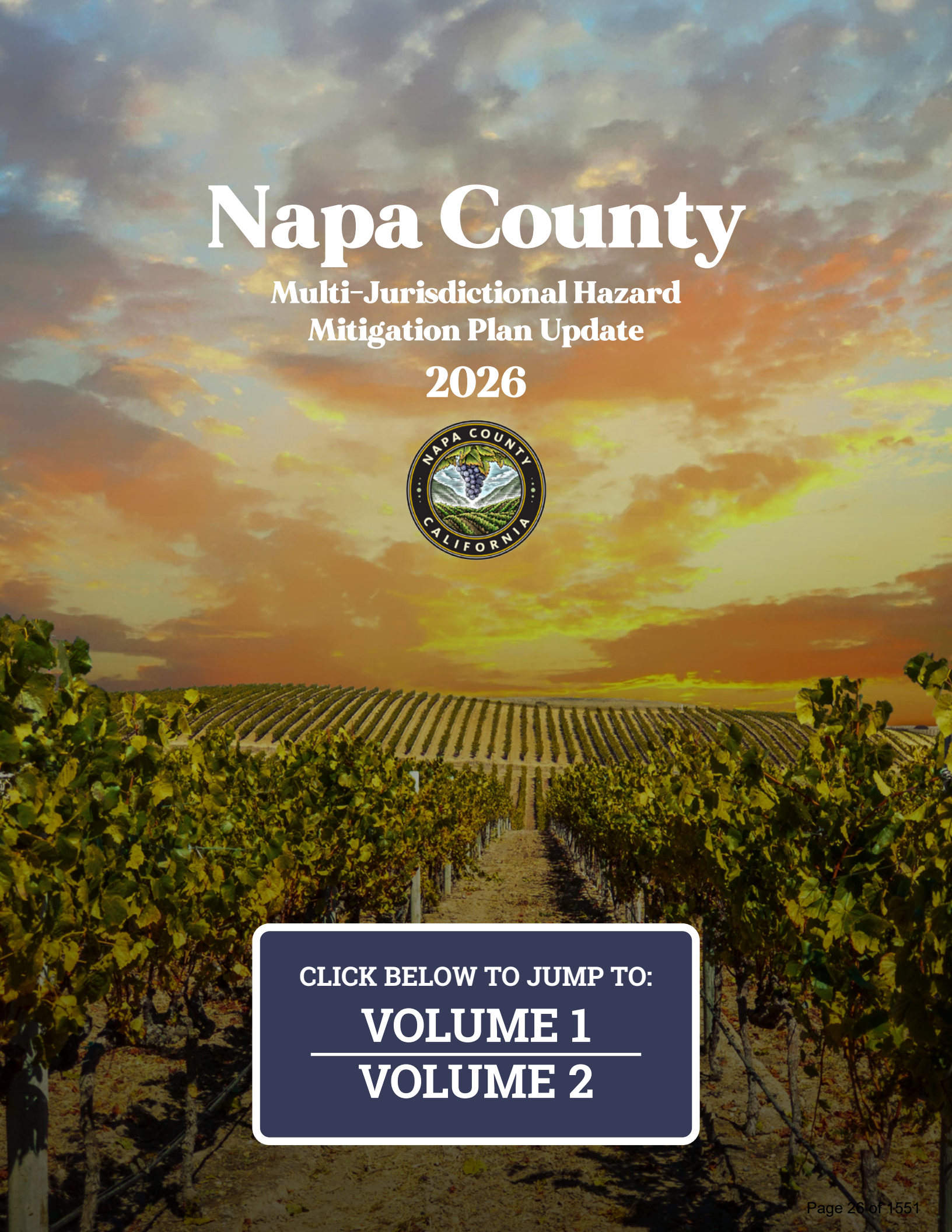
STAFF RECOMMENDATION:
Receive the educational presentation regarding the Napa County Multi-Jurisdictional Hazard Mitigation Plan update. No action will be taken by the Planning Commission.

ATTACHMENTS:
1. 03 Cal OES Draft Napa County MJHMP 20260625
2. Presentation - Multi-Jurisdictional Hazard Mitigation Plan

Napa County

Multi-Jurisdictional Hazard Mitigation Plan Update

2026

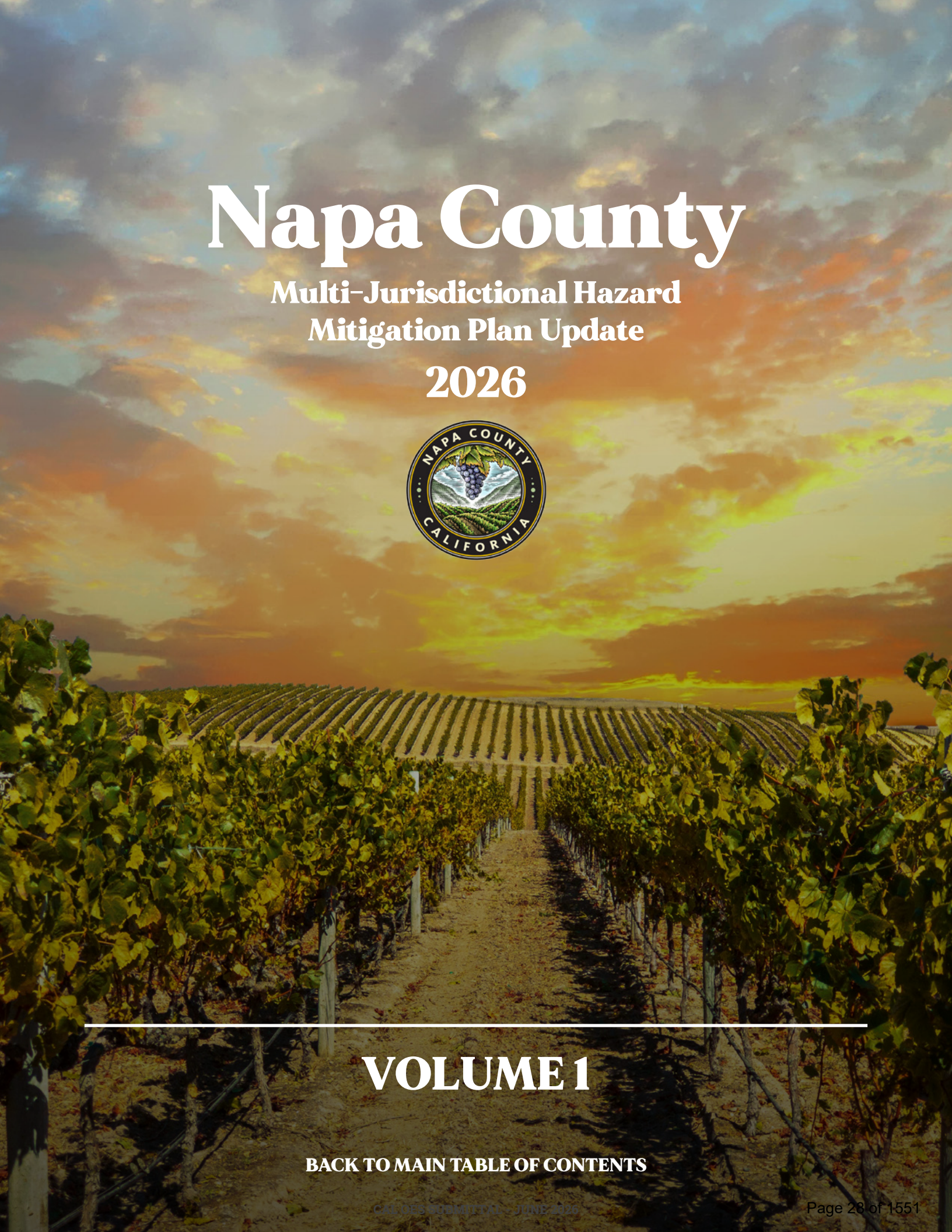


CLICK BELOW TO JUMP TO:

VOLUME 1

VOLUME 2

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Napa County

Multi-Jurisdictional Hazard Mitigation Plan Update

2026

VOLUME 1

BACK TO MAIN TABLE OF CONTENTS

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Napa County

2026 Multi-Jurisdictional Hazard Mitigation Plan

Volume 1: County-Wide Elements

Executive Summary ..... **ix**
Adoption Records ..... **xxi**
Volume 1 ..... **1-1**
Section 1. Introduction **1-2**
1.1 Participating Jurisdictions 1-2
1.2 Purpose & Scope 1-3
1.3 How to Use This Plan 1-7
1.4 What's New 1-8
1.4.1 Background: 2020 vs. 2026 ..... *1-9*
1.4.2 Mitigation Activities *1-11*
1.4.3 New Analysis & Risk Assessment Methodology *1-13*
1.5 Community Profile 1-14
1.5.1 Planning Area & Geography *1-14*
1.5.2 Climate *1-18*
1.5.3 Demographics & Vulnerable Populations *1-19*
1.5.4 Economy *1-43*
1.5.5 Development History & Growth Trends *1-46*
Section 2. Planning Process **2-1**
2.1 Organizing Resources 2-4
2.1.1 People & Expertise *2-4*
2.1.2 Public & Stakeholder Engagement *2-16*
2.1.3 Planning Process Library *2-24*
2.2 Assessing Risk 2-29
2.2.1 RAMP (Risk Assessment Mapping Platform) *2-30*
2.2.2 Vulnerability Assessment Methodology *2-31*
2.3 Developing a Mitigation Strategy 2-38

2.3.1 Identify the Problem 2-38
2.3.2 Identify Mitigation Goals 2-39
2.3.3 Conduct Capabilities Assessment 2-40
2.3.4 Develop Mitigation Actions 2-40
2.3.5 MAST (Mitigation Action Support Tool) 2-47
2.4 Adopting & Implementing the Plan 2-47
2.4.1 Monitoring, Evaluating & Updating 2-48
2.4.2 Plan Integration 2-51
Section 3. Risk Assessment 3-1
3.1 Hazard Identification & Screening 3-1
3.1.1 Potential Hazards 3-1
3.1.2 Past Major Hazard Events 3-3
3.2 Hazard Prioritization 3-5
3.2.1 Climate Change Impacts 3-7
3.2.2 Disproportionately Impacted Populations 3-8
3.2.3 County-Wide Priority Hazards 3-9
3.3 Vulnerability to Specific Hazards 3-10
3.3.1 Wildfire Hazard Profile 3-12
3.3.2 Flood Hazard Profile 3-46
3.3.3 Dam Failure Hazard Profile 3-102
3.3.4 Earthquake Hazard Profile 3-130
3.3.5 Slope Failure Hazard Profile 3-166
3.3.6 Drought Hazard Profile 3-188
3.3.7 Severe Weather Hazard Profile 3-210
3.3.8 Extreme Heat Hazard Profile 3-234
3.3.9 Climate Change Hazard Profile 3-252
Section 4. Mitigation Strategy 4-1
4.1 Mitigation Goals 4-1
4.2 Capabilities & Opportunities 4-2
4.2.1 Planning for Hazards & Growth 4-2
4.2.2 Napa County Capabilities & Opportunities Assessment 4-6
4.2.3 Funding Opportunities 4-13

4.3 Translating Strategy to Action 4-17
4.4 County-Wide Mitigation Strategy 4-21
4.5 Mitigation Action Plan 4-24
4.6 Status of Previous Mitigation Actions 4-1

Section 5. Works Cited 5-1

Appendix A. Analysis Methodology A-1

A.1. Natural Hazard Exposure A-2
A.2. Analysis Data A-3
A.2.1. Assets, Value, and Population A-3
A.2.2. Natural Hazard Data A-4
A.2.3. Methodology Overview A-9
A.2.4. Data Dictionary A-10

Appendix B. Process Documentation B-1

List of Figures

Figure ES-1: Napa County Agricultural Preserve xi
Figure ES-2: Geographic Overview of Participating Jurisdictions xii
Figure ES-3: Sea Level Rise Mapping in the Risk Assessment Mapping Platform (RAMP) xv
Figure ES-4: County-Wide Mitigation Strategy Development Exercise xix

Figure 1-1: Napa Firewise Fuel Reduction Project, April 2024 1-12
Figure 1-2: Geographic Overview of Planning Area and Participating Jurisdictions 1-17
Figure 1-3: Napa County 30-Year Monthly Climate Normals (1991-2020) 1-18
Figure 1-4: Napa County Median Household Income 1-24
Figure 1-5: Napa County Poverty Status 1-25
Figure 1-6: Building Stock Ages 1-27
Figure 1-7: Napa County Housing Occupancy 1-28
Figure 1-8: Napa County Dependent Age Groups 1-32
Figure 1-9: Napa County Disabled Elderly 1-33
Figure 1-10: Napa County Race and Ethnicity 1-36
Figure 1-11: Napa County Spanish-Speaking Households 1-37
Figure 1-12: Napa Valley Vineyard 1-38
Figure 1-13: Napa County CDC Social Vulnerability Index 1-42
Figure 1-14: Napa County Population 2011-2022 1-47
Figure 1-15: Parcel Development Density Since 2010 1-49
Figure 2-1: Planning Process Breakdown 2-2

Figure 2-2: Overview of Public and Stakeholder Engagement Timeline 2-18
Figure 2-3: April 2025 Napa Farmers' Market Outreach Event 2-21
Figure 2-4: Online Public Survey Advertisement in Spanish 2-23
Figure 2-5: Napa County Planning Team Breakout Meeting #1.5 (Hazard Prioritization) 2-25
Figure 2-6: County-Wide HMPT Meeting #4 (Strategy Development) 2-27
Figure 2-7: RAMP User Interface 2-31
Figure 2-8: Critical Facilities Point Locations 2-36
Figure 2-9: Data Inputs and Outputs 2-37
Figure 2-10: Hazard Exposure Explanation Graphic 2-38
Figure 2-11: HMGP Timeline 2-50
Figure 3-1: Napa County Federal Disaster Declarations by Hazard Type 1964 to Present 3-4
Figure 3-2: Napa County Hazard Risk Matrix 3-6
Figure 3-3: Historic Large Fires Map 3-27
Figure 3-4: Mean Fire Return Interval (MFRI) Map 3-29
Figure 3-5: Fire Hazard Severity Zones 3-31
Figure 3-6: Exposure Summary – Napa County Wildfire Risk 3-34
Figure 3-7: Napa County Population Exposure to Wildfire 3-35
Figure 3-8: Areas Providing Natural Floodplain Functions in Napa County 3-49
Figure 3-9: Napa County FEMA Flood Risk Exposure Map 3-63
Figure 3-10: DWR Awareness Zones (Dry Creek and Surrounding Area) 3-64
Figure 3-11: DWR 200-YR Awareness Zones (South Napa) 3-65
Figure 3-12: Southern Napa County Levee System 3-67
Figure 3-13: Napa County Repetitive Loss Areas 3-70
Figure 3-14 Howell Mountain Rd. Repetitive Loss Area 3-72
Figure 3-15 Zinfandel Ln Repetitive Loss Area 3-74
Figure 3-16 Yount Mill Rd. Repetitive Loss Area 3-76
Figure 3-17 Ragatz Ln. Repetitive Loss Area 3-78
Figure 3-18 Petra Dr. Repetitive Loss Area 3-80
Figure 3-19 Milliken Creek Repetitive Loss Area 3-82
Figure 3-20 Milton Rd. Repetitive Loss Area 3-84
Figure 3-21: Exposure Summary – Napa County Flood Risk (FEMA) 3-90
Figure 3-22: Napa County Population Exposed to Flood Risk 3-91
Figure 3-23: Napa County Dam Failure Risk Map 3-113
Figure 3-24. Oroville Dam Spillway after 2017 failure. 3-114
Figure 3-25: Exposure Summary – Napa County Dam Failure Risk 3-118
Figure 3-26: Earthquake Faulting 3-130
Figure 3-27: Regional Fault Lines 3-140
Figure 3-28: Napa County Liquefaction Risk 3-141
Figure 3-29: Fault Probability Map for Napa County Area 3-143
Figure 3-30: Napa County Earthquake Risk (M 7.1 Hunting Creek Berryessa Scenario) 3-145

Figure 3-31: Napa County Earthquake Risk (M6.7 West Napa Scenario) 3-146
Figure 3-32: Exposure Summary – Napa County Earthquake Risk (M7.1 Hunting Creek Berryessa Scenario) 3-149
Figure 3-33: Exposure Summary – Napa County Earthquake Risk (M6.7 West Napa Scenario) 3-150
Figure 3-34: Napa County Population Exposure to Earthquake (M6.7 West Napa Scenario) 3-151
Figure 3-35: Napa County Population Exposure to Earthquake (M7.1 Hunting Creek-Berryessa Scenario) ... 3-152
Figure 3-36: Napa County Landslide Susceptibility 3-173
Figure 3-37: Exposure Summary – Napa County Slope Failure Risk 3-177
Figure 3-38: Napa County Population Exposure to Slope Failure 3-178
Figure 3-39: Napa County Drought History and Severity Chart 3-197
Figure 3-40: Napa County Annual Average Wind Speed (Power Class) 3-221
Figure 3-41: Napa County Average Annual Precipitation 3-223
Figure 3-42: Napa County 30-Year Normal Minimum Temperature for January 3-225
Figure 3-43: Day and Night Urban Heat Island Effect Across Natural and Built Landscapes 3-236
Figure 3-44: Napa County 30-Year Normal Maximum Temperature for July 3-242
Figure 3-45: Head Index Classification and Calculation 3-244
Figure 3-46: Predicted Sea Level Rise Map 3-263
Figure 3-47: Exposure Summary – Napa County Sea Level Rise Risk 3-270
Figure 3-48: Napa County Population Exposure to Sea Level Rise 3-271
Figure 4-1: FEMA's Six Mitigation Action Categories 4-17
Figure 4-2: Public Survey Summary 4-19
Figure 4-3: County-Wide Mitigation Strategy Diagram 4-21
Figure 4-4: Mitigation Action Number Key 4-25

Figure A- 1: Hazard Exposure 2
Figure A- 2: Data Analysis Methodology 9

List of Tables

Table ES-1: Adoption Records xxi

Table 1-1: Participating Jurisdictions 1-3
Table 1-2: Participating Jurisdiction Tracker 1-10
Table 1-3: Napa County Population and Households 1-19
Table 1-4: Napa County Income and Poverty 1-23
Table 1-5: Napa County Renter- and Owner-Occupied Housing 1-26
Table 1-6: Napa County Households with Seniors 1-30
Table 1-7: Napa County Households with Children 1-30
Table 1-8: Napa County Population with Disabilities and Access to Transportation 1-31
Table 1-9: Napa County Household Languages 1-35

Table 1-10: Napa County Jobs by Top Industry Sector, 2022 1-44
Table 1-11: Napa County Household Growth Projections 1-51
Table 2-1: County-Wide Steering Group and Planning Team Meetings 2-7
Table 2-2: Napa County Breakout Meetings 2-8
Table 2-3: Members of Steering Group and All Planning Teams 2-9
Table 2-4: Key Stakeholders 2-15
Table 2-5: Consultant Team Members 2-16
Table 2-6: Summary of Community Outreach Media Tools 2-20
Table 2-7: Planning Process Library 2-28
Table 2-8: Napa County Parcel Counts and Values 2-33
Table 3-1: Document Review Crosswalk of Potential County-Wide Hazards 3-2
Table 3-2: Napa County Federal Disaster Declarations 1995 to Present 3-4
Table 3-3: Climate Change Impacts on Hazards 3-8
Table 3-4: County-Wide Hazards Prioritization Summary 3-9
Table 3-5: Wildfires in Napa County 1,000 Acres or Greater, 2015-2025 3-24
Table 3-6: Napa County Population Exposure to Wildfire 3-35
Table 3-7: Napa County Property Exposure to Wildfire 3-37
Table 3-8: Napa County Critical Facilities Exposure to Wildfire 3-39
Table 3-9: Napa County Lifeline Infrastructure Exposure to Wildfire 3-40
Table 3-10: Napa County Wildfire Hazard Problem Statements 3-43
Table 3-11: Flood Hazard Terms 3-47
Table 3-12: Napa County NFIP Status and Flood Insurance Statistics 3-54
Table 3-13: Napa County FEMA Declared Flood Disasters Since 1995 3-59
Table 3-14: Napa County NOAA Recorded Flood Events Since 1995 3-60
Table 3-15: Flood Probability Annually and Over 30-Year Period 3-85
Table 3-16: Summary of Discharges in Napa County 3-87
Table 3-17: Napa County Population Exposed to Flood Risk 3-92
Table 3-18: Napa County Parcels Exposed to Flood Risk 3-93
Table 3-19: Napa County Critical Facilities Exposed to Flood Risk 3-94
Table 3-20:Napa County Lifeline Infrastructure Exposed to Flood Risk 3-96
Table 3-21: Napa County Flood Hazard Problem Statements 3-99
Table 3-22: Dam Hazard Potential Classifications 3-108
Table 3-23: Dams in or Adjacent to Napa County 3-108
Table 3-24: Napa County Population Exposure to Dam Failure 3-119
Table 3-25: Napa County Unincorporated Parcels Exposed to Dam Inundation Zones 3-121
Table 3-26: Napa County Critical Facilities Exposure to Dam Failure 3-123
Table 3-27: Napa County Critical Infrastructure Exposure to Dam Failure 3-124
Table 3-28: Napa County Dam Failure Hazard Problem Statements 3-128
Table 3-29: Moment Magnitude (Mw) Scale 3-131
Table 3-30: Modified Mercalli Intensity (MMI) Scale 3-132

Table 3-31: Modified Mercalli Intensity (MMI) Scale and Peak Ground Acceleration (PGA) 3-133
Table 3-32: Seismic Benchmark Years 3-137
Table 3-33: Earthquakes near Napa County M4.0 or Greater Since 2000 3-139
Table 3-34: 30-Year Probability of Earthquakes in the San Francisco Region 3-142
Table 3-35: Napa County Population Exposure to Earthquake (M6.7 West Napa Scenario) 3-151
Table 3-36: Napa County Population Exposure to Earthquake (M7.1 Hunting Creek-Berryessa Scenario) 3-152
Table 3-37: Parcel Exposure to M6.7 West Napa Earthquake Shake Scenarios 3-154
Table 3-38: Parcel Exposure to M7.1 Hunting Creek-Berryessa Earthquake Shake Scenarios 3-154
Table 3-39: Building Stock Ages and Benchmark Years 3-155
Table 3-40: Critical Facilities Exposure to Earthquake (M6.7 West Napa Scenario) 3-159
Table 3-41: Napa County Critical Facilities Exposure to Earthquake (M7.1 Hunting Creek Berryessa Scenario) 3-160
Table 3-42: Napa County Infrastructure Exposure to Earthquake (M6.7 West Napa Scenario) 3-161
Table 3-43: Napa County Infrastructure Exposure to Earthquake (M7.1 Hunting Creek Berryessa Scenario) 3-161
Table 3-44: Napa County Earthquake Hazard Problem Statements 3-164
Table 3-45: Slope Failure and Storm Records for Napa County Since 2015 3-171
Table 3-46: Slope Failure Susceptibility Classifications 3-172
Table 3-47: Napa County Population Exposure to Slope Failure 3-178
Table 3-48: Napa County Property Exposure to Slope Failure 3-180
Table 3-49: Napa County Critical Facilities Exposure to Slope Failure 3-181
Table 3-50: Napa County Critical Infrastructure Exposure to Slope Failure 3-183
Table 3-51: Napa County Slope Failure Hazard Problem Statements 3-186
Table 3-52: Drought Classifications and Impacts for California 3-197
Table 3-53: Napa County Drought Hazard Problem Statements 3-207
Table 3-54. Severe Weather Events in Napa County, 2015-present 3-215
Table 3-55: Classes of Wind Power 3-219
Table 3-56: Napa County Severe Weather Hazard Problem Statements 3-231
Table 3-57: Cal-Adapt Extreme Heat Terms and Thresholds 3-241
Table 3-58: Heat-Related Illnesses 3-245
Table 3-59: NWS HeatRisk Categories and Related Impacts 3-246
Table 3-60: NWS Heat Forecast Terms and Definition 3-246
Table 3-61: Napa County Extreme Heat Hazard Problem Statements 3-250
Table 3-62: California Agriculture Pests and Diseases 3-255
Table 3-63: Summary of Cal-Adapt Climate Projections for the Bay Area Region 3-267
Table 3-64: Napa County Population Exposure to Sea Level Rise 3-271
Table 3-65: Napa County Parcel Exposure to Sea Level Rise 3-274
Table 3-66: Napa County Critical Facility Exposure to Sea Level Rise 3-275
Table 3-67: Napa County Lifeline Infrastructure Exposure to Sea Level Rise 3-276
Table 3-68: Napa County Climate Change Hazard Problem Statements 3-278

Table 4-1: Napa County Capabilities and Opportunities Assessment 4-9
Table 4-2: Federal, State, and Local Funding Opportunities 4-13
Table 4-3: County-Wide Mitigation Action Plan 4-22
Table 4-4: Napa County Mitigation Action Plan 4-27
Table 4-5: Status of Previous Napa County Mitigation Actions 4-1

Table A-1: Data Dictionary 10

Executive Summary

NAPA COUNTY

Multi-Jurisdictional Hazard Mitigation Plan

Planning Partners

Napa County

Napa County

Municipalities

City of American Canyon

City of Calistoga

City of Napa

City of St. Helena

Town of Yountville

Special Districts

Howell Mountain Mutual Water Company

Napa County Flood Control and Water Conservation District

Napa County Office of Education

Napa Valley College

Napa Valley Transportation Authority

NapaSan

American Canyon Fire Protection District

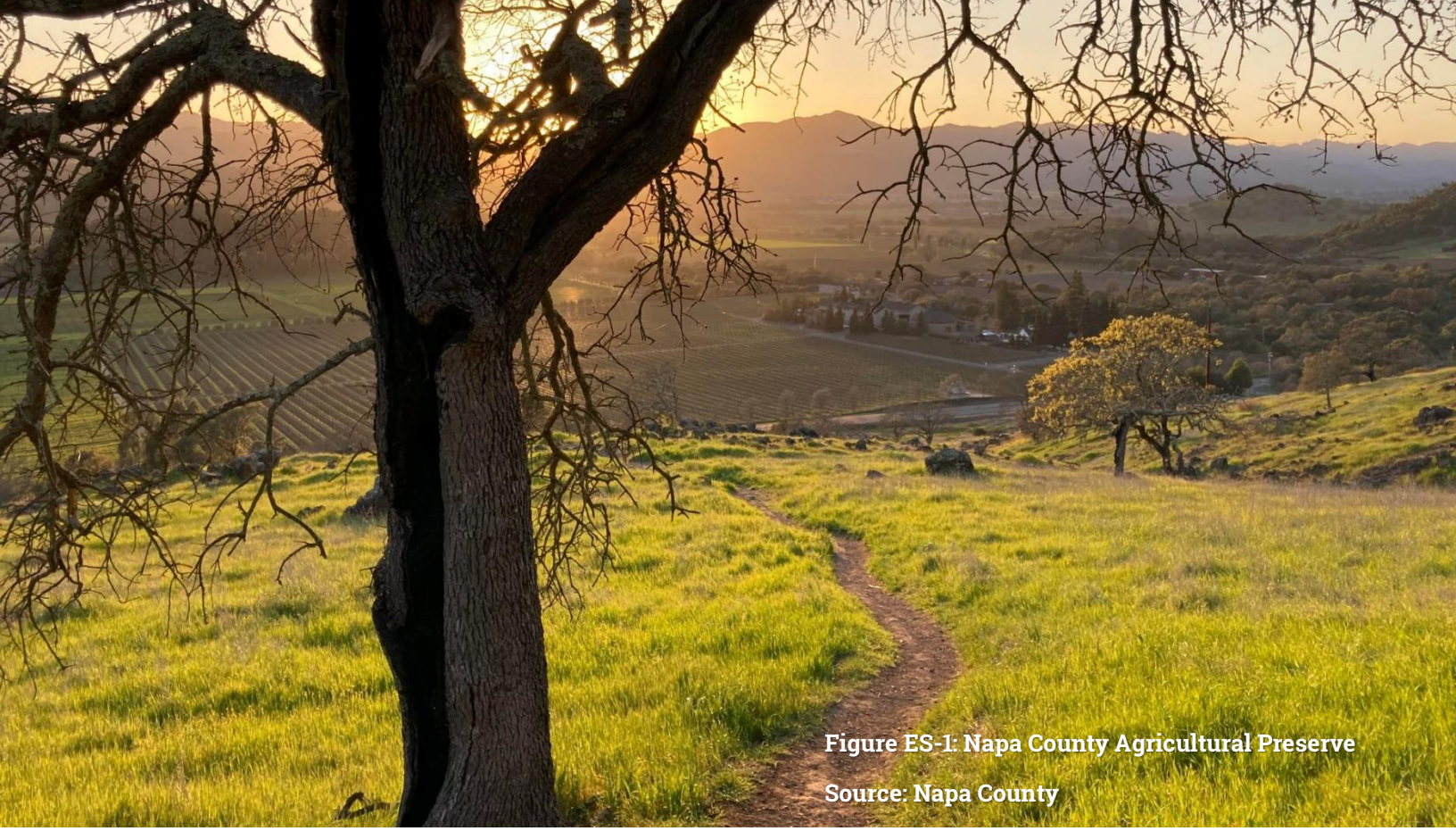


Figure ES-1: Napa County Agricultural Preserve

Source: Napa County

Napa County along with the Cities of Napa, American Canyon, Calistoga, and St. Helena, Town of Yountville, and several special districts and local agencies, together, prepared this Napa County 2026 Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) update to guide officials in protecting the people and property within these jurisdictions' planning areas from the effects of natural disasters and hazard events. This plan demonstrates the participating jurisdictions' commitments to reducing risk from natural hazards through mitigation and serves as a tool to direct decision-makers and available administrative, technical, and financial resources to achieve optimum results. Hazard mitigation planning in Napa County is intended to break the disaster cycle of damage and reactive restoration to baseline by reducing vulnerability to hazards through smart reconstruction and, before a disaster hits, proper planning of future development and critical infrastructure.

The purpose of this MJHMP is twofold. First, it provides resources for the participating jurisdictions and their residents wishing to conduct hazard mitigation efforts by identifying areas of extreme risk and providing financial and technical mitigation resources based on current gaps. Second, it provides these jurisdictions with continued access to grant funding from the state and Federal Emergency Management Agency (FEMA) to conduct hazard mitigation activities.

See Volume 1, Section 1 for a detailed introduction to hazard mitigation planning, an overview of the planning area and participating jurisdictions (Figure ES-2), and the county-wide planning area, community profile, and regulatory environment. Also, see Section 1 for what is new in this updated plan and see Section 2 for planning process details.

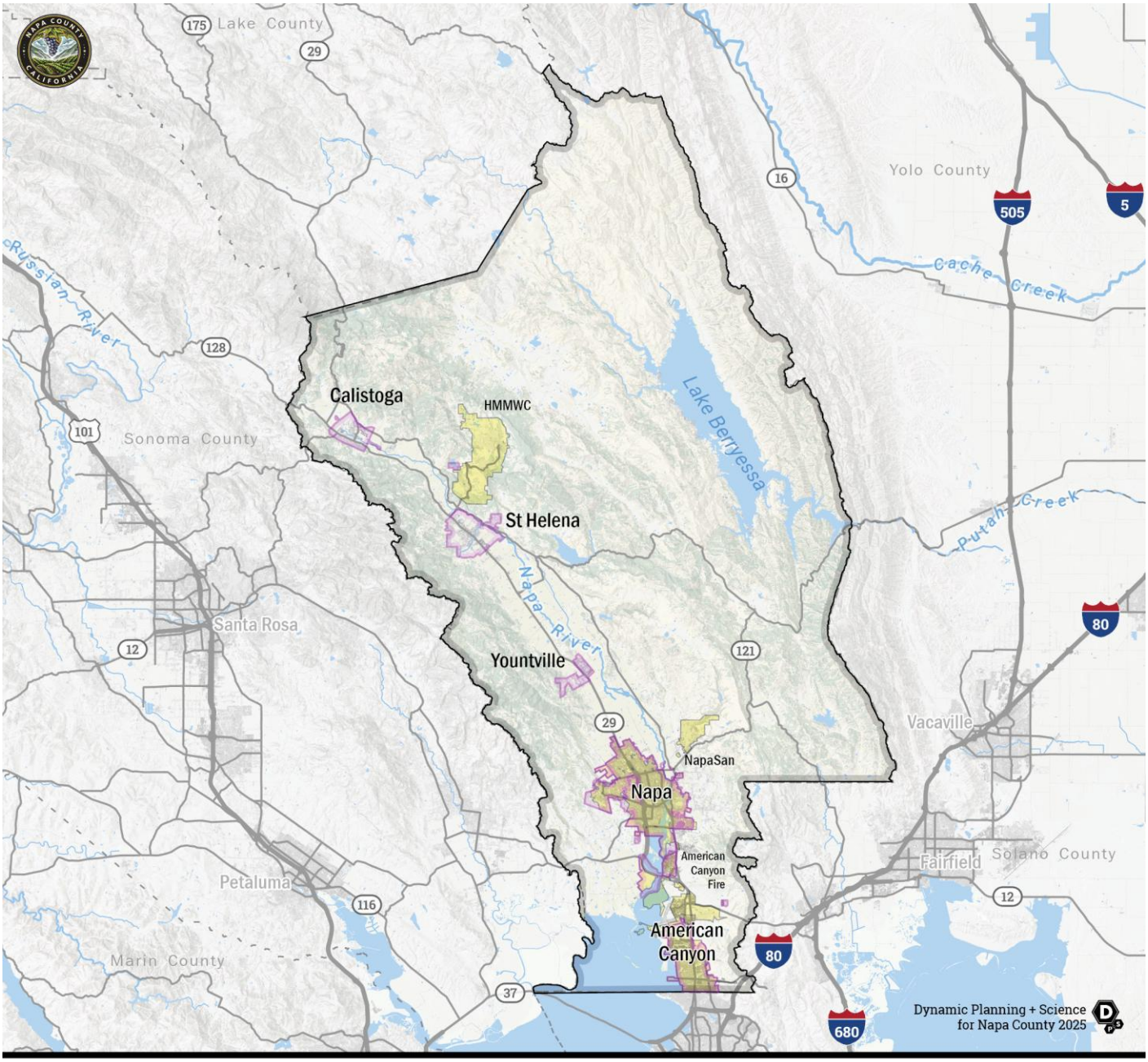


Figure ES-2: Geographic Overview of Participating Jurisdictions

Note: The Napa County Office of Education, Napa County Flood Control and Water Conservation District, and Napa Valley Transportation Authority are county-wide jurisdictions.

Risk Assessment

The risk assessment measures the potential for loss of life, personal injury, economic injury, and property or infrastructure damage resulting from natural hazards to determine vulnerability. For this MJHMP, the risk assessment used new data and technologies that have become available since the previous update in 2020. The participating jurisdictions then used the assessment to rank hazard risks and gauge potential impacts of concern in their planning areas. The risk assessments, located in 0 of Volume 1 and the participating jurisdiction annexes in Volume 2, included hazard identification and profiling; assessment of the impact of hazards on physical, social, and economic assets; identification of areas of vulnerability; additional impacts of each hazard due to climate change; and estimates of the cost of potential damage. As a result, nine natural hazard threats were identified and profiled as county-wide priority hazards.

Natural hazards with spatial boundaries can be analyzed to demonstrate the total population, assets, and properties within each hazard's footprint. At-risk populations, critical facilities and infrastructure, improved parcels of land, and estimated losses for each hazard category are provided in bar chart summary tables throughout this plan to evaluate the percentage of assets exposed to different types of hazards. The side-by-side comparison allows officials to evaluate the impacts of potential hazards to prioritize which hazards and exposed areas to direct energy and financial resources toward mitigation activities.

Each of the hazard-specific profiles includes a vulnerability assessment, as presented in Section 3.3 of Volume 1, with more specific supplemental assessments provided in each jurisdiction's annex in Volume 2. For a more detailed explanation on the risk assessment methods and analysis, see Appendix A. This Executive Summary also provides county-wide exposure summaries on the following pages.

Wildfire
SECTION 3.3.1



Flood
SECTION 3.3.2



Dam Failure
SECTION 3.3.3



Earthquake
SECTION 3.3.4



Slope Failure
SECTION 3.3.5



Drought
SECTION 3.3.6



Severe Weather
SECTION 3.3.7



Extreme Heat
SECTION 3.3.8



Climate Change
SECTION 3.3.9



WILDFIRE EXPOSURE

Exposure to the high and very high fire hazard severity zones

17,058	8,916	$6.7b	567	1,300mi.
People	Parcels	Parcel Structure Value	Critical Facilities	Linear Infrastructure

FLOOD EXPOSURE

Exposure to the 100-year and 500-year FEMA flood zones

20,141	6,802	$2.7b	437	544mi.
People	Parcels	Parcel Structure Value	Critical Facilities	Linear Infrastructure

DAM INUNDATION EXPOSURE

Exposure to the California DWR EAP statewide dam inundation zones

20,654	8,400	$3.4b	440	458mi.
People	Parcels	Parcel Structure Value	Critical Facilities	Linear Infrastructure

EARTHQUAKE EXPOSURE (M6.7 West Napa)

Exposure to the USGS shaking scenario – very strong & severe

118,919	53,637	$32.6b	1,561	2,400mi.
People	Parcels	Parcel Structure Value	Critical Facilities	Linear Infrastructure

EARTHQUAKE EXPOSURE (M7.1 Hunting Creek Berryessa)

Exposure to the USGS shaking scenario – very strong & severe

71,194	35,972	$17.3b	1,060	1,700mi.
People	Parcels	Parcel Structure Value	Critical Facilities	Linear Infrastructure

SLOPE FAILURE EXPOSURE

Exposure to high CGS landslide susceptibility

9,224	2,616	$2.2b	93	368mi.
People	Parcels	Parcel Structure Value	Critical Facilities	Linear Infrastructure

SEA LEVEL RISE EXPOSURE

Exposure to the NOAA 0-6 foot sea level rise zones

3,593	195	$97m	30	147mi.
People	Parcels	Parcel Structure Value	Critical Facilities	Linear Infrastructure



Figure ES-3: Sea Level Rise Mapping in the Risk Assessment Mapping Platform (RAMP)

Mitigation Goals & Strategy

The county-wide Hazard Mitigation Planning Team that worked on this 2026 MJHMP update created a set of goals for the plan based on review of the 2020 Napa County MJHMP, 2017 Napa County General Plan, 2023 California State Hazard Mitigation Plan, and other more current plans of participating, neighboring, and similar jurisdictions. The Planning Team elected to update the goals from the County's 2020 plan based on the previously mentioned documents and in-depth engagement with each participating jurisdiction. The four revised goals serve as the framework for identifying the mitigation strategies included in this plan.



Goal 1: Protect people from loss of life, injury, and economic damage from hazards.

Goal 2: Protect critical facilities, infrastructure, property, and the continuity of essential services from hazards.





Goal 3: Preserve natural resources and ecological functions as hazard mitigation.

Goal 4: Promote community resilience through planning, policies, capital improvements, education, and inter-jurisdictional collaboration.

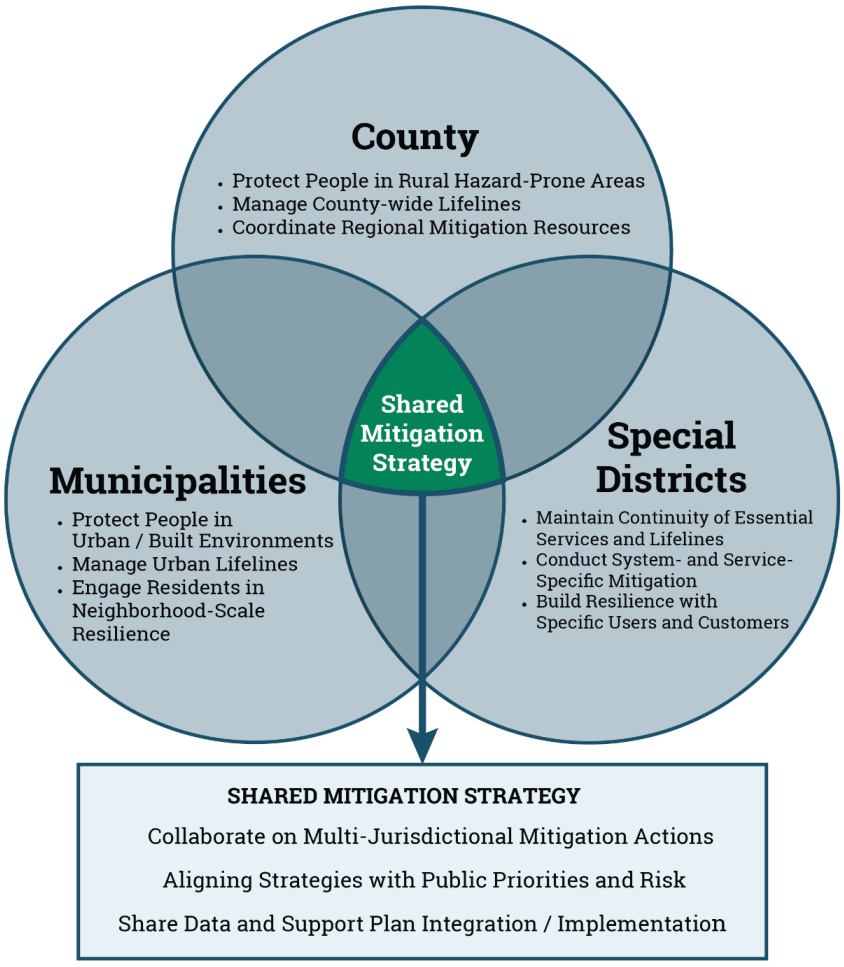


The centerpieces of the mitigation planning process are the mitigation strategy and associated actions designed to reduce or eliminate losses resulting from natural hazards. Mitigation actions are designed to address identified exposure and vulnerabilities and to confer community benefits, including both indirect governmental benefits to protect the overall community and public benefits that will directly support residents, landowners, business owners, and other community members.

By implementing the mitigation actions identified and described herein, Napa County will become more resilient to disasters. These actions may or may not be geared toward grant funding under FEMA's Hazard Mitigation Assistance (HMA) programs; rather, the focus was on the effectiveness in achieving plan goals within the participating jurisdictions' capabilities. The Planning Team identified several new county-wide mitigation actions with far-reaching benefits alongside new and ongoing jurisdiction-specific mitigation actions from previous hazard mitigation plans.

County-Wide Collaboration

In Napa County's mitigation planning framework, the assorted roles of different jurisdiction types—the county, municipalities, and special districts—are structured to reflect their operational scopes and legal authorities. Counties are primarily responsible for coordinating regional strategies and managing risks across large, often rural areas. This includes protecting people in hazard prone unincorporated areas, overseeing lifeline infrastructure like roads and emergency services, and aligning mitigation resources with regional and state goals.



Municipalities, by contrast, manage denser urban environments and wield direct authority over land use and development. Their role centers on reducing risks in the built environment, enforcing urban codes, and engaging residents in neighborhood level resilience strategies. Special districts operate independently from counties and municipalities but play a critical role in maintaining essential services such as water, sanitation, fire protection, and education. Their mitigation responsibilities are system specific and focused on service continuity, infrastructure resilience, and user-centered risk reduction.

All three types of jurisdictions share core responsibilities: collaborating on cross jurisdictional mitigation projects, aligning strategies with public priorities and risk data, and supporting integrated planning and implementation. This operational differentiation ensures a whole community approach that is both targeted and collaborative, in alignment with FEMA's Local Mitigation Planning Policy Guide (2022). The mitigation strategy framework directly informed the structure and diversity of mitigation actions developed since the 2020 MJHMP. The actions identified reflect a balanced approach aligned with each jurisdiction's role and capacity.

2026 Napa County Mitigation Action Plan

Of these, many focus on public education and awareness—critical for engaging residents across urban, rural, and system-specific contexts—and many others target prevention strategies, such as land use policies and regulatory efforts, often led by cities and the county due to their authority over planning and zoning. Structural and property protection actions address vulnerabilities in the built environment and are frequently implemented by cities and special districts managing infrastructure and essential services. Finally, some emphasize natural resource protection, supporting resilience through ecological systems and often led by regional partners and special districts. This distribution demonstrates a whole community mitigation strategy tailored to the roles and responsibilities of each jurisdiction type.

See Volume 1, Section 4 and individual jurisdiction annexes in Volume 2 for details on the individual mitigation strategies in this plan. The county-wide mitigation strategy is presented in Section 4.3.

Mitigation Actions by the Numbers

136 **mitigation actions** have been developed to advance community resilience across Napa County. These actions reflect a comprehensive strategy, addressing a wide range of hazard risks through a variety of projects and programs.

36 are focused on Public Education and Awareness to increase community understanding of hazard risks and preparedness

36 are focused on Prevention to reduce risk through planning and regulatory efforts

75 are focused on Property Protection and Structural Projects that reduce vulnerability through the built environment

43 are focused on Natural Resource Protection to support mitigation through ecological functions.

31 are focused on Emergency Services to maintain essential government functions during a disaster

Plan Implementation

No amount of planning or mitigation can prevent disasters from occurring or eliminate all risks and impacts from such events. Natural hazards will continue to occur, and Napa County and other participating jurisdictions will continue to take actions to reduce the risks these hazards pose to life, property, the environment, and economic prosperity. While this MJHMP identifies opportunities for reasonable mitigation actions by the participating jurisdictions and allied agencies, individuals also have responsibilities to be aware of the potential hazards where they live and to reduce vulnerability within their own household.

Each participating jurisdiction's ability to carry out mitigation is limited to those facilities and areas over which it has authority; they do not have direct authority over neighboring jurisdictions and tribes, other special districts, private utilities and hospitals, or state and federal facilities or infrastructure. Each jurisdiction will focus on actions within its authority while seeking to cooperatively work with other entities in addressing areas of mutual vulnerability and interdependence.

Full implementation and the success of this plan's recommendations will take time and resources; the measure of success will be the coordination and pooling of resources within and among individual jurisdictions and maintaining these successes over time. Teaming together to seek financial assistance at the state and federal level will be a priority to initiate projects that are dependent on alternative funding sources. This plan was built upon the effective leadership of a multi-disciplined Steering Group and a process that relied heavily on public input and support. The plan will succeed for the same reasons.

See Volume 1, Section 2 for details on the implementation and maintenance of this plan.



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Adoption Records

To comply with the Federal Disaster Mitigation Act of 2000 (DMA 2000), the Napa County Board of Supervisors and officials for other participating jurisdictions have officially adopted this Napa County 2026 Multi-Jurisdictional Hazard Mitigation Plan, including Volume 1 in its entirety as well as their respective jurisdictional annex in Volume 2. The adoption of the MJHMP recognizes the jurisdictions' commitment to reducing the impacts of natural hazards within Napa County.

Adoption records for all jurisdictions are summarized in Table ES-1. A copy of Napa County's adoption record is provided on the following pages; other jurisdictions' adoption records are provided in their individual annex in Volume 2.

Table ES-1: Adoption Records

Jurisdiction	Adoption Record	Date of Adoption	Document Reference
Napa County	**Resolution No. XXXXX**	**XX/XX/2026**	**Volume 1, Page X**
City of Napa	Resolution No. XXXXX	XX/XX/2026	Volume 2, Section 1
City of American Canyon	Resolution No. XXXXX	XX/XX/2026	Volume 2, Section 2
City of Calistoga	Resolution No. XXXXX	XX/XX/2026	Volume 2, Section 3
City of St. Helena	Resolution No. XXXXX	XX/XX/2026	Volume 2, Section 4
Town of Yountville	Resolution No. XXXXX	XX/XX/2026	Volume 2, Section 5
Napa County Flood Control and Water Conservation District	Resolution No. XXXXX	XX/XX/2026	Volume 2, Section 6
Napa County Office of Education	Resolution No. XXXXX	XX/XX/2026	Volume 2, Section 7
Napa Valley Transportation Authority	Resolution No. XXXXX	XX/XX/2026	Volume 2, Section 8
Napa Valley College	Resolution No. XXXXX	XX/XX/2026	Volume 2, Section 9
Napa Sanitation District	Resolution No. XXXXX	XX/XX/2026	Volume 2, Section 10
American Canyon Fire Protection District	Resolution No. XXXXX	XX/XX/2026	Volume 2, Section 11
Howell Mountain Mutual Water Company	Resolution No. XXXXX	XX/XX/2026	Volume 2, Section 12

INSERT Napa County adoption record

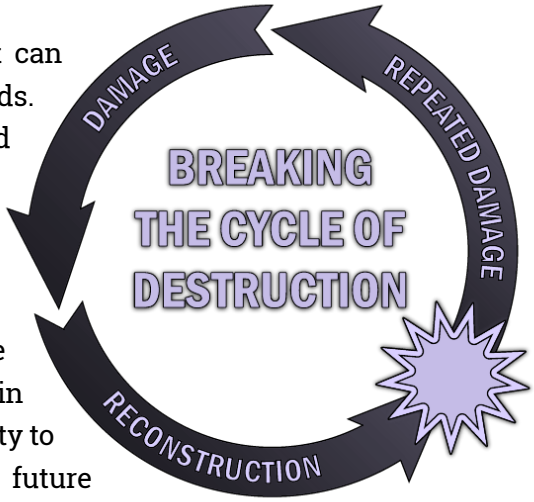
Volume 1

NAPA COUNTY

Multi-Jurisdictional Hazard Mitigation Plan

Section 1. Introduction

The Napa County 2026 Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) involves the participation of multiple local planning partners and geographically covers the entire area within Napa County's boundaries (the "planning area"). This MJHMP was prepared to guide officials in protecting the people and property within Napa County from the effects of natural disasters and hazard events. This plan demonstrates a commitment to reducing risk from natural hazards through mitigation and serves as a tool to direct decision-makers and available administrative, technical, and financial resources to achieve optimum results.



The term "hazard mitigation" refers to actions or strategies that can reduce or eliminate long-term risks caused by natural hazards. Mitigation activities can be developed, planned, and implemented before or after a disaster occurs. After disasters, repairs and reconstruction often are completed in such a way as to simply restore damaged property to pre-disaster conditions. These efforts may return property and infrastructure to "the norm," but the replication of pre-disaster conditions may result in a repetitive cycle of damage and reconstruction. Hazard mitigation planning in Napa County can break this repetitive cycle by reducing vulnerability to hazards through smart construction and proper planning of future development and critical infrastructure.

A planning partnership was formed to develop and steer content in this MJHMP. This partnership consists of Napa County, local city and town governments, special districts, and other agencies who worked together to create the goals, objectives, mitigation strategies and implementation methods to reduce risk to natural hazards that may affect the planning area.

1.1 Participating Jurisdictions

The 2026 Napa County MJHMP encompasses Napa County, all its municipalities, and several other special districts and agencies, collectively referred to as "participating jurisdictions." Any local government or agency with the authority to regulate building or infrastructure development can participate in the hazard mitigation planning process; however, to receive Federal Emergency Management Agency (FEMA) approval, participating jurisdictions must also meet FEMA's planning requirements detailed in the Code of Federal Regulations (CFR). (44 CFR § 201.6 *et seq.*) Throughout the development of this plan, all participating jurisdictions adhered to FEMA's recommended process and fulfilled the necessary requirements for FEMA approval, as outlined in Volume 1 and in the individual jurisdiction annexes of Volume 2.

These participating jurisdictions collaborated to establish goals, objectives, mitigation strategies, and implementation actions aimed at reducing hazard risks across the planning area. The jurisdictions listed in Table 1-1 chose to participate in and complete this plan update process.

Table 1-1: Participating Jurisdictions

Jurisdiction Name	Approximate Population
Local Governments	
Napa County	138,007
City of Napa	78,130
City of American Canyon	21,837
City of Calistoga	5,266
City of St. Helena	5,430
Town of Yountville	3,064
Special Districts and Agencies	
Napa County Flood Control and Water Conservation District	138,007
Napa County Office of Education	18,572
Napa Valley College	4,213
Howell Mountain Mutual Water Company	1,617
Napa Valley Transportation Authority	487,000 trips
Napa Sanitation District	83,300
American Canyon Fire Protection District	21,605

1.2 Purpose & Scope

Each year in the United States, natural disasters take the lives of hundreds of people and injure thousands more. Nationwide, taxpayers pay billions of dollars annually to help communities, organizations, businesses, and individuals recover from disasters. These monies only partially reflect the true cost of disasters because additional expenses incurred by insurance companies and non-governmental organizations are not reimbursed by tax dollars. Many natural disasters are predictable, and much of the damage caused by these events can be reduced or even eliminated.

The primary purpose of this 2026 MJHMP is to guide hazard mitigation planning to better protect the people, property, and assets of Napa County from the effects of natural hazard events, but this MJHMP was also developed to ensure continued eligibility for certain federal disaster assistance. More specifically, the plan meets eligibility requirements for FEMA Hazard Mitigation Assistance (HMA) grants, including the Hazard Mitigation Grant (HMGP), Building Resilient Infrastructure and Communities (BRIC), and Flood Mitigation Assistance (FMA) programs.

Planning Objectives

This plan documents the hazard mitigation planning process the participating jurisdictions used to increase natural hazard resiliency in Napa County, and the effort was initiated for several key purposes. The planning area has significant exposure to numerous natural hazards that have caused millions of dollars in past damages, and the participating jurisdictions want to be proactive in preparing for the probable impacts of future hazard events. Limited local resources make it difficult to implement proactive risk-reduction measures; thus, federal and state financial assistance is paramount to successful hazard mitigation.

The elements and strategies outlined in this plan were carefully selected to best address the participating jurisdictions' specific needs. The following planning objectives collectively aim to enhance resilience, reduce vulnerability, and safeguard the wellbeing of Napa County and its communities against the impacts of natural hazards.

- Meet or exceed Federal Disaster Mitigation Act of 2000 (DMA 2000), California Senate Bill (SB) 379, and other state and federal requirements for hazard mitigation planning.
- Incorporate climate adaptation strategies into hazard mitigation planning.
- Maintain eligibility for funding, enabling the county and participating jurisdictions to continue accessing state and federal grants aimed at mitigating risks.
- Meet the planning requirements of FEMA's Community Rating System (CRS) program, allowing those jurisdictions that participate in CRS to maintain or enhance their classifications.
- Fulfill local, state, and federal requirements by ensuring the plan meets the needs and complies with the regulations of participating jurisdictions, as well as state and federal authorities.
- Coordinate existing plans and programs to ensure synergy among various existing initiatives and programs to prioritize high-impact mitigation projects.
- Conduct a comprehensive risk assessment that focuses on identifying and evaluating the hazards most relevant to the planning area.
- Incorporate and address additional goals and priorities identified through the involvement of community members and other stakeholders.

What is Hazard Mitigation?

Hazard mitigation is a way to reduce or alleviate the loss of life, personal injury, and property damage that can result from a disaster through long- and short-term strategies and is defined by FEMA as "any sustained action taken to reduce or eliminate long-term risk to human life and property from a hazard event." Hazard mitigation activities can be conducted through a wide variety of mitigation strategies such as planning, policy changes, programs, projects, and other activities that can mitigate the impacts of hazards. These activities can be planned and implemented either before or after a disaster occurs. Often, post-disaster repairs and reconstruction restore properties to their pre-disaster state, which may lead to repeated cycles of damage and rebuilding. Studies, including a congressionally mandated independent review, highlight the cost-effectiveness of mitigation activities. On average, every dollar invested in mitigation saves society six dollars in future losses, alongside preventing casualties and injuries. (NIBS, 2019)

Hazard mitigation planning is the process through which hazards are identified, likely impacts determined, mitigation goals set, and appropriate mitigation strategies identified. This MJHMP provides a detailed description of hazards which have the potential to affect the Napa County planning area and also describes the different impacts those hazards may have based on various relationships. The vulnerabilities of both people and property within the planning area are identified based on social and geographic relationships to different hazards, which are referred to as "problem statements" or "areas of concern." Most importantly, the mitigation strategy presented in this MJHMP responds to those identified vulnerabilities and provides prescriptive activities or "mitigation actions" to achieve the greatest risk reduction based on available resources. The county and other participating jurisdictions intend to save lives, reduce injuries, reduce property damage, and protect natural resources for future generations through the mitigation actions identified and described herein.

In Napa County, effective hazard mitigation planning can break this cycle by creating less vulnerable conditions through smart construction, careful planning of future developments, and strengthening critical infrastructure. Additionally, hazard mitigation activities can enhance the safety of residents and infrastructure using various strategies, such as constructing regional flood control projects or reducing fuels around buildings in high wildfire risk areas.

Why Have a Hazard Mitigation Plan?

Enshrined in Public Law No. 106-390 of the United States Code (USC), DMA 2000 mandates that state and local governments develop hazard mitigation plans to qualify for federal disaster grant assistance. (42 USC § 5121 *et seq.*) Before DMA 2000, federal disaster funding primarily focused on post-disaster relief and recovery under the Robert T. Stafford Act, with limited support for proactive hazard mitigation planning. DMA 2000 shifted its focus by prioritizing pre-disaster planning and preparedness.

DMA 2000 encourages collaboration among state and local authorities in pre-disaster planning efforts, emphasizing sustainability in hazard mitigation. Sustainable mitigation involves the responsible management of natural resources and recognizes that hazards and their mitigation strategies must be considered within broad social and economic contexts. By fostering enhanced collaboration and planning networks, DMA 2000 enables local jurisdictions to accurately identify mitigation needs, leading to quicker allocation of funds and more cost-effective projects aimed at reducing risks.

This MJHMP outlines the prevalent hazards in Napa County and examines how these hazards may impact the population and property differently across the planning area. It includes detailed information on natural hazard threats, identifying risks to vulnerable people, property, and assets. The plan's mitigation strategy addresses specific vulnerabilities and prescribes actions aimed at achieving the greatest reduction in these vulnerabilities. This approach ultimately leads to saving lives, minimizing injuries, reducing property damage, and protecting the environment during natural hazard events. Furthermore, the MJHMP ensures participating jurisdictions' ongoing eligibility for federal disaster assistance, specifically FEMA's HMA grants, including programs like the HMGP, BRIC, and FMA.

Why Update the Plan?

Local jurisdictions must maintain an active, approved hazard mitigation plan to pursue funding under the Robert T. Stafford Act. This requirement, established by DMA 2000, mandates that the plan be updated every five years to comply with federal mitigation grant conditions. Federal regulations stipulate that hazard mitigation plans must include a process for monitoring, evaluating, and updating the plan. This update process enables the reassessment of recommendations, the evaluation of completed actions' impacts, and the identification of necessary adjustments to mitigation strategies over time. Compliance with grant requirements hinges on meeting the plan update criteria specified in the CFR.



Napa County's previous MJHMP was last updated and approved by FEMA in 2020. This current plan, comprehensively updated in 2026 to include additional participating jurisdictions, reflects extensive data analysis, public input, and guidance from a multi-disciplinary group of stakeholders. Throughout the planning process, all participating jurisdictions adhered to FEMA's recommended four-step process to develop this 2026 plan update. This comprehensive update includes:

- A complete overhaul and inclusive planning process
- Clear delineation of jurisdictional information
- Development of a new risk assessment
- Reevaluation of goals and objectives
- Creation of new mitigation actions
- New enhancements for implementing mitigation actions
- Updates to all sections of the 2020 plan
- A new project website (mitigatehazards.com/napacountymjhmp) for stakeholder involvement and public information

This thorough approach ensures that the updated plan addresses current risks and mitigation needs effectively.

Who Benefits from this Plan?

The responsibility for hazard mitigation lies with many, including private property owners, businesses and industries, and local, state, and federal governments. Sustainable hazard mitigation includes the sound management of natural resources and recognition that hazards and mitigation must be understood in the broadest possible social and economic context. The enhanced and collaborative planning network called for by DMA 2000 helps local governments articulate accurate mitigation needs, resulting in faster allocation of funding and more cost-effective risk reduction projects.

One benefit of multi-jurisdictional planning is the ability to pool resources and eliminate redundant activities within a planning area that has common risk exposures and vulnerabilities. This plan will help guide and coordinate mitigation activities throughout Napa County.

The 2026 Napa County MJHMP is a cornerstone for enhancing safety and resilience among residents, businesses, and visitors alike; all the community members in Napa County are the ultimate beneficiaries of this plan. By addressing a spectrum of potential hazards, the plan provides a robust framework tailored to the planning area's unique challenges. Public input and stakeholder engagement have been pivotal in shaping the MJHMP, ensuring its relevance and benefit across all sectors. Volume 1 offers comprehensive resources and background information that apply county-wide, while Volume 2 provides tailored specifics for individual jurisdictions within Napa County.

The plan's objectives lay the groundwork for local mitigation activities and partnerships, fostering collaboration and strategic planning. By consolidating resources and coordinating efforts, the MJHMP optimizes the allocation of resources to Napa County's most vulnerable areas. This approach not only enhances efficiency but also amplifies the effectiveness of mitigation efforts, ultimately fortifying community resilience and minimizing the overall impact of natural hazards.

1.3 How to Use This Plan

The Napa County 2026 MJHMP is structured into two volumes to effectively manage elements that apply broadly across the planning area (Volume 1) and those specific to individual jurisdictions (Volume 2). All participating jurisdictions within Napa County adopted Volume 1 in its entirety. Additionally, each jurisdiction has its own specific annex within Volume 2, ensuring that both county-wide and local needs are addressed comprehensively. This structured approach facilitates effective coordination, resource allocation, and implementation of hazard mitigation strategies across the entire planning area.

<table>
<tr><th colspan="2">Napa County</th><th>VOLUME 1
(County-Wide Elements)</th></tr>
<tr><td>City of Napa</td><td>Napa County Flood Control and Water Conservation District</td><td rowspan="7">VOLUME 2
(Jurisdiction-Specific Annexes)</td></tr>
<tr><td>City of American Canyon</td><td>Napa County Office of Education</td></tr>
<tr><td>City of Calistoga</td><td>Napa County Transportation Authority</td></tr>
<tr><td>City of St. Helena</td><td>Napa Sanitation District</td></tr>
<tr><td>Town of Yountville</td><td>American Canyon Fire Protection District</td></tr>
<tr><td>Napa Valley College</td><td>Howell Mountain Mutual Water Company</td></tr>
</table>

Volume 1 Contents

County-Wide Elements: Volume 1 covers all federally required elements of a hazard mitigation plan that apply to the entire planning area. This includes:

- **Section 1 – Introduction:** Describes the overall purpose of the MJHMP, its structure, updates since the last plan, and characteristics of the county-wide planning area.
- **Section 2 – Planning Process:** Details how the plan was developed according to FEMA's four-step process, including stakeholder engagement and public involvement strategies, and outlines procedures for updating and maintaining the plan over time.
- **Section 3 – Hazard Risk Assessment:** Provides an assessment of the natural hazards affecting the entire planning area, including their characteristics and potential impacts.
- **Section 4 – Mitigation Strategy:** Presents mitigation goals, the county-wide and Napa County strategies, and actions aimed at reducing risks and enhancing resilience across the planning area, matched with local capabilities.
- **Section 5 – Works Cited**
- **Appendix A – Analysis Methodology:** Details the methodologies used for hazard and risk assessments.
- **Appendix B – Planning Process Documentation:** Provides documentation of the planning process, including meeting summaries and stakeholder input.

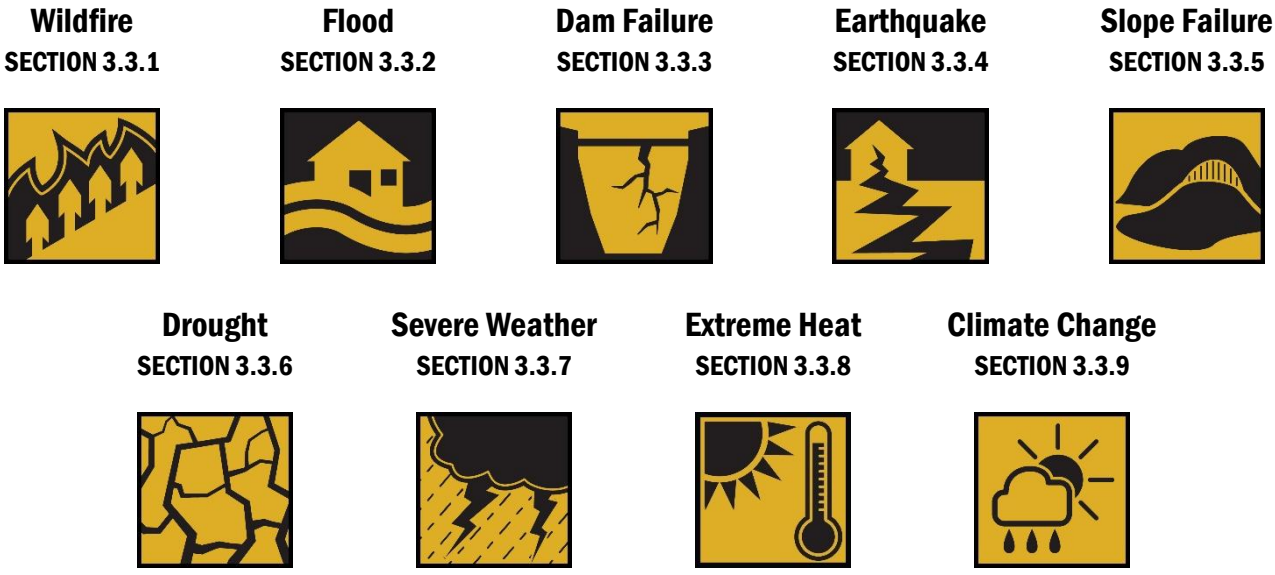
Volume 2 Contents

Jurisdiction-Specific Annexes: Each annex contains detailed information specific to that participating jurisdiction within the planning area, including elements mandated by state and federal regulations for each jurisdiction such as tailored hazard profiles and risk assessments; relevant supporting documentation and maps; jurisdiction-specific mitigation strategies and actions; and implementation schedules and responsibilities.

1.4 What's New

This section offers an overview of the previous hazard mitigation planning efforts for the planning area and highlights the updates made in this 2026 MJHMP. Mitigation actions from the county's 2020 plan, as well as earlier plans from other jurisdictions, were carefully reviewed, updated, and revised to reflect the new priorities established in this update. Only relevant information and accurate data from the earlier plans were incorporated into the current version.

The following sections describe the comprehensive review and update processes undertaken. The 2026 Napa County MJHMP profiles nine county-wide hazards, which are the same as those profiled in the 2020 MJHMP except for pandemic disease.



1.4.1 Background: 2020 vs. 2026

In 2020, Napa County successfully met all approval requirements outlined in DMA 2000, Title 44 CFR § 201.6, and California SB 379 before officially adopted its 2020 MJHMP. This plan has been updated from the earlier plan and incorporated elements from Napa County's 2023 General Plan and other long-range planning mechanisms, as well as those of other participating jurisdictions. Guided by input from hazard mitigation stakeholders, several improvements were implemented for the 2026 update, including:

- **Focused on Priority Hazards:** The hazard mitigation plan stakeholders decided to prioritize natural hazards over human-caused ones for the 2026 update. In particular, pandemic disease was identified as better suited for inclusion in other plans like the Emergency Operations Plan. In addition, this update recognizes recent shifts in severe weather hazard concerns, focusing on heavy rain, high wind, and winter weather as subhazards and increasing emphasis on extreme heat by profiling it separately.
- **Assessed Local Mitigation Progress:** The 2026 update included a review of progress made in local mitigation efforts since the 2020 MJHMP, ensuring continuity and identifying areas for improvement.
- **Enhanced Partnerships:** Strong partnerships among the county, municipalities, and special district and agency partners were reinforced, emphasizing a collaborative approach and county-wide mitigation efforts.
- **Climate Change and FEMA Planning Guidance:** The 2026 MJHMP update has been aligned with the latest California and FEMA guidelines, which emphasize the integration of climate change considerations into hazard mitigation planning. Given the increasing impact of climate change on Napa County and associated hazard risks, the updated plan includes comprehensive strategies to address evolving concerns, ensuring that climate adaptation and resilience measures are equitably prioritized.

These updates reflect a strategic approach to focus resources on the most critical natural hazards facing Napa County while leveraging collaborative efforts and monitoring progress to enhance community resilience and hazard preparedness.

Changes in Participating Jurisdictions

Since adoption of the 2020 MJHMP, the eligibility status of planning partnerships has been monitored throughout the five-year update process by the Napa County point of contact (POC). The determination of partner compliance with participation requirements was based on several criteria:

- Annual submission of progress reports within specified time frames;
- Notification to the POC of any changes in designated points of contact;
- Active participation in group meetings and responsiveness to team needs; and
- Continued support in accordance with expectations outlined in the planning partner expectations package provided at the outset of the process.

Table 1-2 tracks the jurisdictions that participated in the 2020 MJHMP compared to this 2026 update.

Table 1-2: Participating Jurisdiction Tracker

Jurisdiction Name	2020 Participation	2026 Participation
Local Governments		
Napa County	Yes	Yes
City of Napa	No	Yes
City of American Canyon	Yes	Yes
City of Calistoga	Yes	Yes
City of St. Helena	Yes	Yes
Town of Yountville	Yes	Yes
Special Districts and Agencies		
Napa County Flood Control and Water Conservation District	Yes	Yes
Napa County Office of Education	Yes	Yes
Napa Valley College	Yes	Yes
Howell Mountain Mutual Water Company	Yes	Yes
Napa Valley Transportation Authority	No	Yes
Napa Sanitation District	No	Yes
American Canyon Fire Protection District	No	Yes

1.4.2 Mitigation Activities

During the 2026 update process, all mitigation actions from jurisdictions' previous hazard mitigation plans underwent a thorough review to assess their relevance and potential for future implementation. Each action was evaluated based on its feasibility and alignment with current priorities. Some actions were deemed integral to the MJHMP update process or lacked sufficient detail for local implementation, resulting in their exclusion from this update. Additionally, significant changes were made to other mitigation actions based on updated risk assessments, expanded detail, or adjustments to implementation strategies reflecting current practices.

Table 4-5 provides a detailed record of Napa County mitigation actions from the 2020 MJHMP that have been completed, cancelled, or revised, along with explanations for how they were completed, why they are no longer considered relevant, or how they were revised. County mitigation actions that are ongoing or pending from previous MJHMPs and remain pertinent are included alongside newly identified actions in the Mitigation Action Plan (Section 4). Information regarding the status of previous mitigation actions specific to other participating jurisdictions can be found in the relevant Volume 2 annexes.

1.4.2.1 Successes Since 2020

The guiding principles, goals, objectives, and many of the mitigation actions outlined in previous hazard mitigation plans have been effectively implemented through ongoing projects, programs, and planning efforts. These successful mitigation activities have resulted in substantial improvements in reducing hazard risks to life and property, significantly enhancing overall emergency response capacity. This section highlights exemplary policies, programs, and projects specific to Napa County that have achieved notable risk reduction.

Completed county mitigation actions from the 2020 MJHMP are summarized in Table 4-5, providing an overview of the milestones achieved through these efforts. Information regarding completed mitigation actions and successes specific to individual participating jurisdictions can be found in each jurisdiction's annex within Volume 2 of this plan.

Napa Firewise Programs Expansion

Over the past five years, Napa Firewise has led and conducted numerous fuel reduction projects across the county. These projects were often collaborative efforts among multiple public and private agencies, including Napa Firewise, the Napa County Fire Department, the CAL FIRE Sonoma-Lake-Napa Unit, neighborhood associations, and private property owners. The 2021 update of the Community Wildfire Protection Plan (CWPP), which incorporated the risk assessment and mitigation strategy from the 2020 MJHMP, provided new momentum to this work and helped prioritize high-risk areas, leading to historic county investments in community resilience.

Working with funders such as the County, CAL FIRE, and Pacific Gas and Electric Company (PG&E), Napa Firewise has created strategic fuel breaks, protected critical infrastructure, and implemented largescale forest health projects. More recent wildfire events have proved these fuel mitigation strategies in the county to be effective. Further, investments from the Napa Valley Vintners are being used in firefighter response and tactical strategy to re-establish old fire roads.

Napa Firewise uses a treatment-agnostic approach to wildfire mitigation, selecting the right tools for each landscape and long-term goal, ranging from goat grazing to establishing dozer lines (Figure 1-1). This flexibility ensures the greatest ecological benefit and cost-effectiveness while reducing wildfire risk. The Firewise website offers an interactive project dashboard for a transparent view of what projects have been completed, those that are underway, and what is planned for the next two to five years.



Figure 1-1: Napa Firewise Fuel Reduction Project, April 2024

Source: Napa County

1.4.2.2 2020 Plan Integration

Over the past several years, previous hazard mitigation plans were incorporated into other planning mechanisms as a demonstration of progress in local hazard mitigation efforts. Various aspects of the 2020 MJHMP have been used to inform, develop, and update planning mechanisms used by the county and other jurisdictions, such as capabilities assessments and hazard background information, peculiarities, risk mapping, and exposure data. These planning integration efforts are reflected in each participating jurisdiction's capabilities and opportunities assessment.

For Napa County, the following are examples of planning mechanisms into which the 2020 MJHMP was incorporated and of what plan components were used:

- **2021 Napa County Community Wildfire Protection Plan:** The wildfire hazard risk assessment, vulnerabilities, potential impacts, and mitigation actions were incorporated.
- **2023 Napa County General Plan Safey Element:** The 2020 MJHMP risk assessment and mitigation strategy were incorporated by reference, summarized, and used to develop the goals, policies, and implementation measures in the element.
- **2024 Napa County Emergency Operations Plan:** The hazard risk assessment, vulnerabilities, potential impacts, and mitigation strategy were incorporated.

This 2026 MJHMP will be similarly incorporated into local and regional planning documents, such as the general and capital improvement plans for participating jurisdictions. For example, the plan will be referenced in and used to help update the Napa County General Plan Safety Element as well as the Groundwater Sustainability Plan.

Section 4.2 in Volume 1 outlines county planning mechanisms that have been and will be integrated with the MJHMP and the process for such integration in more detail. Each jurisdictional annex in Volume 2 also describes which planning mechanisms that jurisdiction has been integrating and will integrate with the updated plan, as part of its capabilities and opportunities assessment.

1.4.3 New Analysis & Risk Assessment Methodology

Napa County strengthened this plan by using new research methods and web-based information systems. Geographic Information Systems (GIS) mapping and analysis provided participating jurisdictions with the tools to develop more comprehensive data sets than those used in previous planning efforts. A web-based mapping tool, called the Risk Assessment Mapping Platform (RAMP), was used to assist and engage the planning teams in this analysis through a highly interactive approach. In addition, an application called the Mitigation Action Support Tool (MAST) was also used to record, update, and track described vulnerabilities (referred to herein as "problem statements" or "areas of concern") and to create associated mitigation actions. See Sections 2.2 and 2.3 for more information about the new analysis and risk assessment methodology used in developing the mitigation strategy, including RAMP and MAST.

1.5 Community Profile

The community profile for Napa County establishes the foundation for assessing risks and vulnerabilities across the planning area. By pairing the hazard-specific vulnerability assessments (Section 3.3) with local geography, demographic characteristics, and economic conditions, mitigation strategies and actions can be more effectively directed toward key populations and areas. The Hazard Mitigation Planning Team reviewed geographic and demographic data as part of the risk prioritization and assessment process. This comprehensive approach ensures that mitigation efforts are tailored to address the most critical vulnerabilities and enhance the resilience of the community.

1.5.1 Planning Area & Geography

The 2026 Napa County MJHMP geographically covers the entire 788-square-mile area within the county's boundaries (the "planning area") and includes all municipalities within the county as well as several special districts and governmental agencies. Napa County is located in the Governor's Office of Emergency Services Coastal Region and Mutual Aid Region II. Nearly 60% of the county's population resides within the City of Napa, the county seat and largest municipality which lies in the Napa Valley, while remaining reside in other incorporated cities or towns or in unincorporated areas. Figure 1-2 provides an overview of the planning area and participating jurisdictions.

Napa County is located in the North Bay Area of California, north of San Pablo Bay and 50 miles north of San Francisco. It is one of the nine San Francisco Bay Area counties and one of four North Bay counties. Contiguous counties include Solano, Sonoma, Lake, and Yolo. The county is nestled among the Mayacamas Mountains to the north, the Vaca Mountains to the east, and the Napa River Delta to the south and west. The county features a varied geography composed of fertile valley floors, rolling hills, and rugged uplands.

The southern part of the county, which includes the City of Napa and American Canyon, lies at lower elevations and experiences a milder Mediterranean climate. In contrast, the northern and eastern areas—including Angwin, Calistoga, and Lake Berryessa—are more mountainous, with cooler temperatures, dense woodlands, and higher elevations.

Napa County is home to a mix of land ownership types. While much of the county is privately owned—dominated by vineyards, rangelands, and rural residential properties—significant areas are managed by public agencies such as the Bureau of Land Management (BLM), California Department of Parks and Recreation, and the U.S. Bureau of Reclamation, which oversees Lake Berryessa and surrounding lands. The county encompasses several incorporated communities, including the cities of Napa, American Canyon, Calistoga, St. Helena, and the Town of Yountville, along with unincorporated areas such as Angwin, Pope Valley, and Berryessa Highlands. These diverse landscapes and communities form the foundation of Napa County's unique character and planning area.

Major Transportation Routes

Understanding transportation routes in the planning area is crucial for hazard mitigation planning. Several key roads in Napa County provide important linkages and access during a hazard event, including functioning as critical evacuation routes.

State Route 29 (SR-29) is the primary state highway running north/south through the Napa Valley. SR-29 is four-lane divided expressway through American Canyon before transitioning to a freeway in the City of Napa and then returning to a four-lane divided expressway between northern Napa and Yountville. SR-29 is a two-lane undivided highway from Yountville to the Napa County-Lake County boundary. SR-29 is also a vital regional connector between Napa and Lake County in the north and Solano County in the south. State Route 12 (SR-12), State Route 121 (SR-121), State Route 128 (SR-128), and State Route 221 (SR-221) provide some redundancy with SR-29.

SR-12 serves as a regional east/west connection between Interstate 80 in Solano County and U.S. 101 in Sonoma County. SR-12 is a four-lane divided expressway from the Napa County/Solano County boundary to west of the City of Napa, where it transitions to a two-lane undivided highway. SR-12 runs coterminous with SR-29 from the Napa County Airport to the Stanly Ranch.

SR-121 begins at SR-128 near Lake Berryessa and continues southwest through the Wooden Valley to the City of Napa. In the City of Napa, SR-121 connects to SR-221 and continues west to SR-29. SR-121 runs coterminous with SR-29 to the Stanly Ranch, where it then joins SR-12 and continues west into Sonoma County. SR-121 is primarily a two-lane undivided highway; however, it does have four-lane divided sections within the City of Napa.

SR-128 enters Napa County at Lake Berryessa and the two-lane undivided highway meanders through the Capell Valley and Sage Canyon before reaching the Napa Valley. SR-128 joins SR-29 at Rutherford and continues north to Calistoga, where they diverge. SR-128 continues north into the Knights Valley where it enters Sonoma County.

SR-221 is a short two-lane divided expressway that links Soscol Junction (SR-12/SR-29) with SR-121 in the City of Napa.

In addition, Napa County contains an extensive network of city- and county-maintained roads that are critical for intra-county travel and emergency response. These roadways connect residential neighborhoods, agricultural areas, businesses, and essential infrastructure such as hospitals, schools, and public safety facilities.

Rail transportation consists of freight service provided by the California Northern Railroad. The short line railroad is based at Lombard Yard in American Canyon and serves local industries in southern Napa County and Solano County. The California Northern interchanges freight cars with the Union Pacific Railroad in Suisun City. The Napa Valley Wine Train offers roundtrip excursion passenger rail service between Napa and St. Helena. There is no scheduled passenger commuter rail service in Napa County.

Napa County Airport (APC) is the only general aviation airport in Napa County. Located in unincorporated Napa County between the City of American Canyon and the City of Napa, APC occupies 824 acres and features three runways ranging from 2,510 to 5,931 feet in length. The airport's facilities include a control tower, approximately 200 hangars, approximately 160 aircraft tie down spaces, and a helicopter pad. There is no scheduled commercial passenger service at APC.

Angwin Airport, or the Angwin-Parrett Field, is a single runaway airport owned and operated by the Pacific Union College. The airport is primarily used by students of the university aviation program, but is also available to members of the community. In 2006, the university sought to sell the airport to Napa County, but the plan never went through.

These transportation modes and routes are pivotal for emergency response, evacuation planning, and general transportation needs outlined in this MJHMP. Figure 1-2 provides a geographic overview of the planning area and highlights major transportation routes.

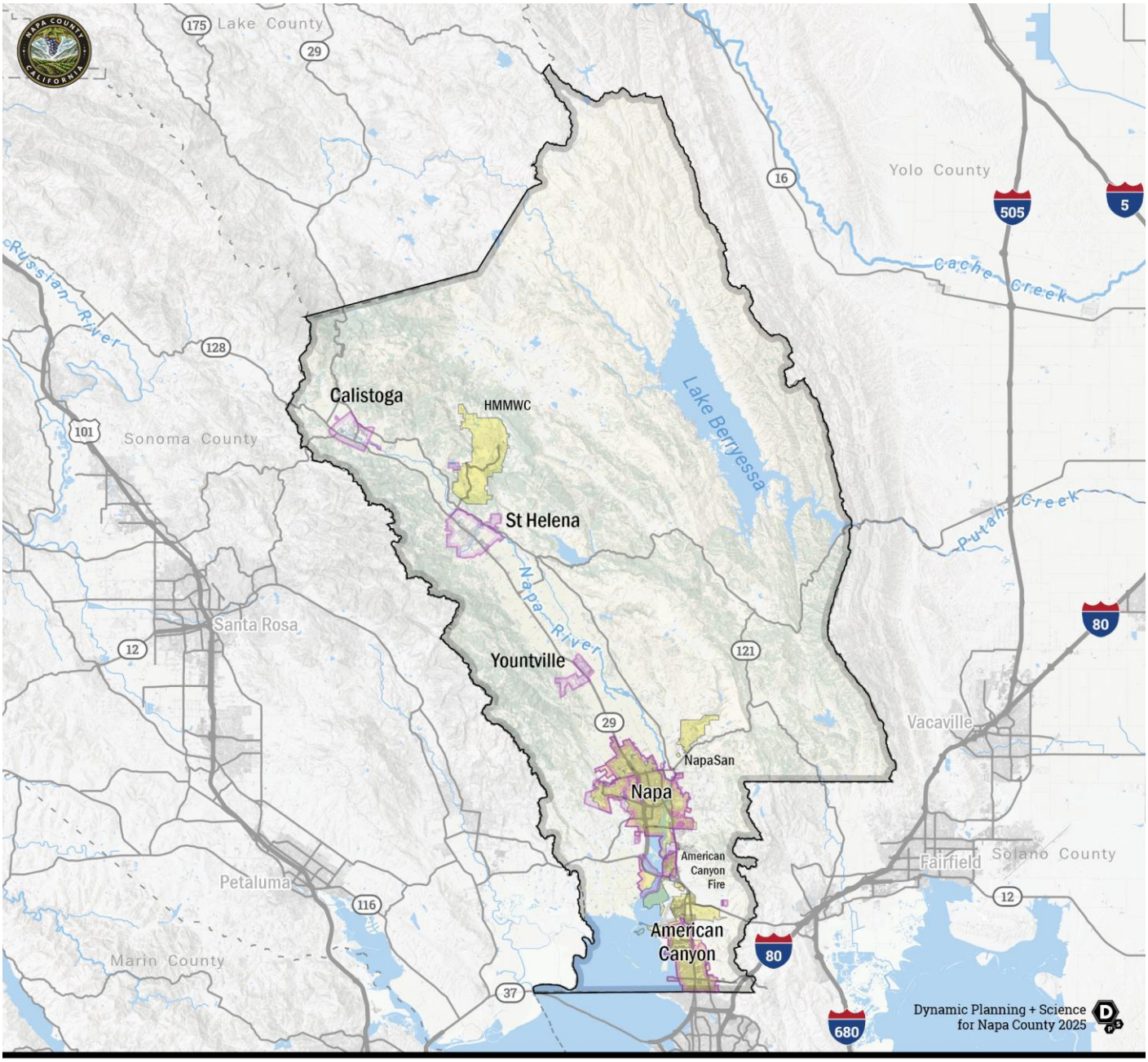


Figure 1-2: Geographic Overview of Planning Area and Participating Jurisdictions

Note: The Napa County Office of Education, Napa County Flood Control and Water Conservation District, and Napa Valley Transportation Authority are county-wide jurisdictions.

1.5.2 Climate

The general climate of Napa County can be described as Mediterranean, with cool, wet winters and warm, dry summers. It varies slightly across the county due to terrain and geography. For example, the southern end of the valley, where American Canyon and the City of Napa are located, is cooler than the northern part of the county due to its location near San Pablo Bay (the northern tip of the San Francisco Bay). Winds from the bay cool southern Napa County as far north as Yountville. The St. Helena and Calistoga areas do not encounter those cooling winds and thus tend to be much warmer.

Average annual precipitation in Napa County is around 30 inches, with over half occurring in the winter months between December and March. The western side of the valley, in the Mayacamas Mountains, gets more rain and supports redwood and fir forests and numerous water bodies and features. The eastern side of the valley, in the Vacas Mountains, receives much less rain and has desert-like characteristics with scrub brush and cactus. Temperatures in Napa County typically range from a winter low of around 39 degrees Fahrenheit (°F) to a summer high approaching 90°F.

Figure 1-3 presents the county-wide 30-year monthly climate normals from 1991 to 2020 for precipitation and minimum and maximum temperatures.

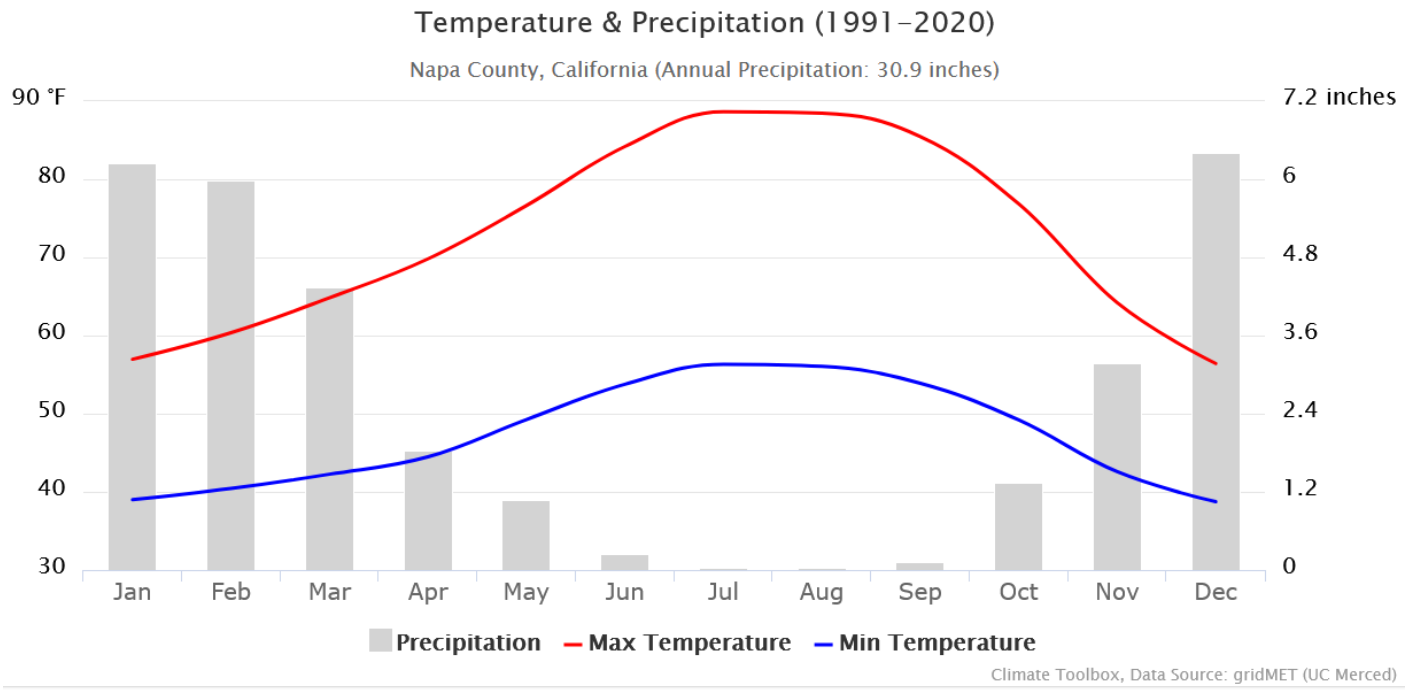


Figure 1-3: Napa County 30-Year Monthly Climate Normals (1991-2020)

Source: gridMET (UC Merced)

1.5.3 Demographics & Vulnerable Populations

This section describes the demographic characteristics of Napa County to guide hazard mitigation planning efforts. Natural disasters affect communities both physically and socially, with demographic composition playing a central role in determining how impacts are distributed, particularly among vulnerable groups facing greater challenges in preparedness, response, and recovery. Understanding the planning area's social and economic landscape also helps assess potential social costs from infrastructure damage, including housing, industry, public facilities, essential services, and transportation.

The demographic data for Napa County and the other participating jurisdictions discussed in this MJHMP is derived from the U.S. Census Bureau's American Community Survey (ACS) spanning from 2017 to 2022. It may differ from figures in other regional studies or plans due to inherent data variability, especially in rural areas and at the block group level, which is available as spatial data files but not in standard Census tabulations. The figures presented are intended to highlight broader regional trends relevant to hazard mitigation planning efforts rather than inform specific decision-making or administrative actions.

According to the ACS, Napa County had a total estimated population of 252,300 in 2022, representing a slight decrease overall since 2020 according to the Demographic Research Unit (DRU) of the California Department of Finance. (DRU, 2026) Based on the most recent Census data, approximately 54% of Napa County's residents live in unincorporated areas. The largest incorporated jurisdiction is the City of Napa, with about 31% of the population. However, the fastest growing area of the county is in and around the City of American Canyon, at a rate of almost 3% between 2024 and 2025. (*Id.*)

Average household sizes vary across the county, with the smallest in the Town of Yountville and largest in the City of American Canyon. This trend generally follows the gradient of population densities, with household sizes decreasing as one moves north up the Napa Valley, away from the Bay Area and toward more rural areas of the county.

Table 1-3 summarizes populations and household sizes for Napa Count, including the unincorporated county and participating incorporated municipalities.

Table 1-3: Napa County Population and Households

Area	Population	Households	Avg. HH Size
Napa County (Unincorporated)	**137,384**	**55,588**	**2.40**
American Canyon	21,669	5,924	3.64
Calistoga	5,191	2,330	2.20
Napa (City)	79,233	31,666	2.47
St. Helena	5,426	2,963	1.81
Yountville	3,397	1,824	1.45

Source: ACS 5-Year, 2017-2022

1.5.3.1 Introduction to Vulnerable Populations

Exploring local demographic data is crucial for identifying groups and geographic areas vulnerable to hazard events. Certain populations face heightened risks following disasters due to factors such as age, economic status, mobility limitations, physical or mental disabilities, and geographic location. Vulnerability is not static; individuals may be more at risk from some hazards than others. For instance, a low-income family without transportation may struggle during rapid evacuations for wildfires or floods but could be adequately prepared for an earthquake event. Mitigation efforts can reduce personal vulnerability for some but not all individuals, especially those reliant on caregiving networks like children, the elderly, and persons with disabilities. Further, environmental risk often disproportionately burdens lower-income and marginalized communities, who typically reside in hazard-prone areas with fewer mitigation resources. (National Center for Disaster Preparedness, 2020)

In all-hazards preparedness and response planning, at-risk individuals, often synonymous with vulnerable populations, are federally defined as "children, pregnant women, senior citizens, and others with access or functional needs during public health emergencies." (42 USC § 2802(b)(4)(B)) These include those who are economically disadvantaged, have chronic medical conditions, belong to historically marginalized groups, face language barriers, lack transportation, or experience homelessness. Prioritizing resources where they are most effective, such as cost-sharing for wildfire or flood mitigation measures and translating emergency information into languages needed by the local community, are prime examples of planning for vulnerable populations in hazard mitigation.

At-Risk Individuals with Access & Functional Needs

Access and functional needs may interfere with the ability for an at-risk individual to access or receive medical care before, during, or after a disaster or emergency event. Irrespective of a specific diagnosis, status, or label, the term “access and functional needs” (AFN) refers to a broad set of cross-cutting access-based or function-based needs, generally distinguished according to the following:

- **Access-based needs** require that resources are accessible to all individuals to maintain health, such as social services, accommodations, information, transportation, and medications.
- **Function-based needs** refer to restrictions or limitations an individual may have that requires assistance before, during, and after a disaster or public health emergency.

At-risk individuals may have additional needs that must be considered in planning for, responding to, and recovering from a disaster or emergency. An approach recommended by the U.S. Department of Health and Human Services (HHS) for integrating the access and functional needs of at-risk individuals is to consider elements based on the “CMIST” framework:

- **C = Communication:** Individuals with communication needs may have limitations that interfere with the receipt of and response to information, requiring information to be provided in an appropriate and accessible format. This can include individuals who are deaf or hard of hearing, speak American

Sign Language, have limited or no English proficiency, are blind or have low vision, or have cognitive or physiological disabilities.

- **M = Maintaining Health:** Individuals may require specific services, supplies, equipment, medication, or nutrition to reduce negative impacts of a disaster or emergency and maintain activities of daily living, such as breathing, eating, dressing, grooming, transferring, and toileting.
- **I = Independence:** Continuity of access to necessary assistive devices, such as wheelchairs, or other aids, like service animals, is crucial to maintaining independence for individuals who rely on these support tools to function autonomously.
- **S = Support:** Tailored, person-centered support may be necessary for individuals who have lost caregiver assistance, find it difficult to cope in a new or strange environment, have difficulty remembering or understanding, or have past trauma experiences. This includes support for victims of abuse, individuals with behavioral health needs, or those who have psychiatric conditions (e.g., Alzheimer's disease, Schizophrenia).
- **T = Transportation:** Individuals may lack access to personal transportation due to a variety of factors, including economic status, age, physical or mental disability, temporary condition or injury, or legal restriction. This requires coordination with mass transit and accessible transportation service providers to ensure access to support and necessary services. (HHS, 2020)

While most individuals with access and functional needs do not have acute medical conditions requiring the support of trained medical professionals, many require additional assistance to maintain health and minimize preventable negative outcomes, especially during a disaster event. These at-risk individuals may also require more time or personnel to assist during an evacuation. Therefore, special attention from planners and emergency managers is crucial for this highly vulnerable population.

Environmental Justice

Environmental justice issues can often exacerbate public health impacts from hazard events, and vice versa. The U.S. Environmental Protection Agency (EPA) defines environmental justice as the "fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies" (EPA, 2021).

As previously discussed, hazard events can disproportionately impact low-income and vulnerable populations. Lower-income populations, for instance, are more likely to live in neighborhoods susceptible to flooding or near industrial areas or hazardous waste sites, increasing their risk to toxic leaks associated with flood and storm damage (Sherwin, 2019). With the increased frequency of wildfires in recent years, populations already living in air quality-impacted areas can be further affected by wildfire smoke. These populations often include agricultural and outdoor workers, children, seniors, and low-income residents who experience disproportionate health impacts from wildfire smoke, as well as other impacts from wildfires such as physical and psychological stress from evacuation, property loss, physical injury, or death (Shahir Masri et al., 2021)

Certain locations within Napa County are known to be at higher risk of hazard-related impacts to vulnerable populations. For example, communities near the Napa River, including parts of the City of Napa and surrounding unincorporated areas, are at elevated risk of flooding. Low-income households in these flood-prone zones may lack the financial resources necessary for effective mitigation and post-disaster recovery. The hilly and mountainous regions in the eastern and northern parts of the county—particularly those with dense vegetation and limited road access—face significant wildfire risk. This includes areas near Lake Berryessa, Angwin, and the surrounding wildland-urban interface. Vulnerable populations, such as older adults, individuals with disabilities, and those with limited access to transportation, may experience greater difficulty evacuating and recovering from wildfire events. Additionally, areas where urban development borders undeveloped or agricultural land are susceptible to multiple hazards, including wildfire, flooding, and severe weather. Residents in these transitional zones may represent a range of socioeconomic backgrounds, with some lacking the means or support systems needed for adequate disaster preparedness.

It is vital that environmental laws and regulations, as well as hazard mitigation planning, meaningfully include these communities in their efforts to account for public health and safety. This approach ensures that vulnerable populations are not overlooked and that their specific needs and risks are addressed comprehensively.

Mental Health Impacts of Hazard Events

Hazard events are associated with many physical impacts on people and property, but they can also have mental health impacts. Specifically, hazards can precipitate anxiety, depression, shock, extreme stress, or Post Traumatic Stress Disorder (PTSD). (Makwana, 2019) Mental health challenges can also result from ongoing impacts after a disaster event, such as socioeconomic losses from damage to housing resulting in displacement. And, of course, the death or injury of a loved one can lead to substantial psychological stress as well. (*Id.*)

Napa has also experienced the trauma impacts in major disaster recovery, especially in the aftermath of the LNU Complex fires in August 2020 that burned almost half of the county and were followed by the devastating Glass Fire in September of the same year. (Napa Firewise, 2021) There is a clear need to ensure that the County and other participating jurisdictions provide trauma informed training for staff in support of disaster recovery victims in the future.

1.5.3.2 Income & Housing

Economic status and mobility strongly predict hazard vulnerability. Low-income households and communities bear disproportionate financial burdens from the costs associated with disaster preparedness, response, and recovery. In the United States, households are expected to rely on private resources to prepare for, respond to, and recover from disasters, placing those in poverty at a distinct disadvantage. Moreover, economically disadvantaged households are more likely not to own their homes and frequently inhabit poorly constructed or inadequately maintained housing.

Disasters often result in unexpected expenses that can push families and individuals living on the brink of poverty or homelessness over the edge. Low-income residents are at significantly higher risk of injury and face greater challenges securing food and shelter during and after an event. Further, those lacking transportation may find it impossible to evacuate during an emergency, while recovery costs can be prohibitively high for households unable to afford hazard mitigation measures in advance. (Krause & Reeves, 2017) Renters and low-income residents are also less likely to purchase insurance, leaving them particularly vulnerable to significant losses during hazard events.

According to ACS data, the median household income in unincorporated Napa County was near $106,000 in 2022, with incorporated areas ranging from about $75,000 in Yountville to almost $136,000 in St. Helena. Similarly, the county poverty rate is just under 8% while Yountville's rate exceeds 10% and St. Helena and Calistoga are less than 6%. These distributions generally follow a pattern of rural and urban areas being lower income and suburban areas being higher income. The lowest incomes and highest concentrations of poverty are located in southern City of Napa, northern City of American Canyon, and the unincorporated county in between, as well as in the Yountville area and Census Tract surrounding Lake Berryessa in the northeast corner of the county.

Table 1-4, Figure 1-4, and Figure 1-5 illustrate the distributions of median household income and poverty rates across the county. While income is a key economic indicator, it may not fully capture household wealth or financial resilience, particularly in areas with high housing costs as seen throughout Napa County and limited access to resources.

Table 1-4: Napa County Income and Poverty

Area	Median Income	Poverty Rate
Napa County (Unincorporated)	**$105,809**	**7.9%**
American Canyon	$122,694	7.4%
Calistoga	$96,667	5.4%
Napa (City)	$100,273	8.1%
St. Helena	$135,781	5.7%
Yountville	$75,134	10.6%

Source: ACS 5-Year, 2017-2022

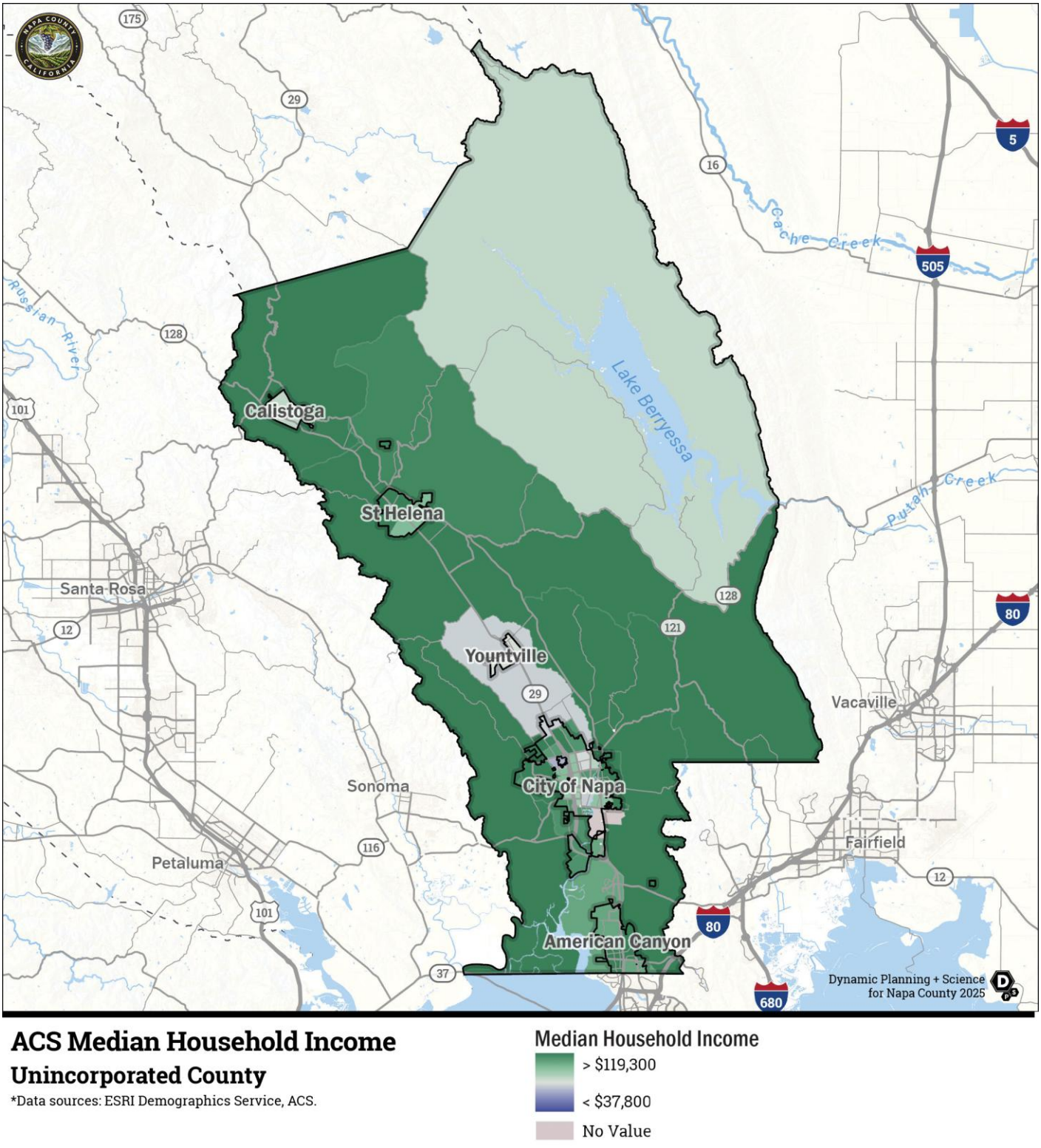


Figure 1-4: Napa County Median Household Income

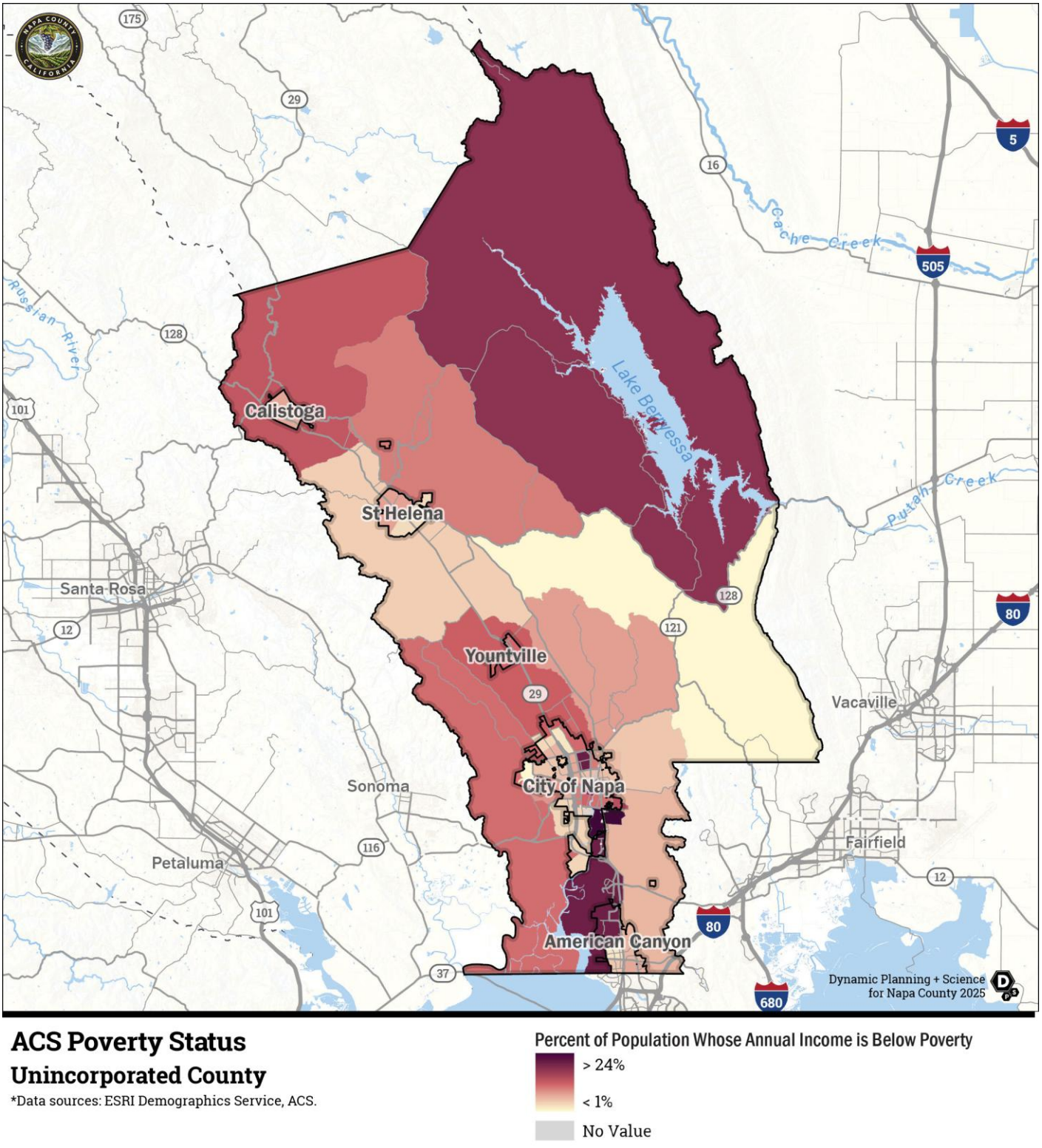


Figure 1-5: Napa County Poverty Status

Renters face additional challenges beyond being less likely to have personal property insurance. Decisions about major structural improvements typically rest with property owners, not tenants, and low-income renters may inhabit older, less resilient homes located in areas with greater exposure to hazards. For instance, mobile homes are more susceptible to damage from severe weather and floods compared to other types of residences, while aged homes may lack air conditioning or cooling units needed during heatwaves. Federal disaster recovery services can widen disparities between renters and homeowners, as homeowners generally receive higher payouts through FEMA's Individual Assistance (IA) program. Research spanning 1999 to 2013 indicates that homeowners' wealth tends to increase after local hazard events, while renters' wealth typically decreases. (Howell & Elliot, 2019)

In 2022, Napa County had an overall homeownership rate of approximately 67% according to ACS data, which is higher than the state and national averages. Approximately 35% of occupied housing units in the unincorporated county are renters, which is similar to the percentage of renters in most other jurisdictions except for the City of Napa, which has a slightly higher rate as the largest population center, and the City of American Canyon which has a much lower rate of renters at just over 20% (Table 1-5).

Table 1-5: Napa County Renter- and Owner-Occupied Housing

Area	Total Occupied Housing Units	Renter	Rent %	Owner	Own %
Napa County (Unincorporated)	**49,218**	**17,142**	**35%**	**32,076**	**65%**
American Canyon	5,725	1,205	21%	4,520	79%
Calistoga	2,116	776	37%	1,340	63%
Napa (City)	29,443	12,052	41%	17,391	59%
St. Helena	2,466	792	32%	1,674	68%
Yountville	1,516	514	34%	1,002	66%

Source: ACS 5-Year, 2017-2022

Age of Building Stock

The age of buildings in Napa County has direct implications for hazard vulnerability and resilience. Data from the County Assessor's Office (Figure 1-6) shows that a significant portion of building stock across the county was built before the 1980s, prior to many of California's modern building code requirements for seismic safety, energy efficiency, and wildfire resilience. The City of American Canyon is the exception, with approximately 45% of its building stock constructed after 1990.

Overall, this distribution means that many homes were constructed before the 1997 Uniform Building Code (UBC) overhaul, which introduced strength-based seismic design, soil amplification factors, and near-source effects. California had already unified its building standards under Title 24 (1978), but homes built in the late 1970s and 1980s still predate the most rigorous seismic provisions later adopted into the California Building Code (CBC) from the International Building Code (IBC). Similarly, widespread requirements for fire-resistant materials and defensible space did not emerge until after major wildfire losses in the 1990s and 2000s.

The condition and age of buildings, and especially housing stock, highlight the importance of encouraging voluntary retrofits for older structures, maintaining critical lifelines in aging neighborhoods, and ensuring rental housing—which is often concentrated in older buildings—receives adequate investment to remain safe and habitable after disasters.



Figure 1-6: Building Stock Ages

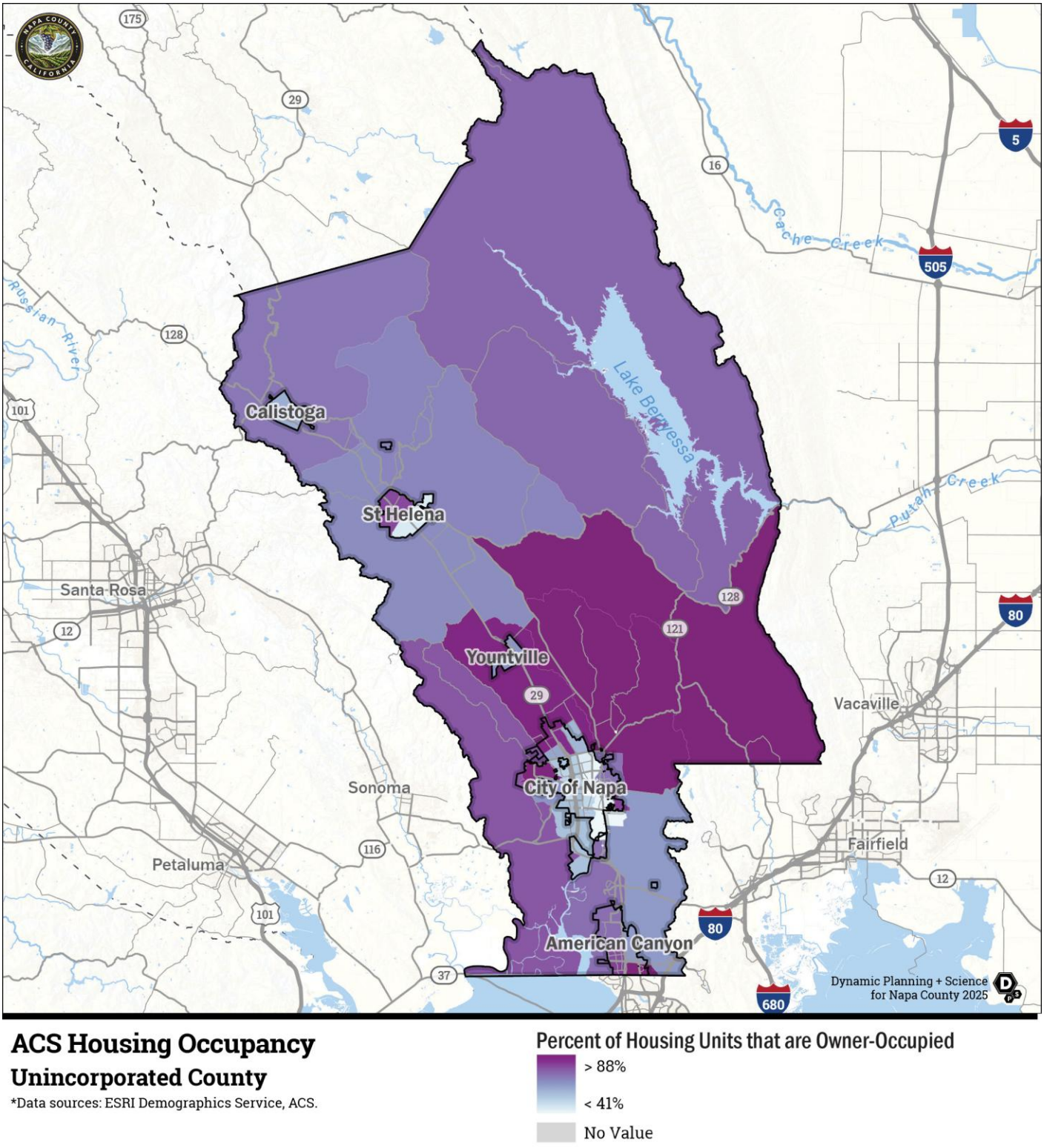


Figure 1-7: Napa County Housing Occupancy

1.5.3.3 Dependent & Disabled Populations

Age and disability status play significant roles in vulnerability to natural hazards, as seniors, children, and many who experience disabilities are dependent populations who rely on caregiver networks for support and protection. Seniors and disabled persons may have mobility challenges and increased health concerns, necessitating additional assistance during evacuations and recovery. Similarly, children have limited ability to protect themselves and depend on caregivers to ensure their safety and well-being during emergencies. When combined with factors such as poverty, these vulnerabilities can be further compounded, highlighting the importance of targeted interventions to address the unique needs of dependent and disabled populations.

Although vulnerability among persons in the same age cohort varies significantly based on health and socioeconomic security, seniors as a group have a higher prevalence of physical and financial barriers to response and recovery, both during and after an emergency, and are more prone to health-related consequences, making recovery slower. They are more likely to experience vision, hearing, or mobility impairments, as well as mental impairments. Additionally, many elderly individuals reside in assisted-living facilities where emergency preparedness depends on the facility operators. These facilities are typically identified as “critical facilities” by emergency managers because they require extra notice and resources to implement evacuations. Further, seniors living alone may have difficulty evacuating their homes and could be stranded in dangerous situations. This population often needs special medical attention, which may not be readily available during a disaster event due to isolation. Given the current aging of the American population, specific planning for the elderly is warranted.

According to ACS data, approximately 34% of households in unincorporated Napa County in 2022 included at least one senior individual (over 65 years of age), which is much higher than the statewide average of around 22%. Further, the Napa County Baseline Data Report identifies 10% of the total unincorporated county population as over 75 years old, compared to approximately 9% of the county-wide population. (Napa County, 2026)

Almost 9% of seniors in the county live alone, and approximately 2% live in poverty (Table 1-6). The highest concentrations of seniors are located in and around Yountville (48%), Calistoga (39%), and St. Helena (33%), all of which also have more seniors living alone.

Table 1-6: Napa County Households with Seniors

		Households with 65+					
Area	Households	65+	%	65+ Alone	%	65+ Poverty	%
Napa County (Unincorporated)	**55,588**	**18,777**	**33.8%**	**4,816**	**8.7%**	**1,271**	**2.3%**
American Canyon	5,924	1,772	29.9%	184	3.1%	111	1.9%
Calistoga	2,330	1,003	43.0%	419	18.0%	101	4.3%
Napa (City)	31,666	10,299	32.5%	2,674	8.4%	703	2.2%
St. Helena	2,963	1,153	38.9%	296	10.0%	42	1.4%
Yountville	1,824	873	47.9%	351	19.2%	77	4.2%

Source: ACS 5-Year, 2017-2022

People under the age of 18 have little control over their living situation or household actions for hazard preparedness, response, or recovery. Disasters may have detrimental long-term effects on children, both mentally and physically and especially when living in poverty. Those children living in households with a single caregiver may also be more vulnerable due to compounding factors, such as reduced financial resources.

An estimated 26% of households in the unincorporated county include children under the age of 18 years as of 2022, making up a little over 21% of the total unincorporated county population compared to less than 20% of the county-wide population. About 6% of households with children are run by a single caregiver. The City of American Canyon has the highest rate of households with children at almost 45%, while Yountville has the lowest at less than 9%.

Table 1-7: Napa County Households with Children

		Households with Children <18			
Area	Households	<18	%	<18 Single Caregiver	%
Napa County (Unincorporated)	**55,588**	**14,596**	**26.3%**	**3,109**	**5.6%**
American Canyon	5,924	2,633	44.4%	417	7.0%
Calistoga	2,330	471	20.2%	33	1.4%
Napa (City)	31,666	8,934	28.2%	2,315	7.3%
St. Helena	2,963	619	20.9%	168	5.7%
Yountville	1,824	160	8.8%	0	0.0%

Source: ACS 5-Year, 2017-2022

The overall distribution of dependent age groups (seniors and children) in Napa County is illustrated in Figure 1-8. The highest concentrations of these groups are located in and around incorporated areas where

more schools, healthcare, and other services are available. The map also shows a higher percentage of dependent age groups located in the Lake Berryessa area, where over 40% of the population is in one or the other age category. However, as one of the most rural portions of the county, the total population within this Census County Division (CCD) is very low—approximately 1,300 people—with around five people per square mile. (ACS 5-Year, 2022)

As discussed in Section 1.5.3.1, those with access and functional needs may experience more difficulties in preparing for, responding to, or recovering from a disaster or emergency event. This includes persons living with one or more physical or cognitive disabilities such as hearing or vision impairment, reliance on mobility or other medical devices, mental disorders or neurodivergence, and chronic health conditions that increase susceptibility to hazard impacts like wildfire smoke. As such, these at-risk individuals may require additional time or personnel to assist during an evacuation or other emergency and special attention is warranted from planners and emergency managers this highly vulnerable population.

According to the ACS, 12% of the unincorporated county's non-institutionalized population has some form of disability, and the percentage of people with disabilities in most municipalities is between 10% and 13% (Table 1-8). However, the Town of Yountville's population tends to be much older (48% over age 65) and, consequently, has a much higher percentage of persons with a disability (over 20%). Elderly populations with a disability are mostly concentrated in and around the Cities of Napa and American Canyon and the Town of Yountville, as shown in Figure 1-9, but a significant portion of the population over 65 in the Lake Berryessa CCD experiences disabilities.

Yountville is also home to more households without a personal vehicle (near 12%) compared to the rest of the county, aligning with its older demographic characteristics. The Cities of Napa St. Helena also have higher portions of households without a vehicle, at around 5% and 7% respectively. Overall, the number of persons reliant on public transit is less than 1%, except in American Canyon and St. Helena.

Table 1-8: Napa County Population with Disabilities and Access to Transportation

Area	Population	Persons w Disability	%	Persons Reliant on Public Trans.	%	Households	HH w No Vehicle	%
Napa County	**137,384**	**16,544**	**12.0%**	**890**	**0.6%**	**55,588**	**2,421**	**4.4%**
American Canyon	21,669	2,201	10.2%	287	1.3%	5,924	138	2.3%
Calistoga	5,191	573	11.0%	36	0.7%	2,330	83	3.6%
Napa (City)	79,233	9,837	12.4%	291	0.4%	31,666	1,554	4.9%
St. Helena	5,426	683	12.6%	121	2.2%	2,963	219	7.4%
Yountville	3,397	683	20.1%	15	0.4%	1,824	210	11.5%

Source: ACS 5-Year, 2017-2022

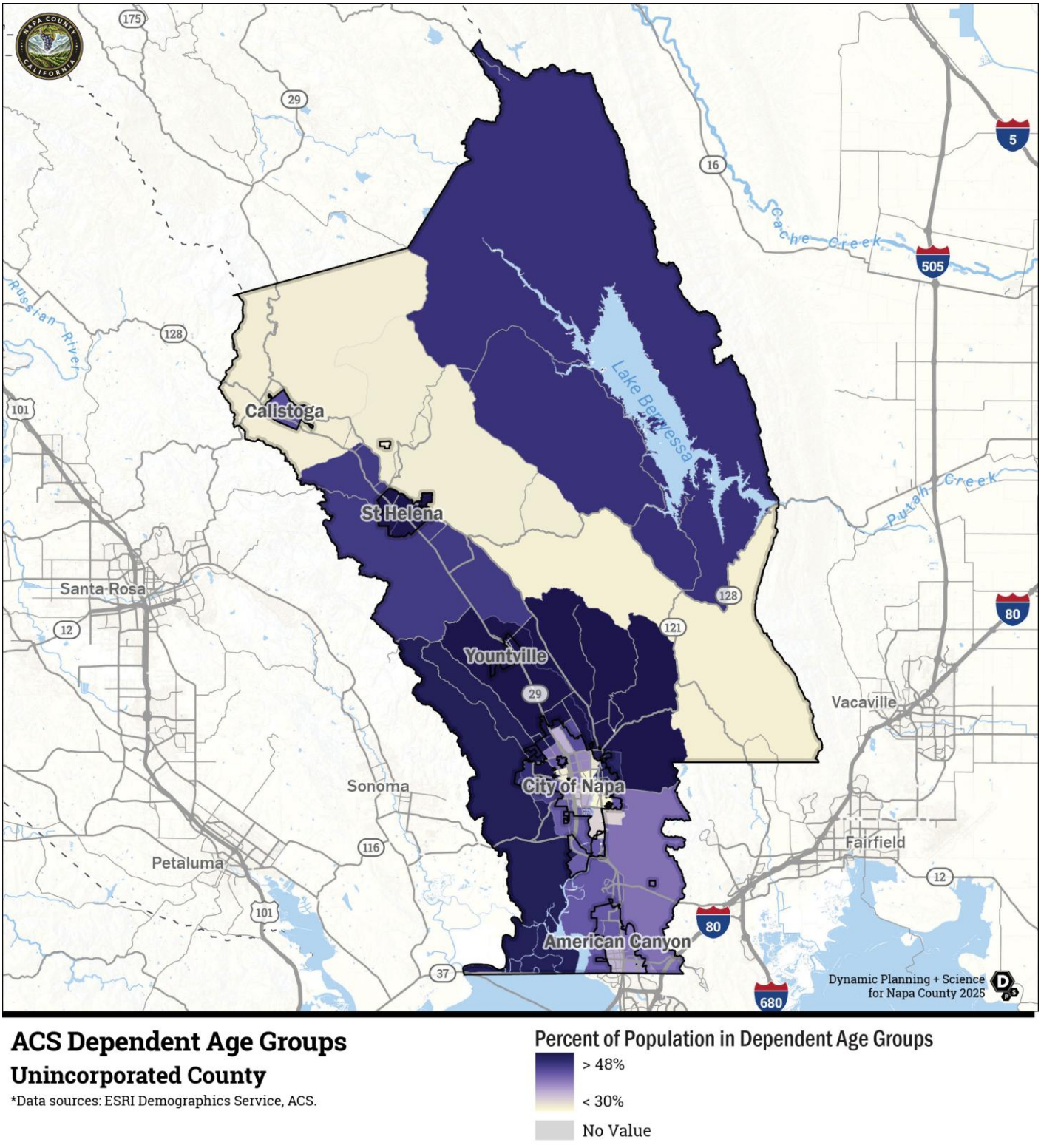


Figure 1-8: Napa County Dependent Age Groups

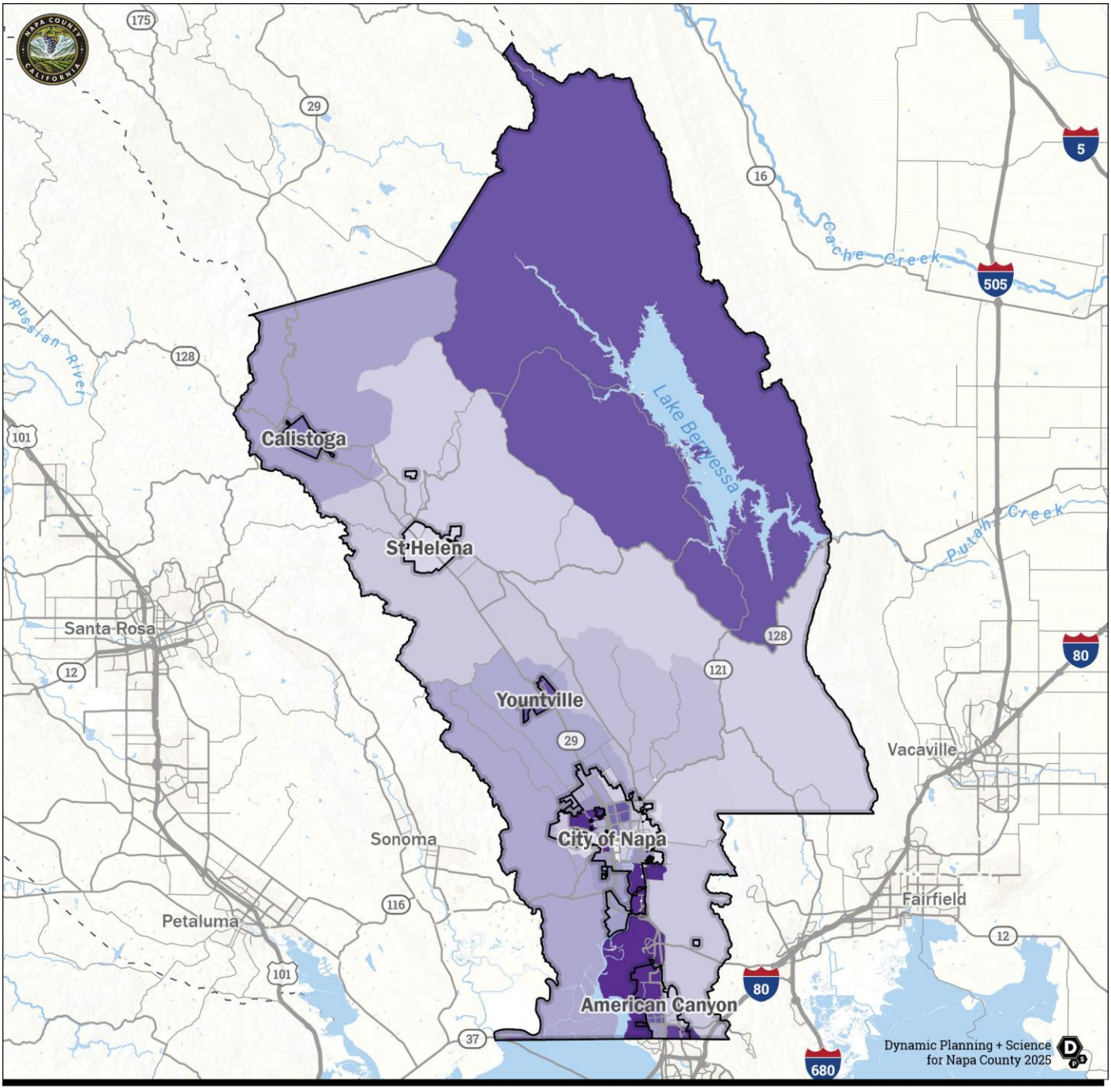


Figure 1-9: Napa County Disabled Elderly

1.5.3.4 Race, Ethnicity & Language

Natural disasters compound racial disparities; non-white individuals and communities receive less recovery aid from FEMA than their white counterparts, even when the extent of damage is the same. (Howell & Elliot, 2019) (National Advisory Council, 2020) Research indicates that minorities are less likely to participate in pre-disaster planning and experience higher mortality rates during disaster events. Post-disaster recovery for these groups is also often ineffective and can sometimes be culturally insensitive. Since a higher proportion of ethnic minorities live below the poverty line compared to white populations, poverty exacerbates their vulnerability. (Fothergill, 1999)

These disparities illustrate the complex relationship between disaster recovery and overlapping social vulnerabilities such as race, income, language, and health. Black and Latino residents are more likely to be low-income renters, which creates barriers to navigating FEMA's IA programs. Communities with higher proportions of non-white residents may have lower tax revenue and property values, resulting in less investment in mitigation and rebuilding efforts both before and after emergencies. The recent COVID-19 pandemic highlighted these disparities, with non-white persons facing significantly higher morbidity rates from infections—ranging from 70% to 350%—than those of white, non-Hispanic individuals. (CDC, 2020)

It is important to note that some minority households may avoid participating in Census surveys due to mistrust of government agencies or concerns about immigration status. This can lead to underreporting, further obscuring the true extent of racial, ethnic, language-related vulnerabilities.

Non-English speaking or limited English proficiency individuals may struggle to understand emergency information due to language and literacy barriers, often resulting in confusion about who to trust for accurate information. These individuals may be unable to access up-to-date emergency information and may have difficulty navigating recovery programs. Local governments can take steps to increase equity in disaster preparedness and recovery outcomes by translating preparedness materials and emergency notifications in a timely manner and partnering with local community groups to target outreach more effectively to at-risk populations.

The unincorporated and rural areas of Napa County are predominately White, but the southern most portion of the county closer to the bay have significant Hispanic, Latino, and Asian populations (Figure 1-10). Further, in the Cities of Napa, American Canyon, and Calistoga about one-fifth (18 to 20%) of housholds speak Spanish, compared to approxiamtely 16% of households in the unincorporated county (Table 1-9). Although the overall number of limited English speakers in the county is low, between 1% and 5%, these numbers are significant for mitigation and emergency planning purposes.

Table 1-9: Napa County Household Languages

Area	Households (HH)	Spanish Speaking	%	Limited English	%
Napa County	**55,588**	**8,738**	**15.7%**	**2,141**	**3.9%**
American Canyon	5,924	1,069	18.0%	177	3.0%
Calistoga	2,330	474	20.3%	63	2.7%
Napa (City)	31,666	5,800	18.3%	1,653	5.2%
St. Helena	2,963	370	12.5%	88	3.0%
Yountville	1,824	49	2.7%	21	1.2%

Source: ACS 5-Year, 2017-2022

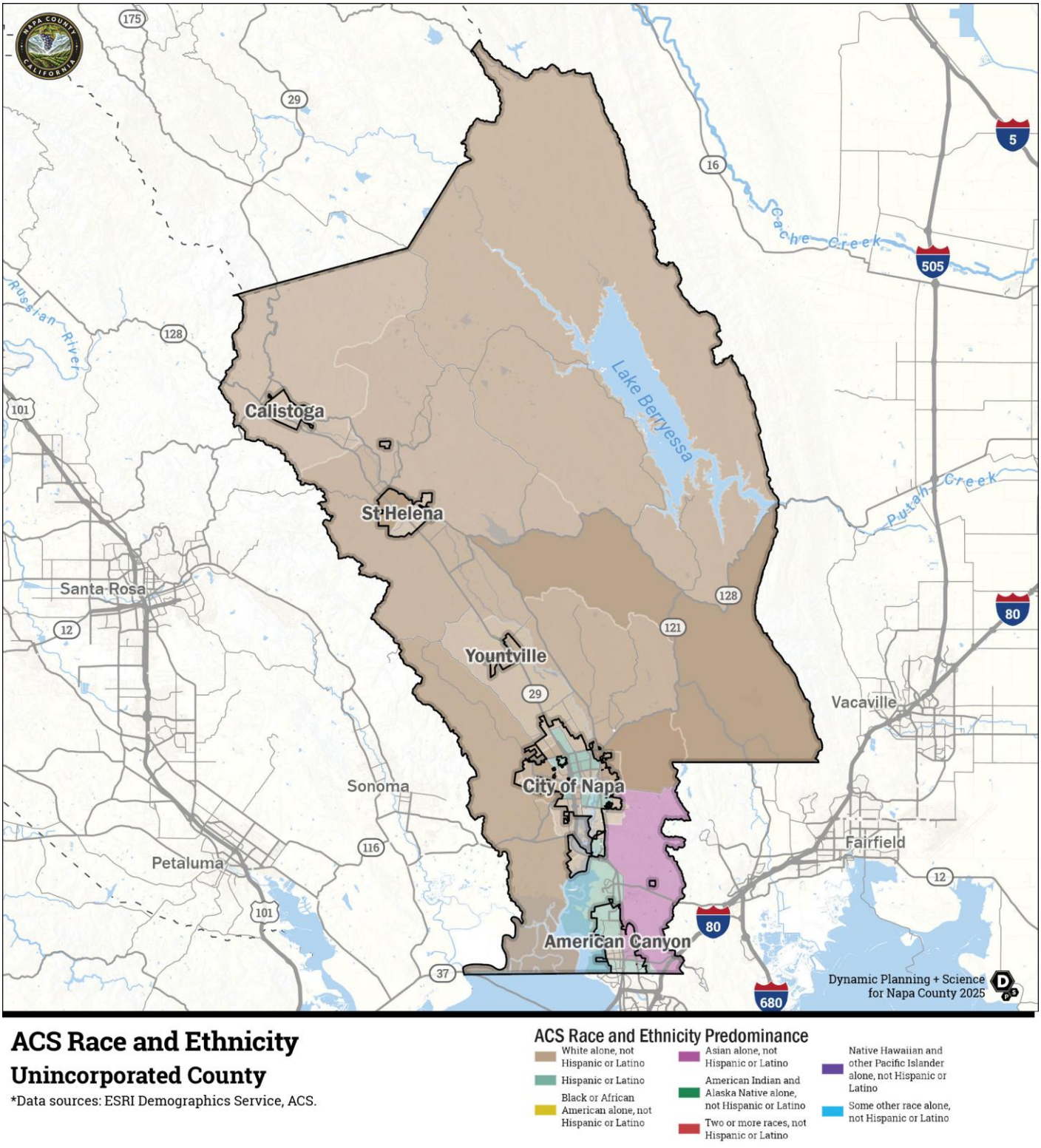


Figure 1-10: Napa County Race and Ethnicity

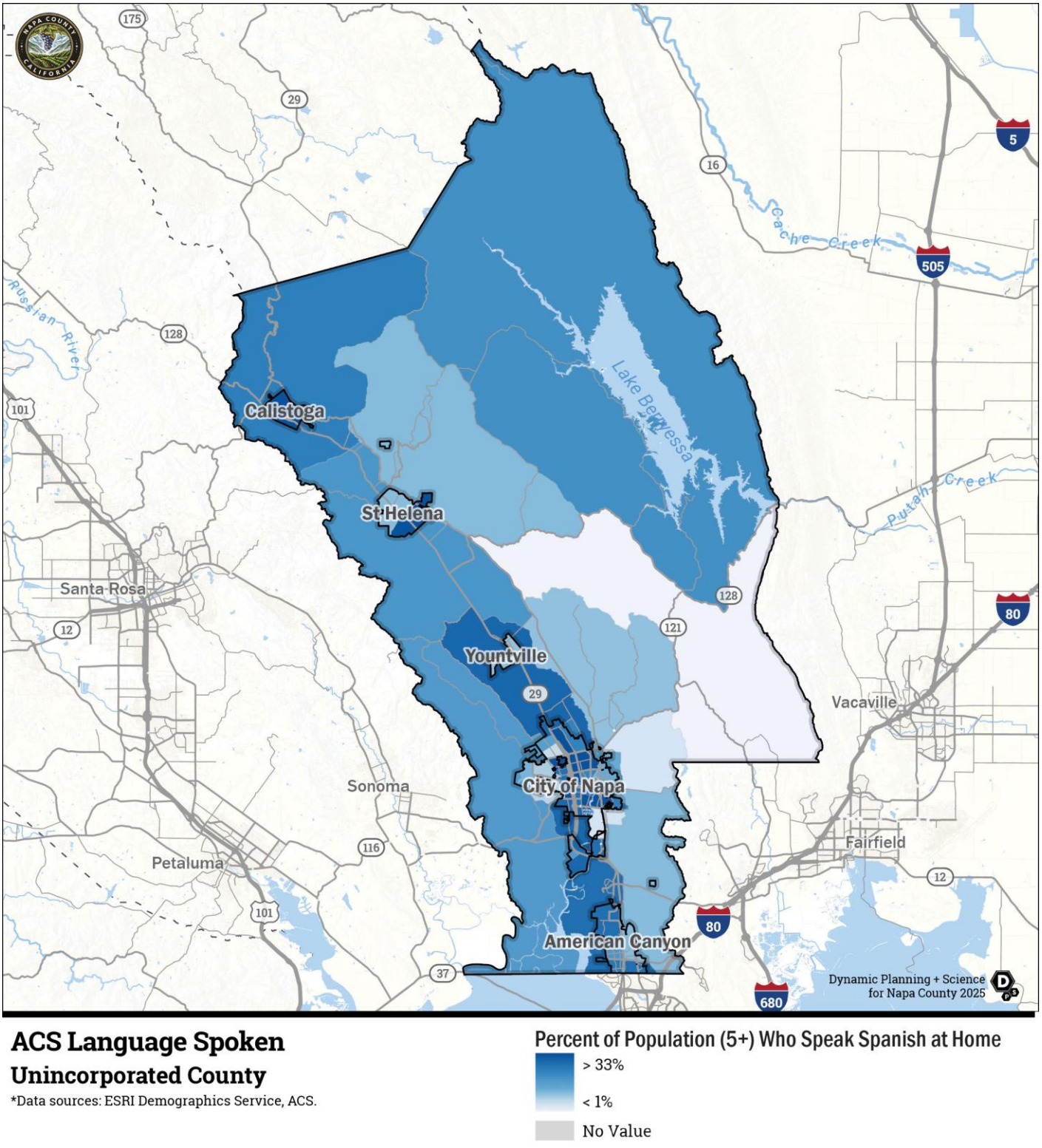


Figure 1-11: Napa County Spanish-Speaking Households

1.5.3.5 Agricultural Workers

The agricultural industry in Napa County, predominantly consisting of viticulture, is supported by a fluctuating population of year-round and annually/seasonally returning agricultural workers. Agricultural workers account for about 5% of Napa County's total workforce, peaking around 11,000 workers during harvest season. Agriculture accounts for nearly 10% of the total land area in the county, with farmworkers playing a vital role in the community and its agricultural production. About 40% of farmworkers in the Napa Valley work year-round, with about 67% living in Napa County. The other 60% of workers return seasonally, with about 33% living in Napa County. These two groups face distinct challenges when it comes to accessing housing and healthcare, overcoming linguistic isolation, and accessing social services. (Napa County, 2024)

Finding safe, healthy, and affordable housing within the county is a major challenge for most farmworkers who must secure accommodations on the open market and often live in overcrowded conditions, leveraging three to four paychecks to make rent. (*Id.*) Farmworkers typically fall between extremely low and very low income levels ($40,050 to $66,750), compared to Napa County's area median income (AMI) of $129,600 for a household of four. As a result, finding adequate housing in Napa County, where the median home price is around $1 million according to Zillow and Redfin, is a challenge along with paying for other essential needs like utilities, food, and medical care.

Agricultural workers may be particularly vulnerable during a hazard event, especially those who are non-English speaking or living in temporary worker housing. In addition, some farmworkers may not have proper documentation to be working in the U.S. and may be more hesitant to seek aid or ask questions to properly prepare for a hazard event because of their immigration status. As a result, agricultural workers are a highly vulnerable population, especially when exposed to a hazard event such as extreme heat or wildfire smoke.



Figure 1-12: Napa Valley Vineyard
Source: Photo by Jeff Tangen, 2021

1.5.3.6 Social Vulnerability Index (SVI)

The U.S. Centers for Disease Control (CDC) developed the Social Vulnerability Index (SVI) to quantify social vulnerability. The SVI ranks Census Tracts, Census County Divisions (CCD), or other appropriate statistical divisions based on sixteen variables across four key themes: socioeconomic status, housing and transportation, racial and ethnic minority status, and household characteristics. The SVI measures a community's ability to prepare for and recover from hazardous events. This composite index provides a percentile ranking, with those statistical divisions in the 90th percentile or above identified as having the highest social vulnerability to public health emergencies and natural hazard events.

A map of Napa County's SVI ratings are shown in Figure 1-13.

Socioeconomic Status

Socioeconomic status is a strong predicter of hazard vulnerability, as lower-income households bear disproportionate financial burdens from the costs associated with disaster preparedness, response, and recovery. Socioeconomic conditions in Napa County play a significant role in shaping vulnerability to natural hazards, particularly for lower-income households and workers in the agricultural sector.

Median household income varies widely across the county, with lower incomes and higher poverty rates concentrated in the southern portion of the City of Napa, northern American Canyon, the Yountville area, and rural communities near Lake Berryessa. Households with limited financial resources often face greater difficulty preparing for, responding to, and recovering from disasters because they may lack savings, insurance coverage, or the ability to retrofit homes against hazards. These conditions can lead to disproportionate impacts from flooding, wildfire, and extreme heat, especially where vulnerable populations live in hazard-prone locations. In addition, the 2024 Farmworker Housing Needs and Impacts Assessment notes that many agricultural workers fall within extremely low to very low income levels and often rely on multiple incomes to afford rent, making them particularly vulnerable to displacement following disasters and less able to invest in mitigation measures such as defensible space, insurance, or home hardening.

The SVI map in Figure 1-13 shows higher vulnerability scores in the southern portion of the county, including areas in and around the City of Napa, American Canyon, and adjacent unincorporated communities, where Census divisions rank in the upper percentiles. These higher scores reflect concentrations of lower-income households, renters, and workers in service and agricultural industries who may have fewer financial resources available for preparedness, mitigation, and recovery.

Housing & Transportation

Napa County's SVI highlights disparities in housing and transportation that disproportionately impact lower-income populations, rural residents, and agricultural worker communities. In Napa County, these vulnerabilities are shaped by geographic isolation, limited affordable housing, and reliance on personal vehicles for mobility in some areas.

Housing affordability remains a significant concern, with median home prices and rental costs rising faster than income levels, pushing lower-income residents toward more vulnerable housing conditions. Many individuals, particularly in rural areas, live in older or substandard housing that may be more susceptible to extreme weather events, wildfires, and infrastructure failures. The lack of affordable rental options forces some residents into mobile homes or shared housing arrangements, which can present additional risks in terms of structural integrity and emergency response challenges.

A significant portion of the housing stock in the county was constructed prior to modern seismic, wildfire, and energy efficiency standards, increasing the likelihood of damage during earthquakes, wildfires, or severe weather events. Renters, who make up a substantial share of households in the City of Napa and parts of the unincorporated county, often live in older or more densely occupied units and have limited ability to make structural improvements, leaving them more exposed to hazard impacts. The 2024 Farmworker Housing Needs and Impacts Assessment also indicates that many agricultural workers live in overcrowded or temporary accommodations due to high housing costs, which can complicate evacuation, sheltering, and recovery efforts.

Transportation barriers also contribute to social vulnerability, as some parts of Napa County lack public transit infrastructure. Families and individuals without personal transportation, including many lower-income households and older adults, face challenges in rapidly evacuating and difficulties accessing essential or medical services due to limited transportation options. Rural communities, in particular, may experience longer travel times to economic centers where most healthcare facilities and emergency shelters are located, further exacerbating disparities in access. In the event of natural disasters or road closures due to earthquake, wildfire, flood, or another disaster, these transportation challenges can hinder evacuation efforts and access to relief services.

Transportation access is a concern particularly for seniors, low-income households, and rural residents. Although overall transit reliance is low, some areas—especially Yountville, St. Helena, and portions of the City of Napa—have higher percentages of households without vehicles, which may limit evacuation ability during wildfires or floods and increase reliance on public assistance during emergencies.

Areas with higher SVI scores correspond to areas with higher renter occupancy, older housing stock, and more limited access to personal vehicles. The SVI map shows moderate to high vulnerability in the City of Napa and the Napa Valley corridor, where a larger share of multi-family housing and rental units are located.

Race, Ethnicity & Language

Natural disasters compound racial disparities. While much of Napa County's rural population is White, the southern part of the county, including the City of Napa and American Canyon, has larger Hispanic/Latino and Asian populations. Overlaid with socioeconomic data, these communities tend to include lower-income households and renters, which are more vulnerable during disaster events.

Language barriers can also limit access to emergency warnings, preparedness information, and recovery programs. Approximately one-fifth of households in several jurisdictions speak Spanish at home, and a smaller but meaningful percentage of residents have limited English proficiency, which can delay evacuation, reduce awareness of available resources, and make it more difficult to navigate disaster assistance programs. Outreach, translation of emergency information, and coordination with community organizations are therefore critical components of equitable hazard mitigation planning in Napa County.

The SVI map in Figure 1-13 highlights the relationship between social vulnerability and racial, ethnic, and language characteristics in Napa County. Higher SVI rankings are concentrated in the southern and central valley areas where there are larger non-White populations. These communities often experience overlapping vulnerabilities related to income, housing, and language barriers. Census divisions with higher SVI scores correspond to areas where a greater percentage of households speak Spanish at home or have limited English proficiency, which can reduce access to emergency warnings, preparedness information, and recovery programs if outreach is not provided in multiple languages.

The SVI results underscore the importance of culturally appropriate communication, translation of alerts, and coordination with community-based organizations to ensure that all residents can understand and respond to hazard warnings and recovery assistance opportunities.

Household Characteristics & Dependent Populations

The specific makeup of different households can influence their level of vulnerability and ability to prepare for and recover from hazard events. This is especially true for households with children under a single caregiver, persons with a disability, or seniors living alone. When any of the former are living in poverty, these vulnerabilities are compounded.

Napa County has a relatively high proportion of seniors compared to statewide averages, with some communities such as Yountville, Calistoga, and St. Helena having particularly large elderly populations. Many seniors live alone or have mobility, medical, or cognitive limitations that require additional assistance during evacuations and recovery. Households with children, especially those headed by a single caregiver, may also face increased challenges due to limited financial resources and dependence on schools or childcare services that may be disrupted during disasters.

Areas with higher SVI scores often coincide with communities that have larger proportions of seniors, persons with disabilities, or single-parent households (Figure 1-13). Higher concentrations of seniors are found in Yountville, Calistoga, St. Helena, and parts of the unincorporated county where the SVI map shows moderate vulnerability. Rural areas in the eastern and northern portions of the county also show elevated vulnerability scores, reflecting a significant age-dependent, but sparse, population which also faces isolation, limited transportation options, and reduced access to medical and emergency services. These characteristics can significantly increase the time and resources required for evacuation and recovery. As such, the needs of dependent and access-and-functional-needs populations must be accounted for to ensure equitable preparedness, response, and recovery outcomes.

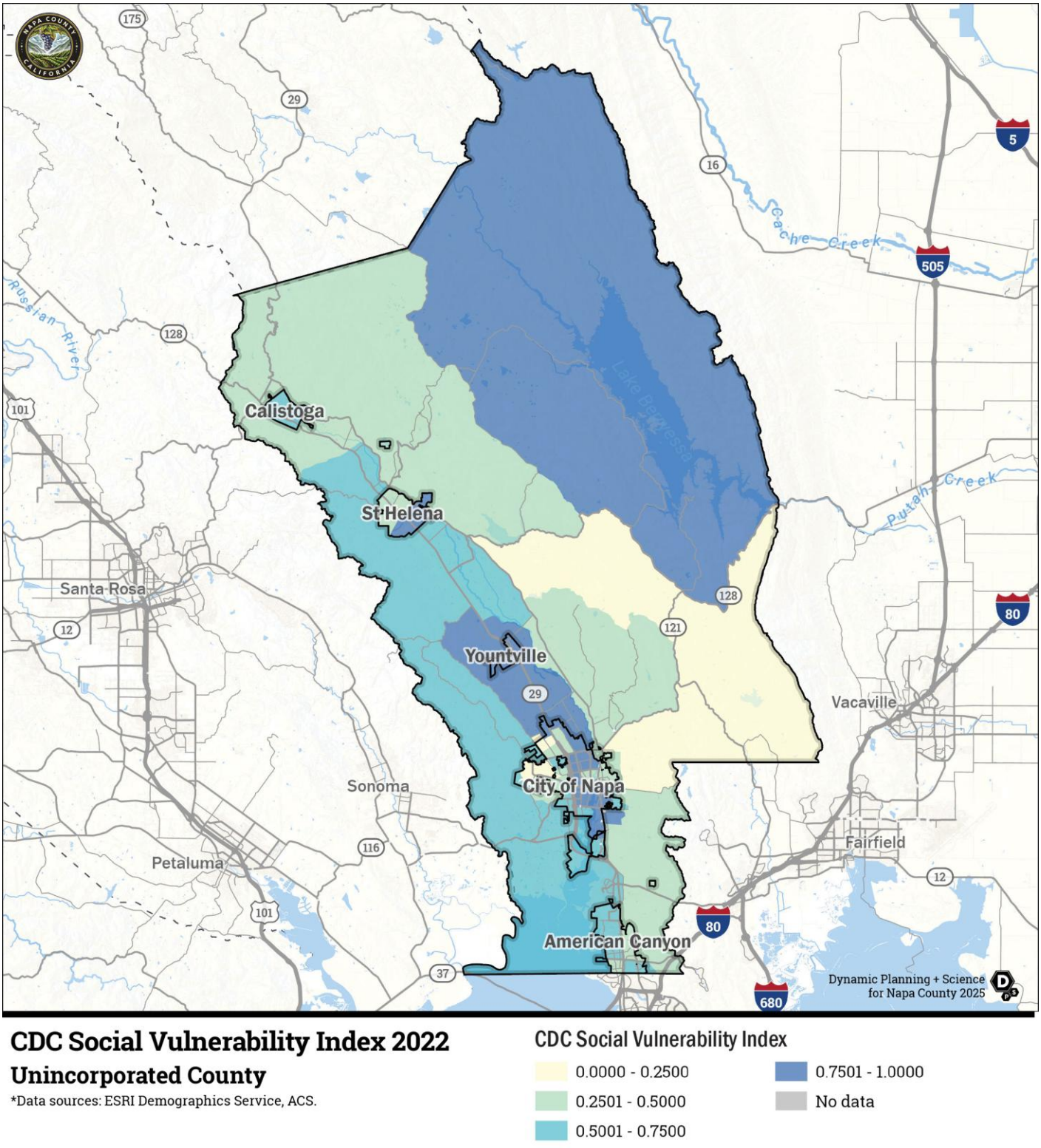


Figure 1-13: Napa County CDC Social Vulnerability Index

1.5.4 Economy

Hazard events can have a significant impact on the economy of a region, including lost jobs and unemployment following the disaster. Loss of agricultural production and tourism impacts are particularly significant in Napa County, given that three out of every four jobs in the county exist because of the local wine industry.

Napa County is the center of California's wine industry and is particularly susceptible to economic losses from hazard events that impact local agriculture and viticulture, such as from wildfire, flooding, or drought. The Napa Valley wine industry accounts for $11.7 billion in economic impact in Napa County, while the wine industry accounts for $21.6 billion in California and $36.7 billion nationwide. (Napa Valley Vintners, 2025) That means Napa County accounts for 54% of California economic impact from the wine industry and almost 32% nationwide. In 2022, all wine produced in Napa County, whether grown in the Napa Valley or grown elsewhere and processed in the valley, represented 6.7% of all the wine produced in California and 5.3% of all the wine produced in the United States. (*Id.*)

Based on data from the U.S. Census Bureau, Napa County had approximately 75,200 total jobs in 2022, around 28,700 of which were estimated to be in the unincorporated county. The City of Napa is the jurisdiction with the largest concentration of jobs (about 33,700), with significantly fewer jobs in the smaller municipalities. (Napa County, 2026)

At the industry level, the largest single sector is Manufacturing, which represents about 13,400 jobs and 18% of total employment county-wide. Wine making dominates this sector, and more than two-thirds of the winemaking jobs are located outside incorporated areas, accounting for almost one-third of the unincorporated county's total jobs. Health Care and Social Assistance accounts for the next largest proportion of jobs at almost 15%, followed closely by Accommodation and Food Services at about 14%. No other sectors account for more than 8% of the county-wide jobs total.

For Napa County as a whole, Health Care and Social Assistance and Accommodation and Food Services are the number two and three job sectors. Not surprisingly, given the emphasis on grape growing in the county, Agriculture, Forestry, Fishing, and Hunting represent over 11% of total jobs in the unincorporated areas. Although Napa County's agricultural activities dominate the landscape, they only represent about 7% of county-wide jobs, with over 60% of these jobs in the unincorporated county.

Jobs within the top industry sectors are summarized by jurisdiction and compared to total jobs county-wide in Table 1-10.

Table 1-10: Napa County Jobs by Top Industry Sector, 2022

Employment Sector	Number of Jobs	% of Jobs
Napa County (Total)	**75,212**	**100.0%**
Agriculture, Forestry, Fishing and Hunting	5,381	7.2%
Construction	4,676	6.2%
Manufacturing	13,370	17.8%
Retail Trade	5,820	7.7%
Admin/Support, Waste Management and Remediation	4,195	5.6%
Educational Services	4,208	5.6%
Health Care and Social Assistance	11,100	14.8%
Accommodation and Food Services	10,442	13.9%
Napa County (Unincorporated)	**25,830**	**34.3%**
Agriculture, Forestry, Fishing and Hunting	3,255	12.6%
Construction	2,000	7.7%
Manufacturing	8,881	34.4%
Health Care and Social Assistance	3,104	12.0%
Accommodation and Food Services	1,878	7.3%
City of Napa	**33,749**	**44.9%**
Construction	1,986	5.9%
Manufacturing	1,789	5.3%
Retail Trade	3,941	11.7%
Admin/Support, Waste Management and Remediation	2,524	7.5%
Educational Services	2,286	6.8%
Health Care and Social Assistance	5,941	17.6%
Accommodation and Food Services	5,002	14.8%
Public Administration	2,245	6.7%
City of American Canyon	**5,021**	**6.7%**
Construction	395	7.9%
Manufacturing	887	17.7%
Retail Trade	735	14.6%
Transportation and Warehousing	521	10.4%
Admin/Support, Waste Management and Remediation	413	8.2%
Health Care and Social Assistance	795	15.8%
Accommodation and Food Services	419	8.3%
City of St. Helena	**5,515**	**7.3%**

Employment Sector	Number of Jobs	% of Jobs
Agriculture, Forestry, Fishing and Hunting	636	11.5%
Manufacturing	1,385	25.1%
Retail Trade	470	8.5%
Professional, Scientific, and Technical Services	368	6.7%
Educational Services	383	6.9%
Accommodation and Food Services	897	16.3%
City of Calistoga	**2,267**	**3.0%**
Manufacturing	148	6.5%
Retail Trade	154	6.8%
Admin/Support, Waste Management and Remediation	154	6.8%
Educational Services	174	7.7%
Accommodation and Food Services	1,107	48.8%
Town of Yountville	**2,830**	**3.8%**
Manufacturing	280	9.9%
Retail Trade	216	7.6%
Health Care and Social Assistance	928	32.8%
Accommodation and Food Services	1,139	40.2%

Source: Napa County Baseline Data Report, 2026

Notes: Only those sectors accounting for more than 5% of jobs were listed.

Housing was one of the greatest losses tracked during the 2017 Sonoma Complex fires, which primarily affected neighboring Sonoma County but also westerly portions of Napa County. Sonoma County lost 5,300 home or 2.5% of its housing stock in the fire, while already facing growth constraints due to the high cost of housing. After the fires, this put Sonoma County on track to need 26,000 new homes constructed by 2020 to meet growth and employment needs; a daunting number considering Sonoma County permitted 730 units in 2016. (Beacon Economics, 2018)

Loss of tourism in the aftermath of a hazard event is another economic impact of particular concern for Napa County. After wildfire events in 2017 and 2018 which affected Napa County but focused considerably more damage in Sonoma County, the region cited public perception of wildfires in a downtick in tourism. The region is focusing on diversifying the season of tourism travel away from the fire-prone fall harvest season as one way to reduce those economic impacts. (Lenhard, 2019)

1.5.5 Development History & Growth Trends

Napa County has long been on the forefront of planning for the preservation of agricultural lands and intends to remain leaders in planning for a sustainable future. Napa County has retained its prime vineyard lands in production, even while vast tracts of farmland in other parts of the Bay Area have been urbanized. The county established the first Agricultural Preserve in California in 1968, and this urban-centered growth, with homes and businesses concentrated in incorporated areas to preserve farmland, has characterized the Napa Valley ever since and well before "smart growth" movement. The county continues to apply these same principles to reducing hazard risks to its residences and its critical resources into the future.

The past development that most increased the risk of hazards in the county happened many decades or more than a century ago. The county and other participating jurisdictions are well aware of areas of increased hazard risk through older development and have worked toward mitigating identified vulnerabilities induced by it. More recently, in the last few decades, development has occurred with minimized hazard risk because of existing overlay of federal, state, and local regulations. These current efforts to plan for hazards and growth are detailed in Section 4.2.1.

Historical Development Patterns

Around the time the population of California was growing exponentially, the City of Napa was laid out by Nathan Coombs in 1848. As one of a handful of established communities north of the Delta/Bay Area at the time of the gold rush with convenient access via trail and river, the Napa Valley drew in many of the miners disillusioned by the gold fields and severe winters in the Sierra Nevada. Timber harvesting, sawmills, and cattle ranches provided employment. The burgeoning population helped build the City of Napa from a tent city along Main Street to the primary business and economic center for the Napa Valley it is today. (Napa County, 2026)

In the 19th century, before Napa Valley became the home of a thriving wine industry, the region's natural geothermal resources produced an emergent wellness industry around the hot springs—originally used by the Wappo people—extending from the Mayacamas Mountains to the Vaca range. The springs attracted a growing number of tourists and White Sulphur Springs, located near current St. Helena, became the first mineral springs resort in 1852. Its rapid popularity led to a proliferation of similar enterprises and, by the 1920s, hundreds of resorts and hotels were established throughout the valley. (*Id.*)

George Yount planted the first grapes in the Napa Valley in 1839, followed soon after by other pioneers. In St. Helena, Charles Krug is credited with establishing Napa Valley's first commercial winery in 1861, sparking a wave of new growth in the wine industry until a devastating aphid infestation in the early 1900s killed off most of the vineyards and the Volstead Act outlawed the sale of most alcohol from 1920 to 1933. Many landowners gave up on wine grapes and replanted crops, primarily fruit and nut trees. (*Id.*) Since then, the valley's wind industry has become one of the most prominent wine producing regions in the United States.

One factor that made Napa Valley a prime wine grape growing region is its unique soil composition from the Napa River, which has changed alignments over time and flooded the area on a regular basis. While good for soil development, flooding is not good for growing grapes or for the communities in the reach of the river's floodplain. Since settlers began keeping track of notable hazard events, more than 20 serious floods have been recorded since 1862. (*Id.*) However, due to the early adoption of strict land use and agricultural preservation policies in the 1960s and 70s, Napa County has remained sparsely developed except along the Napa River corridor.

Recent Growth & Development

According to the ACS, unincorporated Napa County's population has grown very little over the past decade and was approximately 137,000 in 2022 (Figure 1-14). Most of the development in Napa County since 2010 has occurred in and around the incorporated areas, especially the two largest cities of Napa and American Canyon. Development in the past decade has also occurred, to a lesser extent, in and around St. Helena and Calistoga, with the Town of Yountville and unincorporated county areas seeing the least development activity.

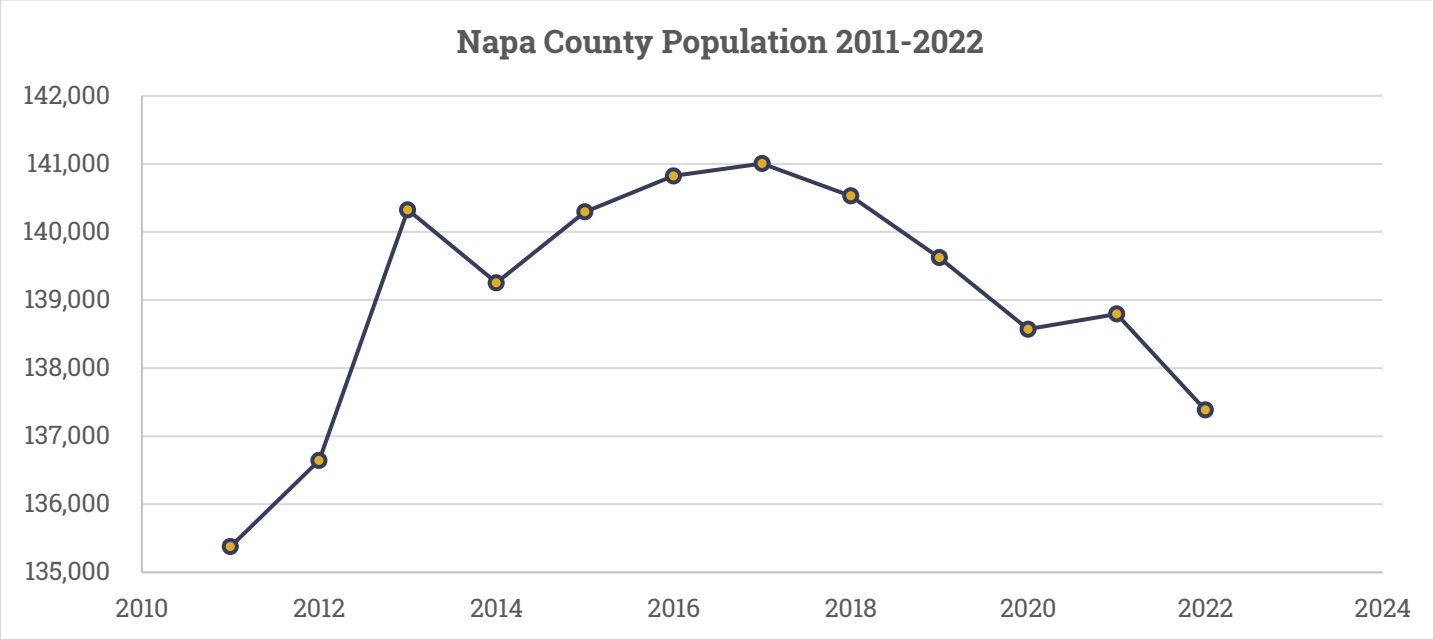


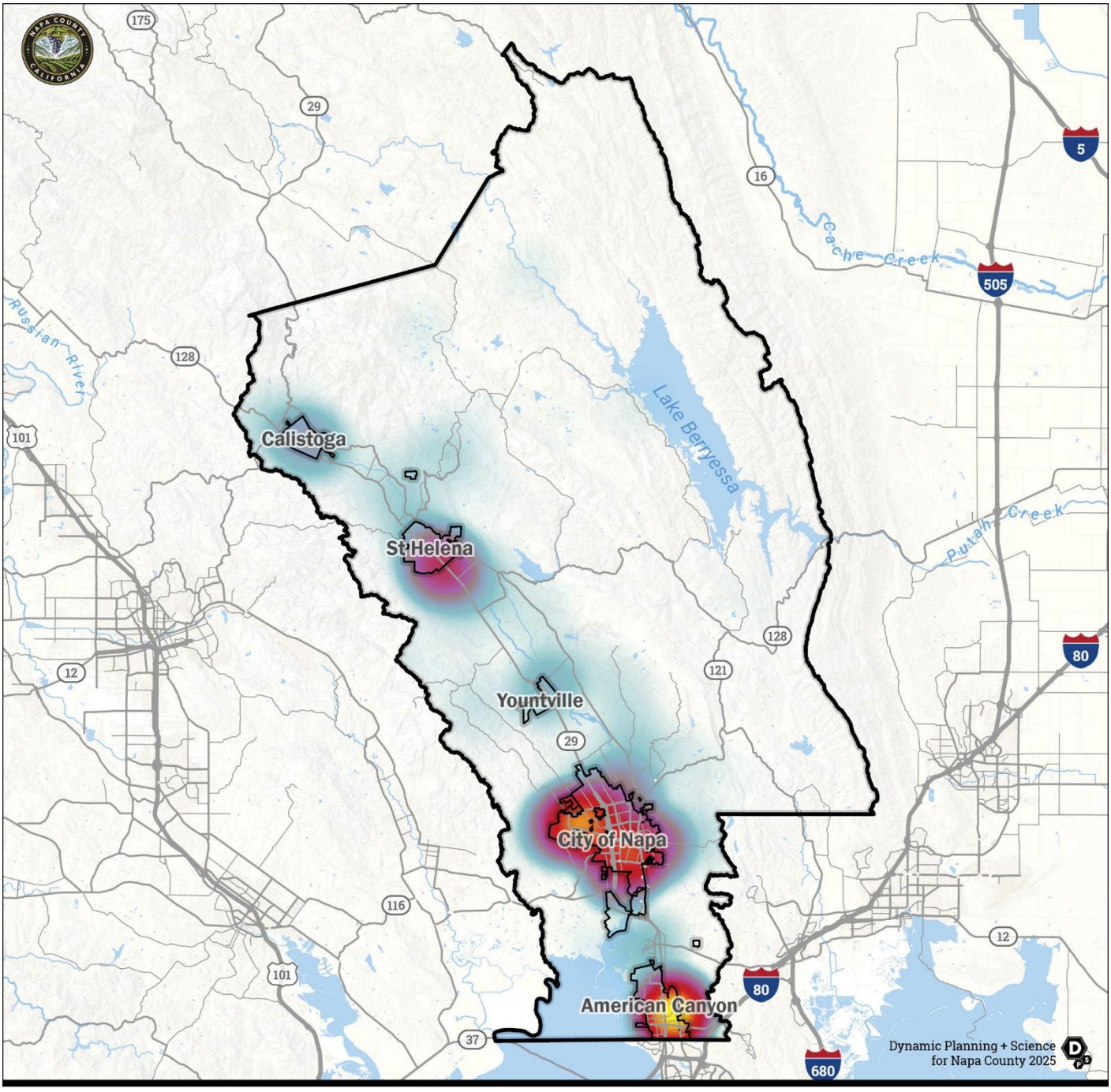
Figure 1-14: Napa County Population 2011-2022

Source: ACS 5-Year, 2017-2022

Figure 1-15 provides an overview of parcel development density since 2010, as measured by structure year built codes within the Napa County Assessor's data. This "heat map" of development identifies areas of more (yellow) or less (blue or no color) growth.

Recent development patterns reflect Napa County's longstanding commitment to agricultural preservation, focusing growth into incorporated areas where utilities and services are more available, as discussed further in Section 4.2.1. There is very little development activity that has occurred since the 1980s outside of the Napa Valley corridor, in unincorporated areas that are mostly reserved for viticulture or other farming activities or natural resource protection. Population densities are increasing the most in the southern portions of the county, in the Cities of Napa and American Canyon. These areas are attracting development due to their proximity to employment and other opportunities in the Bay Area, built out infrastructure, extensive services, transportation routes, and more affordable housing.

While all areas of the county experience a variety of natural hazards, incorporated areas in the Napa Valley generally are less exposed to hazards such as wildfire and slope failure but are more exposed to those such as flooding and extreme heat. The Cities of Napa and American Canyon are also exposed to climate change impacts such as sea level rise as compared to areas in mid and north Napa County.



Parcel Development Density Since 2010

Unincorporated County

*Data sources: Napa County Assessor Roll

PARCEL DEVELOPEMENT DENSITY

LOW — HIGH

Figure 1-15: Parcel Development Density Since 2010

Projected Growth

Understanding population, housing, and employment growth is essential for assessing hazard vulnerability and planning for long-term resilience in Napa County. Growth patterns influence where people live, how infrastructure is developed, and the extent to which new or existing development may be exposed to hazards such as flooding, wildfires, and earthquakes. Looking to the future, there are a number of demographic trends and land use issues that the county and municipalities will face, not the least of which is the expected growth in population.

The Association of Bay Area Governments (ABAG) provides official long-range growth projections for the county and municipalities, which are used by local jurisdictions to guide land use and hazard mitigation planning. Importantly, these trends must be considered within the framework of the county's General Plan and growth management policies (Measures A and J), which shape where and how new development can occur. These planning mechanisms are discussed in more detail in Section 4.2.1.1.

The overall population in Napa County has declined slightly since 2010, with the decrease driven by the unincorporated area and up valley cities while the cities of Napa and American Canyon added population. (Napa County, 2026) The Plan Bay Area 2050+ projections, prepared by ABAG and Metropolitan Transportation Commission, indicate that the number of households in Napa County will increase by 40% in the next few decades, as shown in Table 1-11, largely driven by growth in the southern portion of the county. South Napa County—which encompasses the Cities of American Canyon and Napa and associated unincorporated areas—is projected to grow by 13,000 households (36%) by the year 2050. North Napa County—Calistoga, St. Helena, Yountville, and surrounding areas—is projected to grow by 8,000 households, which is a 50% over the number of households in 2022. (*Id.*)

The Plan Bay Area 2050+ projections also indicate a slight overall decline in county-wide jobs by 2050, driven by nearly a 10% loss in the north while jobs in the south remain flat. But it should be noted that the projections reflect policy-driven goals to concentrate housing and employment near transit, highlighting one potential long-term outcome out of many possibilities. On the other hand, the market-driven California Employment Development Department's projection anticipates Napa County employment will grow by about 17,200 jobs (22%) between 2020 and 2030, mostly in the grape-growing, winemaking, and tourism-related industries. However, growth concentrated in these industries could increase economic risks and exacerbate housing affordability challenges, as many new workers will likely face difficulty securing housing in the high-cost Napa County market. (*Id.*)

Table 1-11: Napa County Household Growth Projections

	2023	2050	2023	2050	2023	2050
	South Napa County		North Napa County		Napa County Total	
Households	36,000	49,000	16,000	24,000	52,000	73,000
% Growth	36.1%		50.0%		40.4%	

Source: Plan Bay Area 2050+, 2025

Notes: South Napa County encompasses the Cities of American Canyon and Napa and associated unincorporated areas. North Napa County encompasses the Cities of Calistoga and St. Helena, the Town of Yountville, and associated unincorporated areas.

Development Impacts on Hazards

As the population grows, there is likely to be heightened demand for housing, infrastructure, and services, driving new construction and expansion within the city. This development, while essential for accommodating growth, must be carefully managed to ensure compliance with zoning regulations, environmental standards, and hazard mitigation strategies. Understanding the growth projected by ABAG for the Napa Valley region, there is a need for proactive planning to address the potential impacts of future growth, such as increased strain on resources and exposure to natural hazards.

Without careful planning, population growth and increased development could exacerbate impacts from wildfire, flood, earthquake, drought, extreme weather, and climate change hazards. However, under the established local and state planning mechanisms and regulations discussed in Sections 4.2.1 and 4.2.2, the impacts of new development on hazard exposure and risk can be successfully mitigated.

For each of the profiled hazards in Section 3.3 which has been impacted by development trends in the past—or which could be impacted by future growth—a discussion of those trends and impacts if provided.

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Section 2. Planning Process

This section outlines each stage of the planning process used in the development of this MJHMP. The planning process serves as the framework for document creation and adheres to FEMA's recommended four-step hazard mitigation planning approach.



It is essential to recognize that the MJHMP is a dynamic, living document shaped by community engagement. The participatory planning process holds equal importance to the finalized plan itself, fostering community awareness and ensuring that mitigation efforts are integrated into everyday decision-making processes.

The Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended by the Disaster Mitigation Act of 2000 (DMA 2000) (42 USC § 5165), mandates the development of hazard mitigation plans to mitigate the impact of natural disasters. These plans are prerequisites for certain non-emergency disaster assistance through FEMA's Hazard Mitigation Assistance (HMA) programs, with regulatory guidance provided in 44 CFR § 201.6 *et seq*. FEMA outlines the following four major planning steps:

- **Step 1:** Organize Resources
- **Step 2:** Assess Risk
- **Step 3:** Develop a Mitigation Strategy
- **Step 4:** Adopt and Implement the Plan

Napa County and all other participating jurisdictions adhered to this FEMA four-step planning process. and added two additional steps, modeling the process on FEMA's HMP guidelines. The resulting six-phase planning process shown in Figure 2-1 was followed for the development of the 2026 MJHMP. In conjunction with and supplementary to the four-step process, Napa County and the City of Napa conducted the 10-step planning process pursuant to Community Rating System (CRS) program requirements. These additional steps are further described in the county's Flood Hazard Profile (Section 3.3.2) and the city's jurisdictional annex in Volume 2 of this plan.

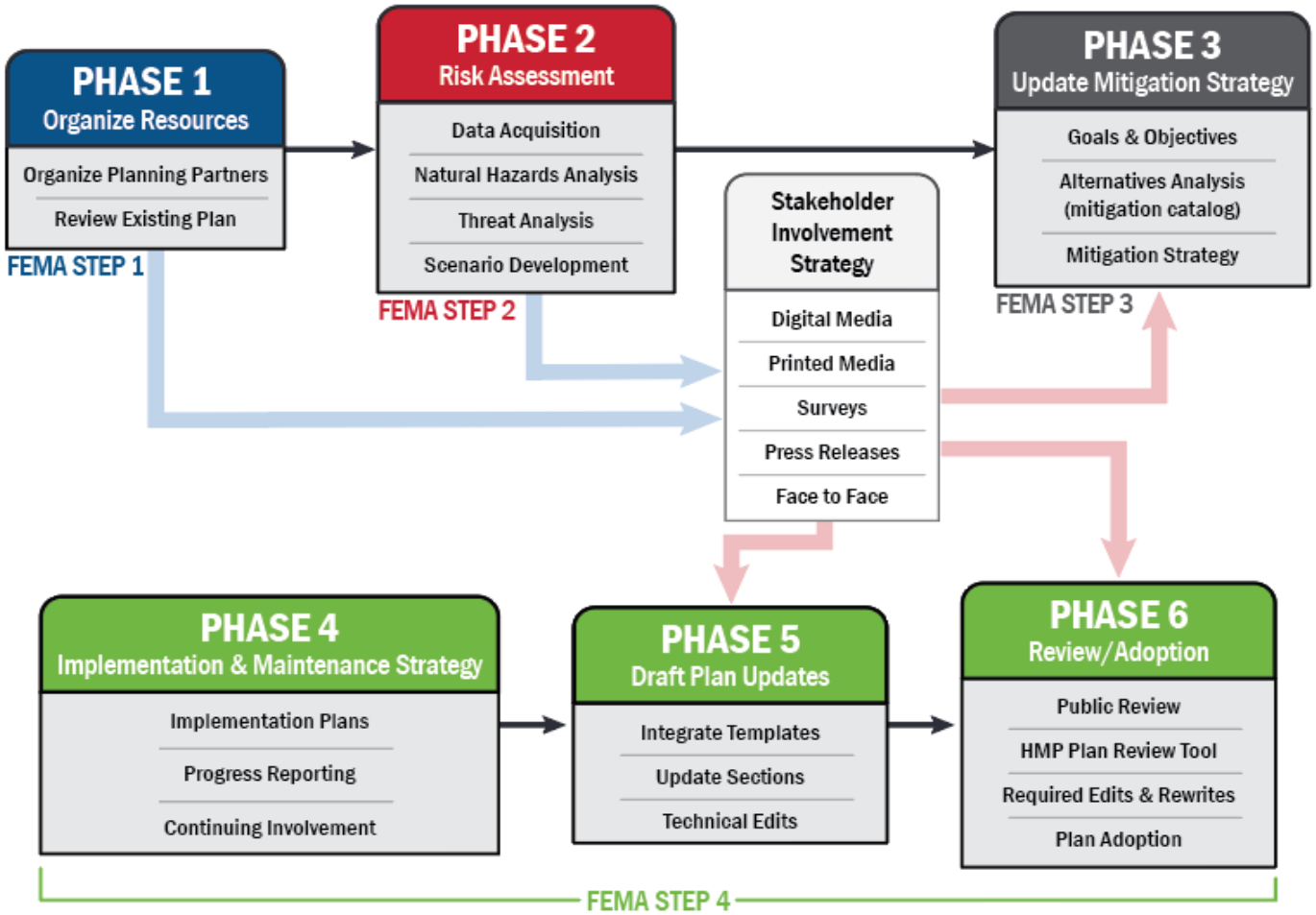


Figure 2-1: Planning Process Breakdown

Multi-Jurisdictional Planning Process

Multi-jurisdictional hazard mitigation planning offers many benefits, such as increased coordination and efficiency in planning and implementation efforts. At the same time, each jurisdiction has specific hazards and specific mitigation actions that must be individually addressed. This MJHMP balances the benefits of a comprehensive, coordinated approach to hazard mitigation with the specific realities of individual participating jurisdictions. Multi-jurisdictional plans are contemplated under FEMA regulations at 44 C.F.R. § 201.6(4).

While Volume 1 of this MJHMP documents the overall planning process, county-wide elements of the plan, and Napa County-specific information, Volume 2 documents each participating jurisdiction's unique hazards, assessment of vulnerabilities and capabilities, and mitigation strategy in a stand-alone annex. Each jurisdictional annex was created following the same planning process Napa County followed, as detailed in this section.

STEP 1: Organize Resources

The first step of the MJHMP planning process was organizing resources, consisting of engaging a wide range of stakeholders with local expertise, conducting extensive community outreach and engagement, reviewing relevant existing documents, and gathering and organizing information. Napa County and the other participating jurisdictions, assisted by the Consultant Team, used a highly interactive and comprehensive approach in organizing their available resources to ensure that this MJHMP is a living document and will evolve with community needs and priorities. Being flexible in this way will enhance the plan's effectiveness in mitigating local hazards and building resilience in communities across the county.

These various resources are summarized and organized in the following sections of the plan:

- **People and Expertise:** Section 2.1.1
- **Public and Stakeholder Engagement:** Section 2.1.2 and Appendix B
- **Planning Process Library:** Section 2.1.3

STEP 2: Assess the Risk

In accordance with FEMA requirements, the county-wide Hazard Mitigation Planning Team and each of the jurisdictional planning teams identified and prioritized the natural hazards affecting Napa County as a whole and each participating jurisdiction individually and assessed the vulnerabilities to those identified hazards. Results from the risk assessment aided subsequent identification of appropriate mitigation actions. The substance of the risk assessment is found in 0.

The process and support tools used, and the results of the risk assessment, are described in the following sections:

- **Community Profile:** Section 1.5
- **Hazard Screening and Prioritization:** Section 3.1
- **Vulnerability to Specific Hazards (Hazard Profiles):** Section 3.3
- **RAMP (Risk Assessment Mapping Platform):** Section 2.2.1
- **Vulnerability Assessment Methodology:** Section 2.2.2

STEP 3: Develop a Mitigation Strategy

The MJHMP was prepared in accordance with DMA 2000 plan update requirements, the California Office of Land Use and Climate Innovation (LCI), and FEMA's mitigation planning guidance. This document provides an explicit strategy and blueprint for reducing potential losses identified in the risk assessment based on existing authorities, policies, programs and resources, and participating jurisdictions' abilities to expand on and improve these existing tools. MJHMP development included identifying goals, assessing existing capabilities, reviewing the 2020 MJHMP goals, and identifying new mitigation actions. The substance of the mitigation strategy is detailed in Section 4 of Volume 1 for Napa County and in the Volume 2 annexes for all other participating jurisdictions.

This process, the tools used to support it, and the county results are found in the following sections of Volume 1:

- **Hazard Problem Statements:** Sections 2.3.1, 3.3 (within each Hazard Profile), and Section 4.5
- **Mitigation Goals:** Sections 2.3.2 and 4.1
- **Capabilities and Opportunities Assessment:** Sections 2.3.3 and 4.2
- **Identify and Prioritize Mitigation Actions:** Sections 2.3.4 and 4.3
- **Mitigation Action Plan:** Sections 4.4 (County-Wide) and 4.5 (Napa County)
- **Mitigation Action Support Tool (MAST):** Section 2.3.4.3

STEP 4: Adopt & Implement the Plan

Once the risk assessment and mitigation strategy were completed, information, data, and associated narratives were compiled into the MJHMP. The following sections describe the finalization, adoption, implementation, and update processes for the plan:

- **Adoption Proceedings and Records:** Section 2.4 and Executive Summary
- **Monitoring, Evaluating, and Updating:** Section 2.4.1
- **Plan Integration:** Sections 2.4.2 and 4.2 (Capabilities and Opportunities)

2.1 Organizing Resources

Napa County and other participating jurisdictions organized local people and expertise into four main levels and engaged stakeholders throughout the planning process. At the forefront of this effort was the Steering Group, with support from a Consultant Team and county-wide Hazard Mitigation Planning Team (HMPT), as well as the individual jurisdictions' planning teams. In addition, Napa County engaged with a wide variety of stakeholders and members of communities across the county to inform the development of this 2026 MJHMP. Some participating jurisdictions delegated most outreach efforts to the county while others chose to conduct additional public and stakeholder engagement activities on their own. A summary of the county's public and stakeholder engagement strategy and the results thereof are provided in Section 2.1.2 and documented in Appendix B.

2.1.1 People & Expertise

Organizing the people and expertise needed to develop this MJHMP was implemented by the Steering Group for this plan, which consisted of at least one lead contact for each participating jurisdiction. A six-step stakeholder engagement strategy was used to conduct this complex process within the larger organization task, as detailed in Section 2.1.2. Part of this engagement strategy included inviting neighboring jurisdictions and other regulatory agencies to share information and to discuss public safety and hazard mitigation concerns and priorities in a variety of capacities. Non-governmental stakeholders within the community, such as business leaders, civic groups, academia, non-profit organizations, major employers, and other interested parties, were also invited to participate. While engagement with some of these

stakeholders and the general public is described and documented in Section 2.1.2 and Appendix B, this section discusses those stakeholders who took an active and vital role in shaping this MJHMP from beginning to end.

In addition to the Steering Group, the development of this plan involved a county-wide Hazard Mitigation Planning Team, 13 smaller planning teams (one for each participating jurisdiction), many Key Stakeholders, and a Consultant Team that facilitated and documented the process. All the members of these groups are listed in Table 2-3 through Table 2-5 at the end of this section.



Steering Group

The Steering Group was at the core of the MJHMP planning process and was integral to ensuring its success. This group consisted of staff-level leadership and decisionmakers from each participating jurisdiction and worked closely with the Consultant Team throughout the development of this MJHMP, providing direction on the process and major plan components, including public and stakeholder engagement and the plan's future implementation and maintenance. Members of the Steering Group are listed in Table 2-3 and also doubled as members of the planning teams, which are discussed below and in the individual annexes of Volume 2.

Planning Teams

The development of this MJHMP was heavily influenced by the county-wide Hazard Mitigation Planning Team (HMPT or "Planning Team") as well as the smaller, internal planning teams of individual jurisdictions (e.g., County Planning Team). These teams consisted of members of the Steering Group, jurisdictional staff, and other stakeholders with specific local expertise to contribute to the planning process from each

participating jurisdiction. Planning team members represented public and private organizations within and adjacent to Napa County that possess knowledge about and regulatory authority over local public safety, development, and hazard conditions, issues, and priorities. They also served as data stewards and liaisons to the greater community.

Planning team members were chosen for their relevant expertise to develop a deeper understanding of hazard vulnerabilities, vulnerable and special needs populations, jurisdictional capabilities, and overall hazard perceptions across the planning area. Each planning team member was responsible for communicating the direction and status of the planning effort to respective departments and constituents of each jurisdiction and was expected to represent the perspectives of their jurisdiction on the county-wide HMPT. Table 2-3 provides a list of all the members of planning teams, many of which also participated in the county-wide HMPT. The planning team members for each participating jurisdiction are provided in their respective Volume 2 annex. The responsibilities of the HMPT and jurisdictional planning team members generally included:

- Participation in four structured HMPT meetings
- Participating in two jurisdiction-specific breakout meetings
- Contribution of detailed information and assisting in fulfilling data requests, when appropriate
- Input during the hazard selection and prioritization process
- Development of mitigation actions, progress, and priorities
- Review and comment on administrative drafts of the plan
- Coordination and promotion of community and stakeholder engagement efforts

Steering Group & Planning Team Meetings

The Steering Group, HMPT, and individual jurisdictional planning teams met throughout the development of the 2026 MJHMP, including a kickoff meeting, four county-wide HMPT meetings, and two series of jurisdictional breakout meetings, facilitated by the Consultant Team. Table 2-1 provides details of the county-wide Steering Group and HMPT meetings, including dates, topics discussed, and input goals.

County breakout meetings are summarized in Table 2-2, and details of other jurisdictional breakout meetings are located in the annexes of Volume 2. In addition to the two breakout meetings facilitated by the Consultant Team, some jurisdictions (including the Napa County) conducted additional breakout meetings, building upon Breakout Meetings #1 and #2 to better understand their risks, discuss and validate priorities, and further refine their mitigation strategy.

Meeting documentation, including agendas, sign-in sheets, hazard maps, PowerPoint presentations, minutes, and other relevant handouts, are provided in Appendix B. It is important to note that not all HMPT members necessarily attended all group meetings; some participated by reviewing draft documents or assisting in individual jurisdictional vulnerability assessments, with public outreach, or at other stages of the process.

Table 2-1: County-Wide Steering Group and Planning Team Meetings

Meeting & Date	Agenda / Topics	Goals / Key Inputs
County-Wide Steering Group Kickoff Meeting February 28, 2024	▪ Welcome and introductions ▪ Review roles and responsibilities ▪ Review project schedule and scope of work ▪ Review expectations of Steering Group, county-wide HMPT, and jurisdictional planning teams	▪ Shared project understanding ▪ Confirm roles and responsibilities
County-Wide HMPT Meeting #1 May 7, 2024	▪ Welcome and introductions ▪ Hazard mitigation background and basic information ▪ Overview of funding opportunities ▪ Review of previous plan and changes ▪ Mitigation successes in past 5 years ▪ Community engagement strategy ▪ Project schedule and expectations	▪ Shared project understanding ▪ Confirm roles and responsibilities ▪ Success stories ▪ Data requests
County-Wide HMPT Meeting #2 July 18, 2024	▪ Meeting #1 recap ▪ Community engagement progress and results ▪ Risk assessment and community vulnerability ▪ Demographics and vulnerable populations ▪ Overview of county-wide hazard risks and exposure ▪ Introduction to Risk Assessment Mapping Platform (RAMP) ▪ County-wide hazard risk ranking exercise ▪ Project schedule, updates, and breakout meetings series #1	▪ Identify county-wide hazard problems and areas of concern ▪ Identify and prioritize county-wide hazards ▪ Community engagement volunteers
Jurisdictional Planning Team Breakout Meetings Series #1 August 2024 – April 2025		
County-Wide HMPT Meeting #3 March 25, 2025	▪ Meeting #2 recap ▪ Breakout meetings series #1 summary ▪ Community engagement progress and results ▪ Previous plan mitigation goals and strategy review ▪ County-wide mitigation goals discussion ▪ Mitigation strategy design principles ▪ Project schedule, updates, and breakout meetings series #2	▪ Consensus on plan goals ▪ Understand mitigation strategy design principles ▪ Community engagement volunteers
Jurisdictional Planning Team Breakout Meetings Series #2 May – June 2025		
County-Wide HMPT Meeting #4 December 10, 2025	▪ Planning process recap ▪ Project schedule, updates, and draft review Community engagement progress and results ▪ Discussion of county-wide hazard problems ▪ Discussion of county-wide mitigation actions ▪ Plan implementation and maintenance	▪ Consensus on county-wide mitigation strategy ▪ Understand implementation and maintenance responsibilities

Table 2-2: Napa County Breakout Meetings

Meeting & Date	Agenda / Topics	Goals / Key Inputs
County-Wide Steering Group and HMPT Meetings #1 & #2 February – July 2024		
County Planning Team Breakout Meeting #1 November 11, 2024	▪ County-wide HMPT meetings #1 and #2 recaps ▪ Community engagement progress and results ▪ Risk assessment and community vulnerability ▪ Demographics and vulnerable populations ▪ Overview of jurisdiction-specific hazard risks and exposure ▪ Introduction to Risk Assessment Mapping Platform (RAMP) ▪ Jurisdiction-specific hazard risk ranking exercise ▪ Project schedule updates and next steps	▪ Consensus on jurisdiction-specific priority hazards ▪ Identify capabilities and potential mitigation actions ▪ Community engagement volunteers
County-Wide HMPT Meeting #3 March 2025		
County Planning Team Breakout Meeting #1.5 February 20, 2025	▪ Validate priority hazards ▪ Review areas of concern in RAMP ▪ Project schedule updates and next steps	▪ Consensus on jurisdiction-specific priority hazards and areas of concern
County Planning Team Breakout Meeting #2 June 11, 2025	▪ Breakout Meeting #1 and HMPT #3 recaps ▪ Review capabilities assessment ▪ Review areas of concern and define problem statements ▪ Principles of effective mitigation strategies and actions, and mitigation alternatives ▪ Refine and align jurisdiction-specific mitigation actions exercise ▪ Project schedule updates and next steps	▪ Consensus on jurisdiction-specific capabilities ▪ Consensus on jurisdiction-specific areas of concern ▪ Consensus on priority mitigation actions and collaboration opportunities ▪ Community engagement volunteers
County-Wide HMPT Meeting #4 December 2025		

Key Stakeholders

Key Stakeholders serve as liaisons to the greater community outside of the Steering Group and planning teams. These are people representing local, regional, state, and federal agencies involved in hazard mitigation or with the authority to regulate development, such as neighboring jurisdictions. Also included were representatives of local businesses, academia, community-based organizations and non-profits, and members of the public. Outreach with Key Stakeholders consisted of email correspondence, informal interviews, and community events, which covered topics such as basic project information, primary hazard concerns and front-line experience, needs and challenges of vulnerable populations, coordinating

engagement events, and advertising for the project. Organizations and individuals involved in the planning process as Key Stakeholders are listed in Table 2-4.

Many of the Key Stakeholders engaged represent agencies and organizations that support underserved communities and vulnerable populations, providing channels to those who are often most impacted by hazard events and with the least resources for disaster preparedness, response, or recovery. In particular, Key Stakeholders offered opportunities to engage with community members through known and trusted networks and voices, ensuring that people in all corners of the county and from all backgrounds were provided with opportunities to influence the 2026 MJHMP and mitigation strategy. Key Stakeholders were engaged by Napa County and the Consultant Team on behalf of each participating jurisdiction at various points during the planning process. These efforts and the findings thereof are summarized in Section 2.1.2 and documented in Appendix B.

Consultant Team

Napa County enlisted Dynamic Planning + Science (DP+S) as the Consultant Team to assist in the development of the 2026 MJHMP. DP+S was chosen based on its extensive experience and expertise in helping public sector entities with developing hazard mitigation plans. DP+S staff facilitated the planning process from start to finish, collected and analyzed local data, produced meeting and public engagement materials, and developed drafts of the MJHMP for review. The Consultant Team members are listed in Table 2-5 and consisted of a variety of hazard mitigation, data analysis, and certified planning professionals.

Table 2-3: Members of Steering Group and All Planning Teams

Name	Title	CRS Expertise	Department
Napa County			
Brieanna Jones	Emergency Services Officer	Emergency Management/ Public Safety	Office of Emergency Services
Andrew Eaman	Senior Information Systems Specialist	Public Information	Napa County GIS
Anthony Halstead	Director of Library Services & Community Outreach	Public Information	Library
Brian Bordona	Director of Planning, Building & Environmental Services	Planning/Zoning/Building/ Code Enforcement	Planning - Building & Environmental Services
Brian Ham		Emergency Management/ Public Safety	County Fire/CalFire
Casey LoCurto	GIS	Public Information	Napa County GIS/IT
Cullen Dodd	Undersheriff	Emergency Management/ Public Safety	Sheriff
Dave Cardwell	Assistant Superintendent Roads Division	Engineering/Public Works	Planning - Roads Division

Name	Title	CRS Expertise	Department
David Gludice	Chief Building Official	Building/Code Enforcement/CRS Coordination	Planning - Building & Environmental Services
David Kamlan	EMS Specialist	Emergency Management/ Public Safety	Emergency Medical Services
David Shew	Fire Administrator	Emergency Management/ Public Safety	
Doug Calhoun	Environmental Health Coordinator	Environmental Protection/ Public Health	Division of Environmental Health
Frank Lucido	Engineering Manager	Engineering/Public Works	Planning - Engineering
J.R. Rogers	Fire Administrator	Emergency Management/ Public Safety	Fire
James Bales	Cal Fire/Napa County Fire Marshall	Emergency Management/ Public Safety	Cal Fire / County Fire
Jason Martin	Cal Fire/Napa County Deputy Fire Chief	Emergency Management/ Public Safety	Cal Fire / County Fire
Jason Novak	Battalion Chief	Emergency Management/ Public Safety	Cal Fire
Jay Gardner	Chairman	Elected Official	Napa River Reclamation District #2109
JC Greenberg	Deputy Fire Chief	Emergency Management/ Public Safety	Fire
Jeff Skinner	Stormwater Program Manager	Engineering/Public Works/ Drainage	Stormwater Program
Jennifer Palmer	Director of Housing and Homeless Services	Public Health	Housing and Community Services
Jennifer Yasumoto	Health and Human Services Agency Director	Environmental Protection/ Public Health	Health and Human Services
John Tuteur	Assessor	Elected Official	Assessor
Jon Gjestvang	Chief Information Officer	Public Information	IT
Juan Arias	Deputy Director, County Engineering	Engineering/Public Works	Planning - Engineering
Katherine Bales	Assistant Airport Manager	Public Works	Public Works - Airport
Mark Witsoe	Airport Manager	Public Works	Public Works - Airport
Matt Lamborn	GIS Coordinator	Public Information	Planning - Building & Environmental Services
Matt Ryan		Emergency Management/ Public Safety	Fire
Michael Parker	Planning Manager	CRS Coordination/ Planning/Zoning	Planning - Building & Environmental Services
Oscar Ortiz	Sheriff	Emergency Management/ Public Safety	Sheriff

Name	Title	CRS Expertise	Department
Ryan Alsop	County Executive Officer	Emergency Management/ Public Safety	Cal Fire / County Fire
Shaun Vincent	EMS Administrator	Emergency Management/ Public Safety	Emergency Medical Services
Stacey Harrington	Environmental Health Manager	Environmental Protection/ Public Health	Planning - Building & Environmental Services
Steve Lederer	Public Works Director	CRS Coordination/Public Works	Public Works
Steve Stangland	Public Works Superintendent	Public Works	Public Works
Toosdi Malito	Assistant Agriculture Commissioner	Environmental Protection/ Public Health/Elected Official	Agriculture Commission
City of American Canyon			
Alexandra Ikeda	Deputy City Manager	Planning/Public Works/ Public Safety	City Manager
Dominic Patrick	Water Systems Manager	Engineering/Public Works	Maintenance & Utilities
Brent Cooper	Community Development Director	Planning/Zoning/Building/ Code Enforcement	Planning
Erica Ahmann Smithies	Public Works Director	Engineering/Public Works	Public Works
Ijeoma Njoku	Environmental Services Specialist	Environmental Protection/ Public Works	Maintenance & Utilities
Jason Holley	City Manager	Planning/Public Works/ Public Safety	City Manager
Joshua Anderson	Contract Building Official	Building/Code Enforcement	Planning
Rick Greenberg	Police Chief	Emergency Management/ Public Safety	Police
Will Harder	Maintenance Worker II	Engineering/Public Works	Public Works
City of Calistoga			
Jed Matcham	Fire Chief	Emergency Management/ Public Safety	Fire
Mitchell Celaya	Interim City Manager	Planning/Public Works/ Public Safety	City Manager
David Fradelizio	Associate Engineer	Engineering/Public Works	Public Works
Derek Rayner	Public Works Director	Engineering/Public Works	Public Works
Greg Desmond	Planning and Building Director	Planning/Zoning/Building/ Code Enforcement	Planning
Hamid Heidary	Senior Civil Engineer	Engineering/Public Works	Public Works
Jason Tamagni	Fire Captain	Emergency Management/ Public Safety	Fire

Name	Title	CRS Expertise	Department
Laura Snideman	City Manager	Planning/Public Works/ Public Safety	City Manager
Mark Woods	Building Official	Building/Code Enforcement	Planning & Building Department
City of Napa			
Zach Curren	Fire Chief	Emergency Management/ Public Safety	Fire
Brandon Veyna	Fire Prevention/Inspector	Emergency Management/ Public Safety	Fire
Charles Rhodes	Battalion Chief	Emergency Management/ Public Safety	Fire
Doug DeMaster	Senior Civil Engineer	Engineering/Public Works	Water
Ed Moore	Engineering Assistant	Engineering/Public Works	Public Works - Transportation Engineering
Jaina French	Community Relations & Media Manager	Public Information	City Manager
Jason Berens	Deputy Chief	Emergency Management/ Public Safety	Fire
Jason Williams	Chief Building Official	Building/Code Enforcement	Buildings
Jeff Gittings	Parks and Urban Forestry Manager	Parks and Recreation	Parks & Recreation
Joy Eldredge	Deputy Utilities Director	Engineering/Public Works	Utilities
Julie Lucido	Public Works Director	Engineering/Public Works/ CRS Coordination	Public Works
Kristopher Jenny	Lieutenant - Administration	Emergency Management/ Public Safety	Police
Magdiel Frayre	Parks, Trees & Facilities Supervisor	Parks and Recreation	Parks & Recreation
Matthew Price	Public Works Maintenance Superintendent	Engineering/Public Works	Public Works
Michael Walker	Senior Planner	Planning/Zoning	Community Development.
Molly Rattigan	Deputy City Manager/Interim Community Development Director	Planning/Zoning/Building/ Code Enforcement	Community Development
Paul O'Neill	Assistant Planner	Planning/Zoning	Planning
Phil Brun	Utilities Director	Engineering/Public Works	Utilities
Stephanie Emmons	Stormwater Program Coordinator	Engineering/Public Works/ Drainage	Public Works - Development Engineering

Name	Title	CRS Expertise	Department
Vincent Smith	Director Community Development	Planning/Zoning/Building/ Code Enforcement/CRS Coordination	Community Development
City of St. Helena			
Anil Comelo	City Manager	Planning/Public Works/ Public Safety	City Manager
John Sorenson	Fire Chief	Emergency Management/ Public Safety	Fire
Aaron Hecock	Senior Planner	Planning/Zoning	Community Development - Planning
Andrew Bradley	Program Manager	Planning/Public Works/ Public Safety	Consultant
Chris Hartley	Police Chief	Emergency Management/ Public Safety	Police
Dave Jahns	Parks & Recreation Director	Parks and Recreation	Community Services - Parks & Recreation
Jackie Oneal	Senior Planner	Planning/Zoning	Community Development - Planning
Joseph Leach	Public Works Director, City Engineer	Engineering/Public Works	Public Works
Justin Tharp	Lieutenant	Emergency Management/ Public Safety	Police
Lesley Milton	Deputy City Manager	Planning/Public Works/ Public Safety	City Manager
Mandy Kellogg	Administrative Services Director	Public Information	Administrative Services
Maya DeRosa	Planning and Building Director	Planning/Zoning/Building/ Code Enforcement	Community Development - Planning
Philip Henry	Chief Building Official	Building/Code Enforcement	Community Development - Building
Town of Yountville			
Hilary Gaede	Communications Director/ Town Clerk	Public Information	Town Clerk & Communications
John Ferons	Public Works Director	Engineering/Public Works/ Drainage	Public Works
Beatriz Becerra	Management Fellow	Planning/Public Works/ Public Safety	Town Manager
Brad Raulston	Town Manager	Planning/Public Works/ Public Safety	Town Manager
Diane Levine	Associate Planner	Planning/Zoning	Planning & Building
Irene Borba	Planning and Building Director	Planning/Zoning/Building/ Code Enforcement	Planning & Building
Jacob Solis	Engineering Tech - GIS	Public Information/Public Works	Planning & Building

Name	Title	CRS Expertise	Department
Mike Milat	Sergeant - Sheriff's Office	Emergency Management/ Public Safety	Sherrif
Nick Hickman	Water System Maintenance Worker II	Engineering/Public Works	Public Works
Rosalba Ramirez	Deputy Public Works Director	Engineering/Public Works	Public Works
Samantha Holland	Parks & Recreation Director	Parks and Recreation	Parks & Recreation
American Canyon Fire Protection District			
Geoff Belyea	Fire Chief	Emergency Management/ Public Safety	
Cliff Campbell	Assistant Fire Chief	Emergency Management/ Public Safety	
Howell Mountain Mutual Water Company			
Shannon Damonte	Administrative Manager	Public Information	
Tanner Hiers	General Manager	Planning/Public Works/ Public Safety	
Napa County Flood Control and Water Conservation District			
Andrew Butler	District Engineer	Engineering/Public Works/ Drainage	
Jeremy Sarrow	Watershed & Flood Control Operations Manager	Engineering/Public Works/ Drainage	
Leif Bryant	Logistics Chief	Engineering/Public Works/ Drainage	
Ross Murphy		Engineering/Public Works/ Drainage	
Phillip Miller	Deputy Director	Engineering/Public Works/ Drainage	
Richard Thomasser	Deputy Director of Public Works / District Manager	Engineering/Public Works/ Drainage	
Napa County Office of Education			
Joshua Schultz	Deputy Superintendent		
Allen Rossi	General Services Director	Planning/Public Works/ Public Safety	
Angel Hernandez	OES Officer	Emergency Management/ Public Safety	
Janet Tufts	Superintendent/Principal Howell Mountain School	Planning/Public Information	
Jeremy Smith	Director of General Services	Engineering/Public Works	
Julie McClure	Deputy Superintendent	Planning/Public Information	

Name	Title	CRS Expertise	Department
Rosanna Mucetti	Superintendent of Napa Valley Unified School District	Planning/Public Information	
Seana Wagner	Communications & Special Projects, Director	Public Information	
Napa Sanitation District			
Matthew Lemmon	Engineering Director / District Engineer	Engineering/Public Works/ Drainage	
Amy Walcker	Human Resources Manager	Public Information	
Andrew Damron	General Manager	Planning/Public Works	
Nick Hunter	Safety, Training and Fleet Maintenance Officer (STFMO)	Emergency Management/ Public Safety	
Napa Valley College			
Amber Wade	Chief of Police	Emergency Management/ Public Safety	
Miguel Vargas	Director of Facilities	Planning/Public Information	
Matt Christensen	Facilities Director	Planning/Public Information	
Samantha Maddox	Facilities Planning Manager	Planning/Public Works	
Napa Valley Transportation Authority			
Libby Payan	Senior Program Planner – Administrator	Planning/Public Works/ Public Information	
Danielle Schmitz	Deputy Executive Director	Planning/Public Information	
Dexter Cypress	Transit Planner	Planning/Public Works	
Rebecca Schenck	Transit Manager	Planning/Public Works	

Note: Jurisdiction leads in the Steering Group are presented in light purple rows with bold names.

Table 2-4: Key Stakeholders

Name	Title	Agency
Michael Cahill	Emergency Planning Consultant	MPCahill Solutions LLC

Table 2-5: Consultant Team Members

Name	Title	Project Role
Ethan Mobley, AICP	Owner / Principal Planner	Project Manager
Brian Greer	Co-Owner / Data Visualization Manager	GIS Lead / Data Analyst
Raini Ott, AICP, CFM	Principal Planner	Assistant Project Manager / Outreach Lead / Hazard Mitigation Planner
Cory Schreiner	Fire Prevention Service Manager	Assistant Project Manager / Hazard Mitigation Planner
Alex Krebs	Data Visualization Associate	GIS Assistant / Data Analyst
Cassidy Baumann	Planning Associate	Hazard Mitigation Planner / Data Analyst
Christopher Velasco	Senior Planner (former)	Outreach Assistant / Hazard Mitigation Planner

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2.1.2 Public & Stakeholder Engagement

Stakeholder engagement is a critical component in producing any effective and meaningful public planning process and actionable planning document, and public outreach is also a required component of the MJHMP. (44 CFR § 201.6(c)) As such, it is vital that early and continued engagement is facilitated through a diverse range of mediums to ensure community members, neighboring jurisdictions, and other stakeholders have an adequate opportunity to provide input, especially on the mitigation strategy.

The public and stakeholder engagement efforts deployed for this plan exceed the minimum state and federal requirements for outreach. But more than that, the engagement strategy was developed, implemented, and refined over the course of the MJHMP update planning process to ensure an abundance of enhanced opportunities for all types of community members to provide input.

By engaging with stakeholders and members of the public at specific points during the process, perspectives from an array of stakeholder categories were integrated throughout the MJHMP rather than being mentioned as an afterthought or an appendix. This extensive public and stakeholder engagement process and the results thereof are further described in this section and fully documented in Appendix B.

On behalf of all the participating jurisdictions, Napa County conducted outreach and engagement following a six-step strategy and work plan with support from the Consultant Team and county-wide HMPT. The outreach strategy for this 2026 MJHMP maximized stakeholder input and public involvement throughout the planning process, utilizing a diverse range of channels, mediums, and formats to ensure residents, business owners, and other community members were solicited for input on the plan from start to finish. Other community stakeholders, such as non-profits serving vulnerable populations, were also engaged using a variety of methods.



Implementation of the six-step strategy and work plan was conducted by the Steering Group and consisted of first identifying goals and the timeframe for engagement followed by identifying the planning team members, key stakeholders, tools, and resources to support the effort. Then a work plan was developed to organize the timeframe, teams, key stakeholders, and engagement tools and resources into a usable framework to guide the process toward accomplishing its stated goals. As the process progressed, it was continually assessed for its effectiveness and adjusted accordingly. This adaptive management approach ensured the engagement process supported the three goals identified in step one. In executing this engagement strategy and work plan, Napa County accomplished the following three goals:

1. Understand public safety and hazard concerns, problem areas, assets, and policy and mitigation priorities on a neighborhood scale, with intentional outreach to socially vulnerable and underserved populations, including Spanish-speaking residents and people with access and functional needs.
2. Provide accessible, inclusive information and tools — offered in multiple languages and formats — to community members, residents, and businesses to increase safety and decrease hazard risk at the private property level, ensuring engagement with socially vulnerable populations.
3. Collaborate with adjacent communities, special districts, utility providers, and other local and regional regulatory agencies providing public safety services, while prioritizing coordination that supports underserved and socially vulnerable populations.

The overall timeframe for public and stakeholder engagement stretched across the development of the MJHMP, occurring at regular intervals and important junctures. This schedule is illustrated below in Figure 2-2. Engagement efforts outside of the planning team meetings and breakout sessions discussed in Section

2.1.1, along with the various tools and resources used and the feedback gained from community members, are summarized in the following sections. Appendix B documents the outreach process, as required by FEMA, Cal OES, and the California Office of LCI.

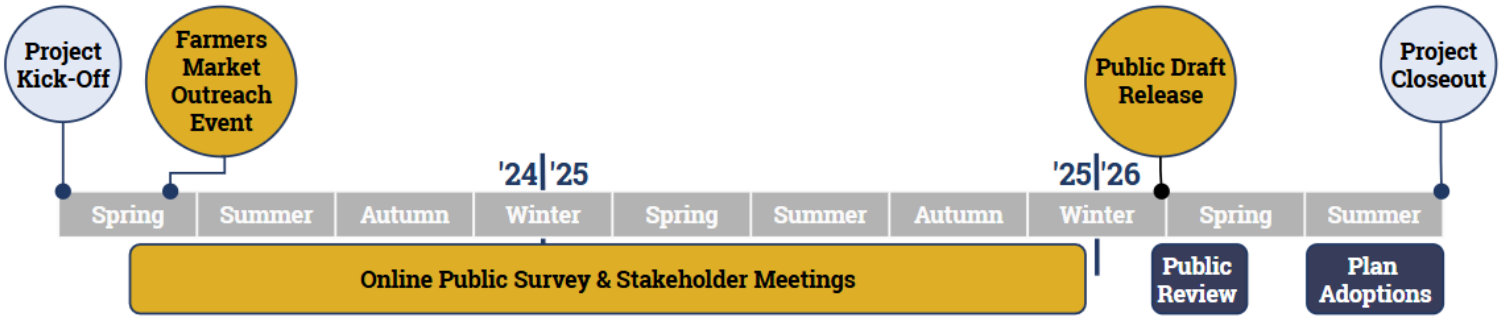


Figure 2-2: Overview of Public and Stakeholder Engagement Timeline

2.1.2.1 Outreach Tools & Resources

More than just informing the public of the plan's development, a good community engagement effort educates the public and motivates them to act. It must also be recognized that equal opportunity to participate does not result in equal participation. In every community, there are those who might otherwise engage but go unheard for various reasons, such as lack of internet access, time constraints, and/or childcare needs which may inhibit in-person engagement. It was Napa County's goal to identify and overcome these barriers and achieve equitable participation and meaningfully engage with the local community on their terms. The following tools and resources aided in achieving this.

Key Stakeholders

Because public safety and hazard issues are not tied to jurisdictional boundaries, Napa County consulted with a variety of stakeholders throughout the development of this MJHMP, as described in Step 1 of the planning process in Section 2. This included gathering jurisdictional staff and other stakeholders with specific local expertise to contribute to the planning process and forming the county-wide Hazard Mitigation Planning Team (HMPT) as well as internal planning teams for each jurisdiction. In addition, Napa County consulted with a range of Key Stakeholders that represented a broader range of local and regional agencies, including those that work closely with underserved and vulnerable populations.

Key Stakeholders consisted of people from a variety of public and private organizations within Napa County and the surrounding region that possess knowledge about local public safety and hazard conditions, issues, and priorities. These included representatives of local businesses, community-based and non-profit organizations, academia, and neighborhood groups (see Table 2-4). While some Key Stakeholders were involved in the HMPT or jurisdictional planning teams, others were engaged through different means, such

as emails and project announcements, informal interviews and phone calls, and collaboration on community engagement events.

Most importantly, Key Stakeholders that work with vulnerable populations and underserved communities provided critical channels and opportunities to meaningfully engage with those groups. Many of the Key Stakeholders consulted are trusted community figures and leaders, with voices that carry across language, cultural, and socioeconomic barriers to reach those who face some of the greatest risks and challenges in preparing for, responding to, and recovering from hazard events. By engaging with these community voices, Napa County and other jurisdictions were able to develop more comprehensive mitigation strategies that were not only tailored to local hazard conditions and capacities, but that also addressed some of the most pressing needs of their most vulnerable community members. In this way, Key Stakeholders were central in developing the MJHMP goals and mitigation strategies that will make Napa County safer and more resilient.

Websites, Social & Other Media

Napa County and the other participating jurisdictions used their websites, social media platforms, and other media to widely advertise the update of the MJHMP and solicit input from a diverse array of community members. In addition, a project portal was created through the Mitigate Hazards website maintained by the Consultant Team (mitigatehazards.com/napacountymjhmp), which served and will continue to serve as a centralized project information and file-sharing platform throughout the lifecycle of the plan. This website provides a tool for project management, collaborative content, and one-stop-shop for mitigation planning resources.



Project participants from each jurisdiction and key stakeholders used the website as a project resource for the duration of the planning process and will continue to have access during the five-year cycle and beyond. The page hosts secure information, including a point of contact database and a mapping application built specifically for mitigation planning called the Risk Assessment Mapping Platform (RAMP). RAMP allows for interactive discovery of the robust risk assessment data that was developed for the MJHMP. It displays facilities and buildings overlaid with natural hazards layers to bring interactivity and individual discovery to the GIS analysis performed for the plan. The website also hosts the Mitigation Action Support Tool (MAST) to help each jurisdiction track and update their mitigation strategy (see 2.3.4.3).

In addition to internal coordination, the project website played a critical role in community engagement throughout the planning process and documenting public involvement, including for the public survey, engagement events, planning team meetings and breakout sessions, and public review of the draft plan. Resources such as home-based mitigation measures, background documents, the Risk Assessment Mapping Platform (RAMP), links to meeting summaries, and the final plan are available to the public via the website.

Jurisdiction-maintained websites and social media are valuable and authoritative resources for the public that were used in addition to the project website to advertise the planning process and ways for community members to get involved. In general, users were directed from the jurisdiction websites and social media posts to the primary project website to avoid inactive or outdated information. Information on the MJHMP update was distributed through multiple social media platforms, such as Instagram and Facebook, using visually-oriented posts tailored to that jurisdiction's audience, often including posts in Spanish.

Alongside general project advertising, these websites, social media platforms, and local media outlets were used to publicize project milestones, the public survey, and community engagement events, as documented in Appendix B. The websites and media listed in Table 2-6 were used in the engagement effort.

Table 2-6: Summary of Community Outreach Media Tools

Jurisdiction / Agency	Media Tools Used	Example Links
Key Stakeholders and Other Partner Agencies		
KVON / The Vine	Radio advertisement regarding survey	Radio Website
Participating Jurisdictions		
Napa County	Newsletter, Facebook	November 2025 Newsletter November 2025 Facebook
City of Napa	Newsletter	December 2025 Newsletter
City of American Canyon		
City of Calistoga	Newsletter	November 2025 Newsletter
City of St. Helena	Newsletter, Instagram, Facebook	November 2025 Newsletter May 2026 Facebook
Town of Yountville	Newsletter, Instagram	November 2025 Newsletter November 2025 Instagram
Napa County Flood Control and Water Conservation District	See Napa County	
Napa County Office of Education	See Napa County	
Napa Valley College	See Napa County	
Howell Mountain Mutual Water Company	See Napa County	
Napa Valley Transportation Authority	See Napa County	
Napa Sanitation District	Facebook	December 2025 Facebook
American Canyon Fire Protection District	See Napa County	

Public Outreach Events

During the planning process, community outreach events were hosted across the county. These in-person public engagement events were generally scheduled in conjunction with existing community events to "piggyback" off their large attendance. Such events provided opportunities to go beyond other outreach efforts and engage members of the community who might not have otherwise participated in the planning process. Primarily, these events consisted of hosting tables at local famers' markets and making presentations at public meetings.

The main outreach event for this 2026 MJHMP was held at the City of Napa Farmers' Market on April 29, 2025 (Figure 2-3).



Figure 2-3: April 2025 Napa Farmers' Market Outreach Event

Online Public Survey

A primary tool used in informing the development of this MJHMP was an online survey, which provided an easy and powerful way of gathering qualitative and quantitative data to inform plan preparation. The survey was open to the public between April 2024 and February 2026, ending just prior to the release of the public draft for review, ensuring as many responses as possible were collected. The survey was distributed in both English and Spanish and was widely advertised across the county through the websites and other platforms of participating jurisdictions, Key Stakeholders, and other partner agencies. To incentivize greater public participation, Napa County offered all survey participants the chance to win a gift card towards a home mitigation item.

A total of 75 responses were received, which are summarized in Section 4.3 (Figure 4-2) and documented in Appendix B. As intended through a series of 16 questions, the results from the survey were used to gauge community members' knowledge of local hazards, perceptions of different hazards, greatest safety concerns, and mitigation priorities. These results were used to ensure that the priorities of Napa County and the other participating jurisdictions match those of their respective community members.

Interactive Meeting Materials

Napa County and the other participating jurisdictions, with assistance from the Consultant Team, conducted a series of county-wide and jurisdiction-specific planning team meetings (see Section 2, Step 1) and many community outreach events, as described elsewhere in this section. All of these meetings and most of the events were arranged in ways that were conducive to interactive engagement, providing enhanced opportunities for participants to learn and express their perceptions and priorities through a variety of tools.

The stakeholder and community feedback collected through interactive methods is documented in Appendix B. Examples of the tools and meeting materials that were used to create these engagement opportunities include:

- **Take-Home Cards:** Cards with important project information, such as the project website url and a QR code to the online survey or public draft review page.
- **Feedback Boards:** Prompts on large boards with mapping information or visualized data were provided to help collect public feedback. Community members were able to respond to the information on the board by attaching stickers or post-it notes, or by writing, drawing, or highlighting directly on it.
- **Hard Copy Surveys:** Hard copies of the survey were provided at events in both English and Spanish, to provide increased accessibility, especially for those who lack computer access or literacy.
- **Earthquake Kit Demonstration:** Using a custom display board, several in-home earthquake safety measures were made available for members of the public to interact with. The display board featured different ways to secure furniture and heavy objects like TVs, as well as museum putty to help keep fragile valuables such as glassware in place.

Public Review Period

After a complete draft of the MJHMP was developed based on the updated risk and capabilities assessments and on feedback from stakeholders and the public, community members across all participating jurisdictions were provided an opportunity to review and comment on the proposed hazard mitigation plan and strategy. This public review period was open for more than two weeks, between May 15 and June 2, 2026, and widely advertised through Napa County and other jurisdiction's websites, social media, and other media platforms.

Reviewers were directed to the project website where the draft MJHMP was provided in a collaborative PDF format to allow quick and easy live commenting. In addition, an online commenting form and direct emailing to the Steering Group via the Consultant Team were offered as options to give input on the draft. All comments received were reviewed and incorporated into the plan as appropriate.

2.1.2.2 Reaching Underserved Communities & Vulnerable Populations

As discussed in Section 1.5.3 of the Community Profile, there are populations in Napa County that are disproportionately impacted by hazard events than others, including Spanish-speakers, agricultural workers, seniors, and people with access and functional needs. Recognizing that traditional engagement methods, such as public hearings or submitting comments in emails or letters, are often inaccessible or intimidating ways to participate in the planning process, the engagement strategy for this MJHMP sought input directly from these communities and populations and from trusted voices within them through different means.

Partnering with Key Stakeholders to reach underserved and vulnerable populations through existing community lifelines and organizations was critical to understanding the concerns, needs, challenges, and priorities of these groups across Napa County. This was aided by the deployment of intentional outreach efforts using accessible and inclusive tools to engage residents in a variety of ways and on their own terms, including:

- **Translation of Materials:** Napa County translated all engagement materials into both English and Spanish, including content on the project website, the public survey, and social media posts in order to effectively exchange information with Spanish-speaking residents (Figure 2-4).
- **Utilization of Community Gathering Spaces:** Creating safe and welcoming environments for community members to participate in the planning process was a key component of successfully engaging with some of the vulnerable populations in Napa County. This was especially important to reach community members who were potentially fearful or distrusting of governmental organizations.
- **Virtual Participation:** Virtual participation through the online survey and the project website (e.g., to review the draft plan) were also offered to provide flexibility for Key Stakeholders and community members who were not able to attend in-person meetings or events due to inconvenience or other constraints.



Figure 2-4: Online Public Survey Advertisement in Spanish

2.1.2.3 Incorporating Public & Stakeholder Feedback

The stakeholder and public feedback gained through the various engagement efforts described in this section and Section 2, Step 1, shaped the development of the MJHMP from start to finish. The Steering Group, county-wide Hazard Mitigation Planning Team, and jurisdiction-specific planning teams laid the foundation for and provided critical input on the plan, including the history of hazard events, existing community conditions and hazard concerns, the successes of previous mitigation efforts, current capabilities and improvement opportunities, the overarching plan goals, and the final mitigation strategy. Key Stakeholders representing a range of interests, from neighboring jurisdictions to disproportionately impacted communities, were also instrumental in setting the tone and direction of the plan from the beginning.

Building upon the local expertise and experience of these formalized groups, Napa County and the other participating jurisdictions incorporated comments from the public throughout the plan to tailor the goals and mitigation strategy toward specific community concerns and needs. Public feedback was collected on an ongoing basis and at major injection points, such as the conclusion of the online survey and following the public review period. These results are fully documented in Appendix B, and Section 4.3 highlights key findings, including summarizing feedback gained from the public survey.

2.1.3 Planning Process Library

During the update process for this MJHMP, the Steering Group, county-wide HMPT, and each jurisdictional planning team engaged in and completed five different exercises to assess risk, prioritize hazards, identify areas of concern and hazard problems, assess existing capabilities and opportunities for improvement, and develop the mitigation strategy. These exercises, facilitated by the Steering Group and Consultant Team, were integral components of the planning team meetings described in Section 2.1.1. A description of each exercise and its purpose are provided below.

The outcomes of the five exercises completed by each participating jurisdiction are organized and documented in the form of a Planning Process Library (Table 2-7). Specific results from these exercises are incorporated into Volume 1 for Napa County; the results for other participating jurisdictions are further described in their Volume 2 annex.

Exercise #1: Risk Assessment

The risk assessment exercise aimed to thoroughly identify both county-wide and jurisdiction-specific vulnerabilities based on the best available data. Hazard overlay maps, demographics reports, and other tools were utilized to educate and engage stakeholders with deep-dive discussions on local hazard concerns and priorities, guiding the development of the risk assessment. This exercise was facilitated by the Steering Group and Consultant Team and engaged all the planning teams in reviewing and discussing the many factors that can impact community hazard risk. The Planning Process Library contains the snapshot hazard

maps for each participating jurisdiction and a county-wide demographics report that were refined through this exercise and formed the foundation for identifying and understand hazard risks.

Exercise #2: Hazard Prioritization

The county-wide HMPT and each of the jurisdictional planning teams considered and screened a broad range of hazards presented in relevant local, regional, and statewide hazard mitigation planning documents. The risk assessment (Exercise #1), past hazard events, and climate change projections also informed the selection of hazards for profiling in this plan. Each jurisdictional planning team then reviewed and prioritized all potential hazards, deciding which are most likely to happen (probability) vs how severe the impacts could be from an event (impact) (Figure 2-5). The crosswalk of documents reviewed, as well as the results of screening and prioritizing relevant hazards, are outlined in Section 3.1. The Planning Process Library contains the completed risk matrixes resulting from this exercise, ranking hazards based on probability in and potential impact on each participating jurisdiction.

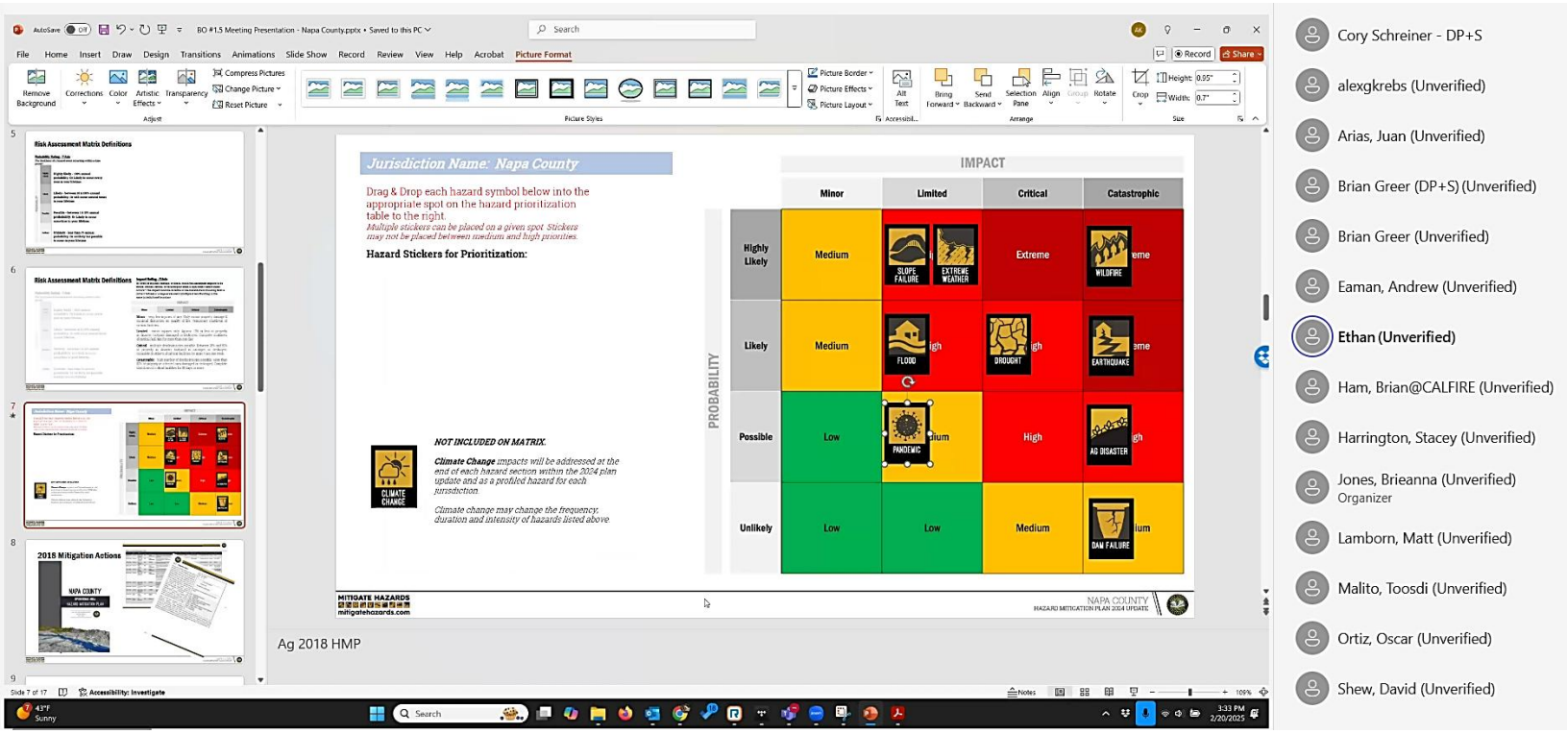


Figure 2-5: Napa County Planning Team Breakout Meeting #1.5 (Hazard Prioritization)

Exercise #3: Areas of Concern

All of the planning teams engaged in this exercise to identify areas of concern and the potential effects of each of the identified priority hazards on the planning area in terms of impacts, victims, or threats. Problem statements were developed for these areas of concern, which describe the specific nature of the consequences of a hazard occurrence on the community and its assets. This ensured that the mitigation

actions developed through the fifth exercise were tailored for each community and to the specific problems created by various hazard scenarios within it. The Planning Process Library contains the resulting problem statements for each jurisdiction.

Exercise #4: Capabilities & Opportunities Assessment

The capabilities and opportunities assessment exercise involved analyzing the existing planning and regulatory, administrative and technical, financial, and education and outreach resources of each participating jurisdiction, as well as opportunities for future improvement of those capabilities. Various tools are used to implement hazard mitigation activities, depending on that jurisdiction's authority, such as long-range planning documents; building, subdivision, and zoning regulations; trained staff; information systems; various funding mechanisms; and community preparedness education.

Each of the Steering Group members, supported by their planning team and the Consultant Team, evaluated their jurisdiction's current capabilities in comparison to previous mitigation planning efforts and provided updated information to reflect recent developments. As part of the exercise, they also explored opportunities to improve capabilities and the various funding options available to support implementation of their mitigation strategy. The Planning Process Library contains the resulting capabilities and opportunities assessment for each participating jurisdiction.

Review & Incorporation of Existing Documents

In organizing resources for the plan update, one of the initial steps was for each jurisdiction to identify and review their existing community plans, regulations, strategies, studies, and other documents with relevance to local community planning and hazards to help inform the development of the MJHMP. This effort was led by the Steering Group with support from the Consultant Team, county-wide HMPT, and jurisdictional planning teams. Many documents reviewed already incorporate hazard topics and mitigation planning while others, some seemingly unrelated, would be appropriate to integrate in the future. Relevant documents are cited throughout the MJHMP and in each hazard profile of the risk assessment.

As part of Exercises #1 through #4, the planning teams reviewed existing planning, policy, and regulatory documents for their relevance to hazard mitigation planning. The review included many documents into which previous mitigation plans are already incorporated, as reflected in the works cited, capabilities and opportunities assessment, and each the hazard profiles. Since the adoption of the 2020 MJHMP, Napa County and other jurisdictions have incorporated the plan into their various planning and regulatory mechanisms, including development standards and general, capital improvement, and hazard-specific plans.

The capabilities and opportunities assessment for each participating jurisdiction identifies the past and current usage of the documents found to be relevant to hazard mitigation, and opportunities for their future integration with the MJHMP directly or indirectly (Section 4.2). The documents were also closely examined as part of the hazard prioritization exercise completed by each jurisdiction's planning team. The objective

of this review was to ensure plan alignment with ongoing efforts, identify opportunities for integration, and avoid redundancy.

A summary of county-related documents which were identified, reviewed, and incorporated into this 2026 MJHMP, or that may be integrated with the county's hazard mitigation planning efforts in the future, is provided in the Planning Process Library and Section 2.1.3.

Exercise #5: Strategy Development

The final exercise conducted as part of the interactive and comprehensive development of this MJHMP was the creation of the mitigation strategies. Based on the results from all the previous exercises and background information surrounding them, including strategies from past mitigation plans, the Steering Group and Consultant Team led each of the planning teams through the review of potential mitigation actions and a variety of alternatives to consider for their particular jurisdiction during Breakout Meeting Series #2. Following individual strategy development, the county-wide HMPT met again to construct a collaborative mitigation strategy that leverages resources to address shared needs among all the jurisdictions to better protect Napa County as a whole (Figure 2-6).

The draft actions were then further refined by the Steering Group and jurisdictional leads to incorporate community feedback received during the public draft review period. The final county-wide and individual mitigation action plans are provided in the Planning Process Library. More details on the county-wide and Napa County strategies are found in Section 4, and the action plans for the other participating jurisdictions are found in the Volume 2 annexes.



Figure 2-6: County-Wide HMPT Meeting #4 (Strategy Development)

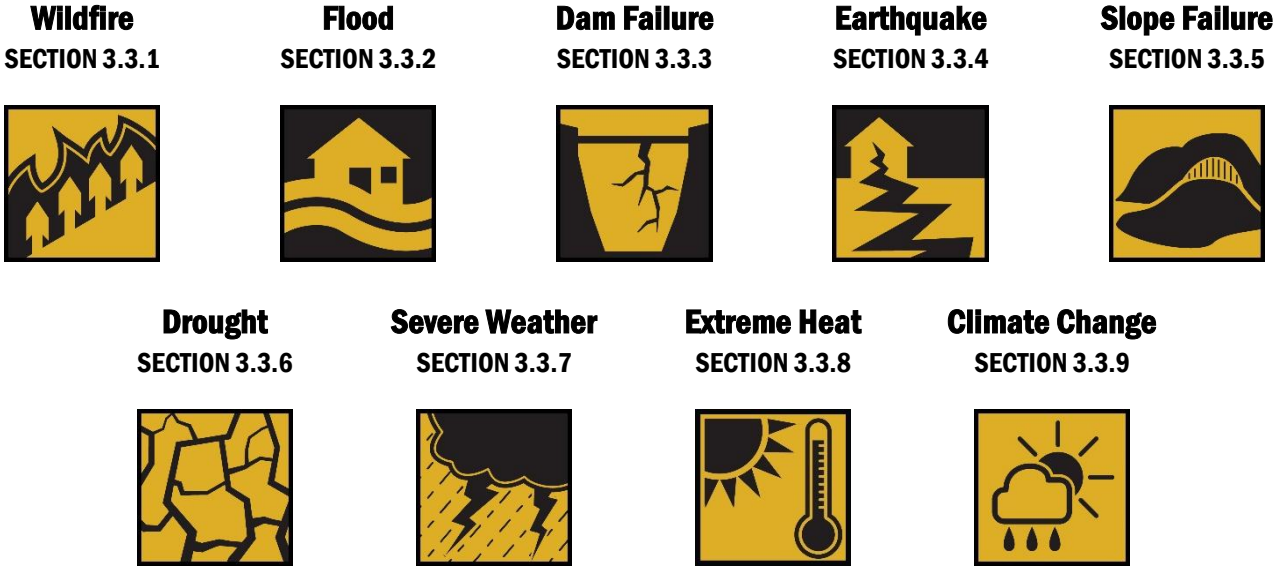
Table 2-7: Planning Process Library

Jurisdiction	Exercise No. / Title		Library Links
County-Wide	1	Risk Assessment	County-Wide Demographics Report
	2	Hazard Prioritization	County-Wide Risk Matrix
	5	Strategy Development	Table 4-3: County-Wide Mitigation Action Plan
Individual Jurisdictions	1	Risk Assessment	Hazard and Demographic Maps
	2	Hazard Prioritization	Risk Matrices
	3	Areas of Concern	Problem Statements
	4	Capabilities and Opportunities Assessment	Assessments
	5	Strategy Development	Alternatives Considered (see Action Plans for final Strategies)

2.2 Assessing Risk

This section describes the second major step in the planning process: the comprehensive assessment of risks associated with natural hazards in Napa County. The county-wide HMPT and each of the jurisdictional planning teams conducted a risk assessment for their planning areas. This involved identifying and prioritizing the natural hazards affecting Napa County as a whole and each participating jurisdiction individually, followed by assessing vulnerabilities to those identified hazards. Results from this risk assessment process aided the identification of an effective mitigation strategy.

The process for, and results from, identifying and prioritizing which hazards to assess are described in Sections 3.1 and 0. This section describes the procedures, methods, and support tools used in assessing the hazard risks to all the planning areas. The hazard-specific vulnerability assessments are documented in the nine hazard profiles.



Assessing risks and vulnerabilities exposes the unique characteristics of individual hazards and begins the process of narrowing down which areas within the county are vulnerable to specific hazard events. The vulnerability assessment included field visits and a Geographic Information System (GIS) overlaying method for examining such vulnerabilities more in depth. The planning teams of participating jurisdictions completed this exercise both singly and jointly with the county-wide HMPT. The hazards ultimately identified and prioritized varied widely depending on the geographic make up of, priorities of, and services provided by the individual participating jurisdiction. Using these methods, participating jurisdictions estimated the potential losses of populations, property, and facilities and infrastructure from their priority hazards.

The risk assessment process was conducted in alignment with FEMA's Local Mitigation Planning Handbook and used best practices to identify vulnerabilities in populations, property and private assets, and critical facilities and infrastructure.

The purpose of the risk assessment in Section 3 is to evaluate the locations and causes of the priority natural hazards affecting significant parts of the planning area, as well as the existing regulatory environment around them, their probability, the extent and severity of their potential impacts, and the vulnerabilities within the community. The findings serve as the foundation for developing targeted mitigation strategies that are both proactive and cost-effective. The risk assessment is comprised of the following:

- **Section 1.4, Community Profile:** Providing a geographic and demographic overview of Napa County as the basis for the assessment, highlighting the populations most vulnerable to hazards in the planning area.
- **Section 3.1, Hazard Identification & Prioritization:** Identifying hazards that pose the most significant threats and prioritizing them based on probability and potential impact in the county and other participating jurisdictions.
- **Section 3.3, Vulnerability to Specific Hazards (Hazard Profiles):** Detailing the characteristics, history, probability, and potential impacts of each hazard, including:
  - Exposure Analysis: Mapping or describing the populations, assets, and critical facilities and infrastructure exposed to each hazard.
  - Vulnerability Analysis: Assessing how susceptible different populations, structures, and other assets are to hazard impacts.

Risk assessment data is provided for all county-wide priority hazards and for Napa County, specifically, in 3.3 of this volume; other participating jurisdictions are profiled individually in Volume 2.

2.2.1 RAMP (Risk Assessment Mapping Platform)

A highly interactive, web-based mapping platform was used to assist in the vulnerability assessment. RAMP, the Risk Assessment Mapping Platform, is hosted by and accessed through the project website (mitigatehazards.com/napacountymjhmp) and allows the interactive discovery of robust risk, vulnerability, and exposure data developed especially for Napa County and the other participating jurisdictions. RAMP was built specifically for mitigation planning and is a vital tool in identifying hazard exposure and risk (Figure 2-7).

RAMP displays the total population, total parcels and property values, and a jurisdiction's facilities and buildings overlaid with natural hazards layers. Users can filter these layers by hazard and inventory type, as well as by jurisdiction. RAMP's robust data filtering and summation calculations allow the user to understand and visualize vulnerabilities at the property-level with detailed information on the number of people and structures exposed to various hazards. This brings interactivity and individual discovery to the GIS analysis performed for the vulnerability assessment, allowing for the exploration of various hazard risks posed within and around a community and, ultimately, aiding in the prioritization of mitigation resources.

RAMP enabled Napa County and the other participating jurisdictions to pinpoint their vulnerabilities and reinforce problem statements to support the mitigation strategy. The county-wide HMPT and each of the jurisdictional planning teams used RAMP in meetings and as needed to understand vulnerabilities both county-wide and to their planning areas, and especially to vulnerable populations and critical facilities and infrastructure.

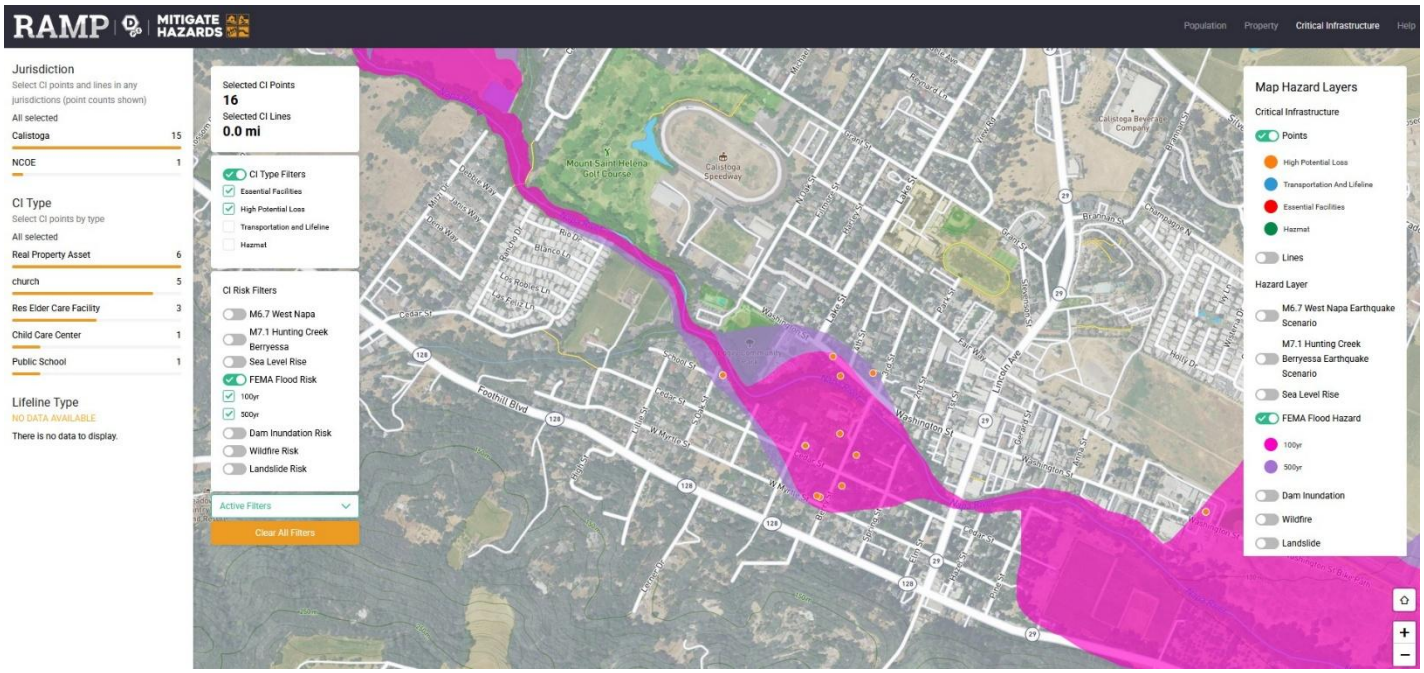


Figure 2-7: RAMP User Interface

2.2.2 Vulnerability Assessment Methodology

This subsection explains the methodologies used to assess vulnerabilities across the county and in individual communities. The approach includes both qualitative and quantitative analyses to evaluate the risks associated with specific hazards. Methodologies were selected based on FEMA guidelines, state-level best practices, and local policy and expertise to ensure accuracy and relevance, and all data sources used in the analysis meet standards appropriate for hazard mitigation planning. The vulnerability assessment includes:

- **GIS-Based Mapping:** Visually representing hazard-prone areas, critical infrastructure and facilities, and vulnerable populations.
- **Data Collection and Analysis:** Utilizing historical disaster data, climate projections, and demographic information to estimate risk.
- **Scenario Modeling (Earthquake and Climate Change):** Conducting hypothetical disaster scenarios to understand potential impacts under varying conditions, including climate change.
- **Community Surveys and Stakeholder Feedback:** Incorporating local knowledge to identify vulnerabilities not captured in traditional data.

This section also describes how the vulnerability assessment accounts for climate change impacts, which are expected to increase the frequency and severity of hazards like wildfire, flood, and extreme heat.

In order to describe vulnerability for each hazard, it is important to first understand the total population and assets at risk. This section provides an overview of the methods used in the hazard-specific vulnerability assessments of Section 3.3. For each type of hazard, the assessment begins with a general explanation of the phenomenon. Vulnerabilities to each hazard are then assessed through a two-step process. First, population, critical facilities and infrastructure, and all parcels across the county are inventoried to establish a comprehensive understanding of the area ("lay of the land"). Second, the inventories are used to calculate the exposure of and potential impacts to people and assets at various levels of severity. A more detailed explanation of the explanation on risk assessment methods, see Appendix A.

2.2.2.1 Population & Asset Inventory

This subsection details the process for developing the inventory of populations and assets that are vulnerable to hazard events. It includes the following examples:

- **Critical Facilities:** Hospitals, fire stations, police stations, and emergency shelters.
- **Critical Infrastructure:** Roads, bridges, utilities, and communication networks.
- **Essential Services:** Water treatment facilities, power plants, and public health facilities.
- **Vulnerable Populations:** Areas with high concentrations of elderly residents, disabled individuals, low-income households, and non-English-speaking communities.

The inventory was mapped using GIS tools to clearly illustrate hazard exposure and support data-driven decision-making for developing the mitigation strategies. The population and asset inventory provides a baseline to measure the significance of or vulnerability to natural hazard events. The asset inventory can also be used to estimate damages and financial losses expected during a "worst-case scenario" event for each hazard.

Each participating jurisdiction's assets have been inventoried to use as inputs for the vulnerability assessment, including people, parcels, property values, and critical facilities and infrastructure.

Population

The primary purpose of the MJHMP is to better protect people; thus, determining the population located near each geographically defined natural hazard is critical. The demographic data for Napa County and the other participating jurisdictions discussed is derived from the U.S. Census Bureau's American Community Survey 5-Year Estimates (ACS 5-Year) from 2017 to 2022. The figures presented are intended to highlight broader regional trends relevant to hazard mitigation planning efforts rather than inform specific decision-making or administrative actions.

Each natural hazard scenario affects county residents differently depending on the location of the hazard, the population characteristics and density where the hazard event could occur, and other local factors. In

the Community Profile, Section 1.5, specific characteristics of Napa County's population are discussed in detail, including highlighting which populations are most vulnerable to hazard events and impacts. The hazard-specific vulnerability assessments presented in the hazard profiles of Section 3.3 summarize the population exposure for each priority hazard, if definable.

Parcel Value Inventory

The Napa County Assessor's data was essential in identifying parcel and property value exposures to each priority hazard. The data includes 2023 to 2024 fair market values of at-risk private parcels and improvements as well as jurisdictional properties and assets. The parcel value inventory for Napa County is summarized in Table 2-8 and includes market value[1], content replacement value, and total assessed value ("total value"). These elements are called out in the table because, in the event of a disaster, the value of the infrastructure or improvements to the land is usually the focus of concern, as structures can be rebuilt or contents replaced. Although there may be severe environmental impacts that result from a hazard event, the land itself is generally not a total loss.

- **Total market value** as presented in this MJHMP reflects Napa County Assessor data, including fair market value where available. If no fair market value was available for a given property, the value reflects the assessed improvement value, which is often an underestimate of actual value.
- **Total content value** was calculated based on the Assessor's use codes, translated to occupancy-based multipliers.

Each occupancy class prescribes a specific content cost multiplier used to calculate the content cost values shown in the summary and in the hazard profiles in Section 3.3. Occupancy-based content cost multipliers used in this plan reflect those found in the FEMA HAZUS-MH (Hazards U.S. Multi-Hazard) 4.2 technical manuals.

The hazard profiles in Volume 1 outline predicted impacts to Napa County's parcel value inventory for each hazard's geographic extent. The annexes in Volume 2 contain the same information for other participating jurisdictions.

Table 2-8: Napa County Parcel Counts and Values

	Total Parcels	Total Market Value ($)	Total Content Value ($)	Total Value ($)
Unincorporated County	13,668	$11,215,199,644	$9,248,691,039	$20,463,890,683
American Canyon	7,245	$6,967,924,501	$7,565,767,223	$14,533,691,724
Calistoga	2,099	$1,062,206,651	$610,632,454	$1,672,839,105
City of Napa	36,814	$17,554,595,166	$14,323,871,166	$31,878,466,332
St Helena	3,000	$2,028,106,739	$1,390,754,675	$3,418,861,414

[1] Market Value Includes a long-term asset which indicates the cost of the constructed improvements to land, such as buildings, driveways, walkways, lighting, and parking lots.

	Total Parcels	Total Market Value ($)	Total Content Value ($)	Total Value ($)
Yountville	1,310	$617,098,970	$445,216,581	$1,062,315,551
Total Napa County	**64,136**	**$39,445,131,670**	**$33,584,933,139**	**$73,030,064,808**

Note: Parcel value is calculated by summing the value of all of the buildings on a given parcel. Each building's value is calculated by multiplying the square footage (Napa Assessor's Office) by a replacement cost of $425/sq ft . Content value calculated using content multipliers per HAZUS occupancy classes.

Critical Facilities & Infrastructure Inventory

Critical facilities and infrastructure, such as a fire station or bridge along an evacuation route, are of particular concern when conducting hazard mitigation planning. These critical assets can be structures, infrastructure, or other improvements that, because of their function, size, service area, or uniqueness, have the potential to cause disruption of vital socioeconomic activities if destroyed, damaged, or functionally impaired. As such, the vulnerability assessment for each profiled hazard qualitatively discusses critical facilities and infrastructure with regard to each hazard's severity footprint.

The critical facilities and infrastructure inventory for this MJHMP was developed from a variety of sources, including datasets from participating jurisdictions as well as state, federal, and private industry sources. Although the inventory is not comprehensive due to data limitations, all data sources have a level of accuracy acceptable for planning purposes. For additional information on sources, see Appendix A. Based on the inventory, a spatial database developed to translate this information into georeferenced[2] points and lifelines that represent physical locations.

- **Points** include critical facilities such as government buildings, police stations, fire stations, shelters, hospitals, elder care facilities, childcare facilities, schools, and transportation and utility structures. Points also include facilities that handle hazardous materials.
- **Lifelines** include critical infrastructure related to transportation routes; delivery of water, wastewater, electrical power, liquid fuel, and natural gas; and other crucial utility infrastructure lines.

Figure 2-8 provides an overview of the critical facility points and infrastructure lifelines located within the participating jurisdictions. Some critical facility information has been omitted from this document due to security concerns and requirements, and a detailed list of these assets is not provided. More detailed lists are on file with the individual jurisdictions that oversee those assets.

[2] To georeference something means to define its existence in physical space; that is, to establish its location in terms of map projections or coordinate systems. The term is used both when establishing the relation between raster or vector images and coordinates and when determining the spatial location of other geographical features.

2.2.2.2 Hazard Exposure

This subsection describes how the exposure of populations and assets to hazards was quantified. Damage estimation uses analytical tools to project financial impacts and loss estimations under various disaster scenarios and footprints. The analysis estimated potential damage based on factors such as:

- **Hazard Intensity and Frequency:** Historical data on past events, combined with climate projections.
- **Building Stock and Infrastructure Vulnerabilities:** Age, construction materials, and resilience of existing infrastructure.
- **Geographic Distribution:** Identification of floodplains, wildfire zones, landslide-prone areas, seismic fault lines, and other hazard areas with geospatial extents.
- **Socioeconomic Impacts:** Potential economic losses to businesses, critical services, and residential properties.

Alongside a study of past hazard events, geospatial data plays a critical role in these assessments by pinpointing the population and assets vulnerable to the hazards identified in this plan. This analysis is particularly effective when hazards have distinct spatial footprints that can be overlaid onto the locations of people and assets. In Napa County's planning area, such hazards as flood, wildfire, and earthquake have known geographic extents and corresponding spatial information; drought and severe weather hazards, on the other hand, impact large areas and do not have specific geospatial extents.

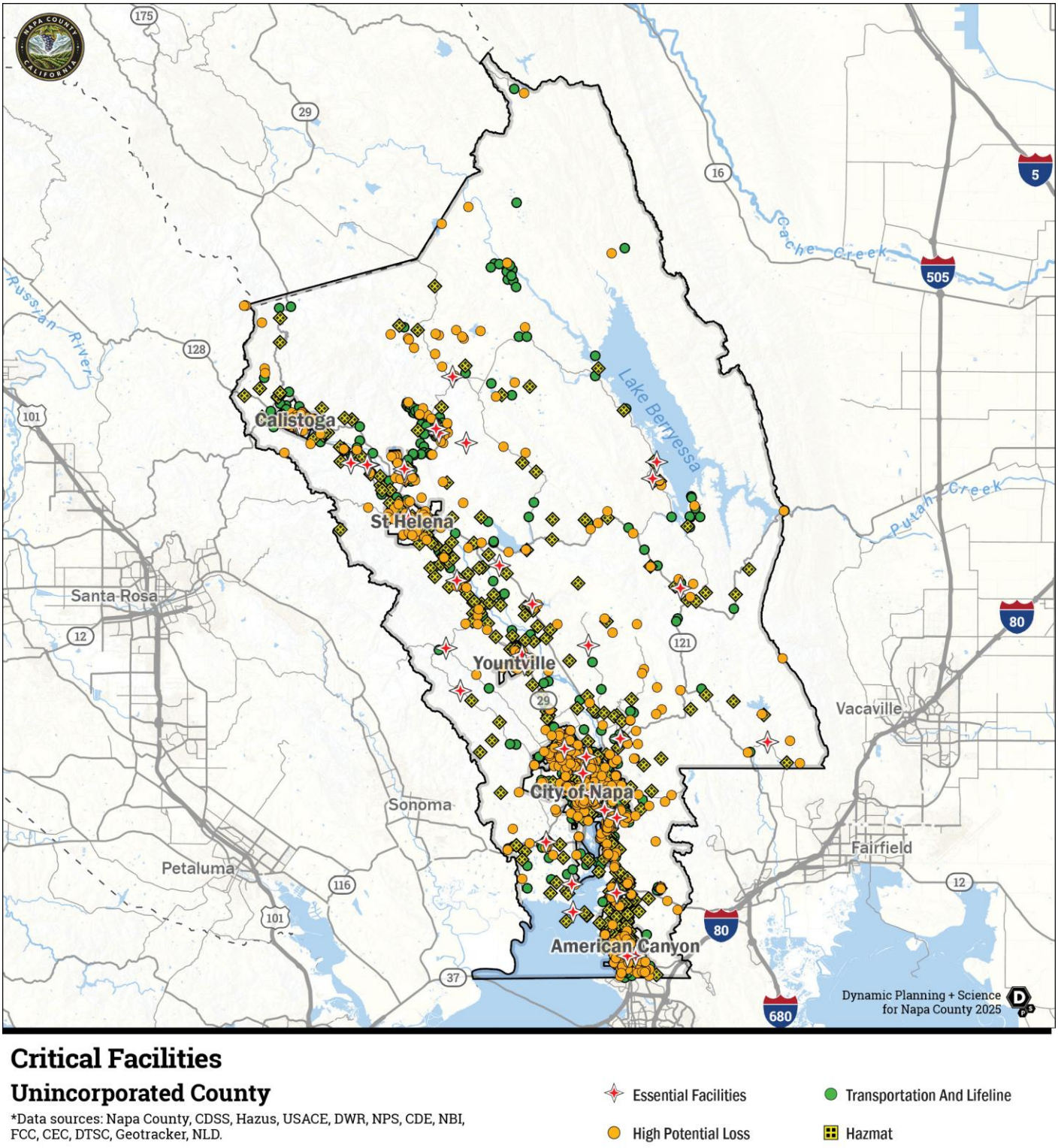
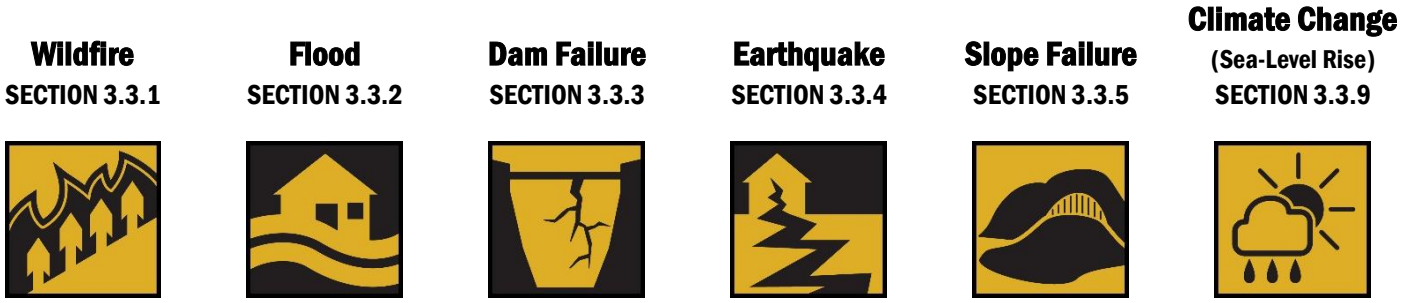


Figure 2-8: Critical Facilities Point Locations

Once the geographic extents of spatially-discreet hazards were established, the population and asset inventories were then used to generate specific exposure and damage estimations based on the severity of specific hazard event scenarios. The hazards in Napa County which have known geographic extends and corresponding spatial information, and thus have exposure and damage estimations, are:



Several data sources are necessary to conduct a thorough vulnerability analysis. Figure 2-9 provides an exhibit of the data inputs and outputs used to create the vulnerability analysis results presented in the hazard profiles of Section 3.3.

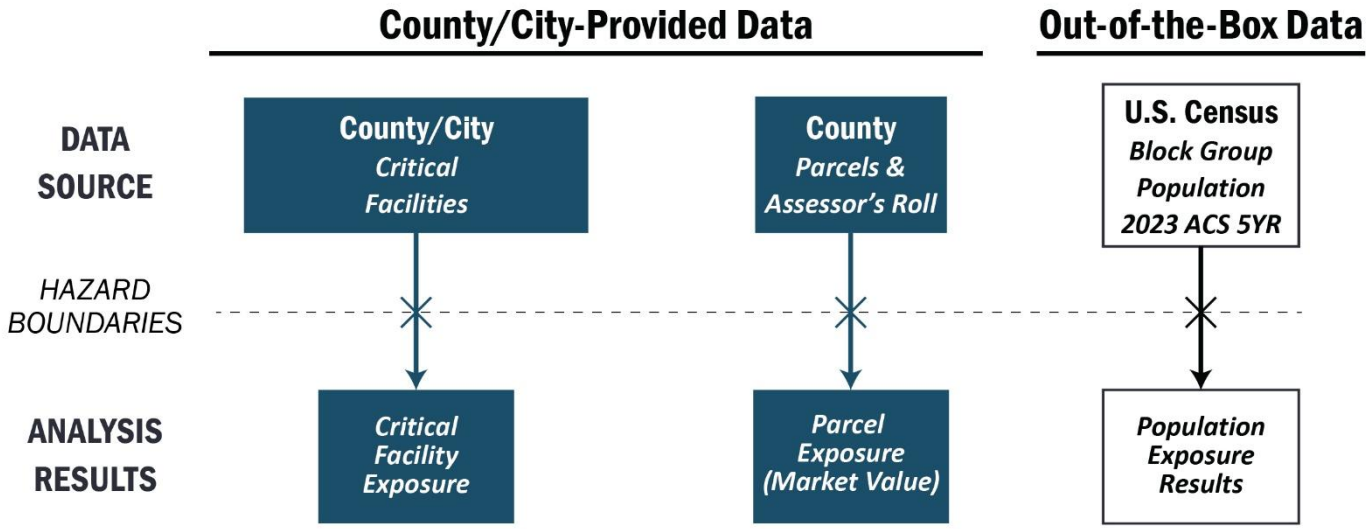


Figure 2-9: Data Inputs and Outputs



Figure 2-10: Hazard Exposure Explanation Graphic

Population & Asset Exposure

"Exposure" of assets and population refers to the total counts of people, parcels, facilities, and other assets within the planning area in which a hazard event may occur. A natural hazards overlay was developed to reflect the combination of many known natural hazard spatial footprints. The spatial overlay method enables summarization of building values, parcel counts, population, and critical facility and infrastructure exposure within a hazard's geographic extents. Exposure numbers were generated using Napa County Assessor information, address points, and parcel data for replacement and content cost estimates. See Figure 2-10 as a hypothetical exposure to flood hazards.

2.3 Developing a Mitigation Strategy

This MJHMP was prepared in accordance with DMA 2000 plan update requirements, FEMA's mitigation guidance, Cal OES policies, and the California Office of Land Use and Climate Innovation (LCI) recommendations. The development of this plan included identifying hazard problems across the planning area, setting goals for a mitigation strategy, assessing existing capabilities, considering the costs and benefits of alternatives, and developing new and improved mitigation actions.

Section 4 provides an explicit mitigation strategy and blueprint for reducing potential losses identified in the risk assessment based on the existing capabilities of Napa County; the same is provided in Volume 2 for each of the other participating jurisdictions.

2.3.1 Identify the Problem

As part of the mitigation action identification process, the HMPT and the jurisdictional planning teams identified areas of concern in and the potential impacts of each of the prioritized hazards, both county-wide and in their respective communities. Specific statements were developed to describe each jurisdiction's hazard problems based on the risk assessment contained in Section 3 and lengthy discussions about unmapped vulnerabilities. These "problem statements" are organized by three major areas of concern, which describe the nature of the consequences or effects of a hazard occurrence on the community and its assets as victim, impact, or threat. This categorization ensures that the identified actions in the mitigation strategy are tailored to each jurisdiction and the specific problems created by various hazard scenarios.

Each hazard problem statement that was developed is addressed by at least one mitigation action; however, most are mitigated with a combination of short- and long-range activities, through planning, regulatory, operational, physical, or other projects. Napa County's problem statements are identified at the end of each hazard profile in Section 3.3 and those of other participating jurisdictions are identified in their individual annexes in Volume 2.

The problem statements are also available as part of the Mitigation Action Support Tool (MAST), which is summarized in Section 2.3.5 and will be available via the project website throughout the plan's lifecycle to assist the participating jurisdictions in monitoring and improving the mitigation strategy.

Interpreting Areas of Concern (AOCs)

Areas of concern describe how hazards impact different aspects of a community and set the stage for identifying mitigation actions that reduce risk by changing the victims, impacts, or threats of different hazards. Each problem statement identifies which type of hazard problem (i.e., AOC) it concerns the most.







Victim *Who is (most) impacted?*	**Impact** *What are the direct and indirect impacts of hazard events?*	**Threat** *What local conditions create location-specific risk?*
Example Statement Seniors and people with mobility limitations lack adequate evacuation support during a fast-moving wildfire.	**Example Statement** Heavy rain events overwhelm aging and inadequate drainage infrastructure such as undersized culverts.	**Example Statement** FEMA floodplain maps do not reflect localized or future flood conditions, limiting the ability to plan for or fund effective mitigation.

2.3.2 Identify Mitigation Goals

Hazard mitigation plans must identify goals for reducing long-term vulnerabilities to identified hazards. (44 CFR § 201.6(c)(3)(i)) The county-wide HMPT and jurisdictional planning teams reviewed past mitigation goals from the 2020 Napa County MJHMP or their plan, as applicable, and from the 2023 California State Hazard Mitigation Plan (SHMP) and other relevant plans to determine their present validity. The teams also reviewed the updated risk assessment (Section 3.3) and public survey results (Section 4.3) in defining the goals for this plan.

The teams ultimately decided to keep and update the 2020 MJHMP goals, which were found to be consistent

with the current policies and goals of participating jurisdictions. The four resulting goals, which are presented in Section 4.1, formed the basis for the development of the Mitigation Strategy and specific mitigation actions.

2.3.3 Conduct Capabilities Assessment

A capabilities assessment is a comprehensive review of participating jurisdictions' existing capabilities to implement the mitigation actions in the MJHMP and tools available to address known issues and weaknesses from identified natural hazards. The Steering Group and planning teams identified their jurisdiction's capabilities to implement the mitigation strategy. These capabilities were also reviewed for future opportunities for integration or enhancement, including the development of new policies, expansion of training programs, and increased collaboration with regional and state partners.

Napa County's assessment of its capabilities and future opportunities is found in Volume 1, Section 4.2.2; Volume 2 of this plan includes assessments for all other participating jurisdictions as part of their specific annex. For more information on the regulatory environment surrounding each hazard, see the hazard profiles in Section 3.3.

2.3.4 Develop Mitigation Actions

The county-wide HMPT and jurisdictional planning teams developed mitigation actions, as both planning activities and other types of projects, to address identified hazard problems from the risk assessment in line with their capabilities. As part of this process, the teams reviewed and analyzed the status of mitigation actions from previous plans, determining which have been completed, which are no longer relevant, and which need to be updated to reflect current circumstances. Alternative actions considered and the final mitigation action plans adopted are provided as part of the Planning Process Library (Table 2-7).

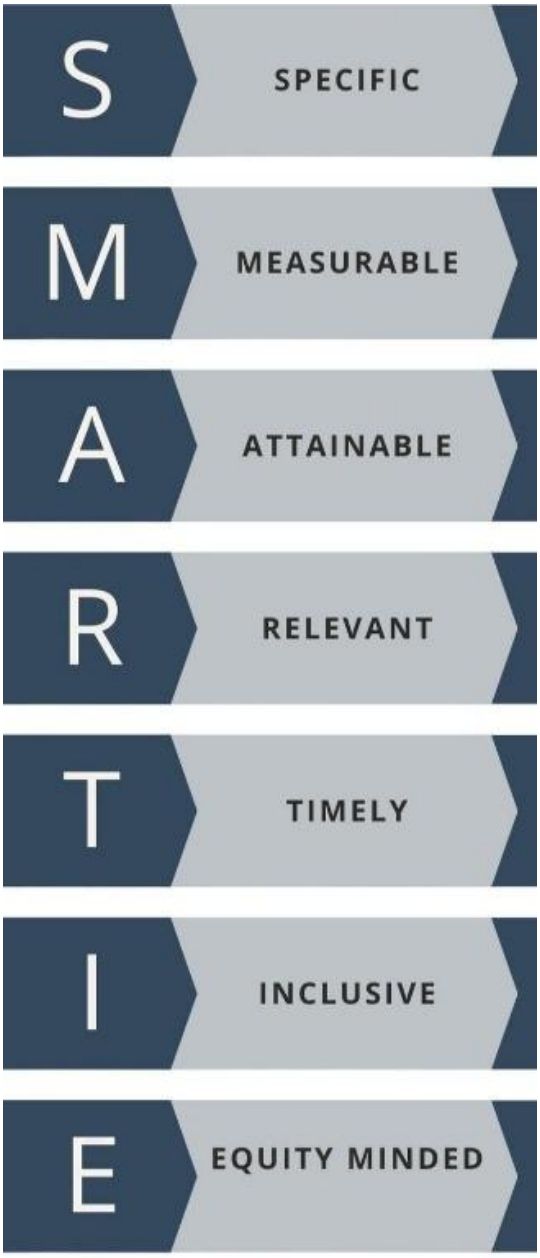
After reviewing mitigation actions from past hazard plans and priorities, projects, and activities other relevant documents, the planning teams developed potential new actions through interactive exercises and discussions, as outlined in Section 2.1.3. The potential mitigation actions were then further scrutinized based on their relevance to the priority hazards, support from community members, realistic implementation parameters, and alternative measures that could be used to address various aspects of the hazard problems.

2.3.4.1 Public & Stakeholder Input

As part of the mitigation strategy development, Napa County and the other participating jurisdictions reviewed and incorporated stakeholder feedback and public comments collected throughout the planning process to tailor the goals and mitigation actions toward specific community concerns and needs. Public input was collected on an ongoing basis via an online survey and at major injection points, such as during community outreach events and during the public review period. These engagement efforts and results are

fully documented in Appendix B and summarized in Section 2.1.2. Section 4.3 highlights public and stakeholder input that was specifically used in developing the mitigation strategies.

2.3.4.2 SMARTIE Principles



In developing the mitigation actions for this 2026 MJHMP, the planning teams used the principles of "SMARTIE" to ensure the mitigation strategy was realistic and actionable. These principles provided a framework for defining actions and evaluating their costs and benefits. A mitigation action that meets SMARTIE principles is:

- **Specific:** Clearly defined project scope and goals.
- **Measurable:** Outcomes and milestones can be tracked.
- **Attainable:** Designed to align with the agency's capabilities or those of partners.
- **Relevant:** Tied directly to risks identified in the plan.
- **Timely:** Includes deadlines for completion.
- **Inclusive:** Intentionally involves or benefit diverse populations.
- **Equity Minded:** Acknowledges impacts to access and functional needs populations and other special considerations.

2.3.4.3 Mitigation Alternatives

Once hazard problems were defined (problem statements) and local resources and capabilities accounted for (capabilities assessment), a range of mitigation solutions are identified that could be used to address concerns. These mitigation alternatives are evaluated for their associated costs and benefits to pinpoint which actions provide the greatest risk reduction using available resources and should be made part of the final mitigation strategy. This section describes the process that was used in identifying and evaluating a range of mitigation alternatives to address the hazards prioritized in the risk assessment (0). Alternatives include both structural measures (e.g., flood barriers, firebreaks, seismic retrofitting) and non-structural measures (e.g., zoning changes, public education, early warning systems) and were assessed based on:

- SMARTIE Principles
- Cost-Effectiveness
- Community Acceptance
- Alignment with Mitigation Goals

The Consultant Team drafted many mitigation actions for each jurisdiction to consider, including refined actions from the previous mitigation plan, as applicable, and new alternative actions. FEMA's six broad mitigation categories, listed below, provide the framework for identifying and evaluating potential mitigation actions. Categorizing mitigation actions in this way ensures a comprehensive approach to mitigation in the county, addressing various facets of vulnerability reduction and resilience enhancement across the community and its natural environment.

- **Prevention (PRV):** Measures aimed at avoiding or minimizing hazard impacts through planning and the implementation of building codes, land use regulations, and other preventative measures.
- **Property Protection (PPRO):** Actions to safeguard individual properties from hazard damage by modifying or relocating existing buildings and structures to enhance resilience.
- **Public Education and Awareness (PE&A):** Efforts to engage and inform community members about hazard risks and effective mitigation strategies to foster preparedness and resilience.
- **Natural Resource Protection (NRP):** Strategies that preserve, restore, or manage natural resources, systems, and functions to reduce hazard impacts.
- **Emergency Services (ES):** Measures that help minimize the impacts of hazard events on people and property by enhancing emergency preparedness and response capabilities.
- **Structural Projects (SP):** Projects to construct, install, or improve infrastructure and systems designed to reduce hazard impacts.

During Breakout Meeting Series #2 and HMPT Meeting #4, the planning teams drafted, evaluated, and refined mitigation actions that considered a wide range of implementation strategies, relevant to both county-wide needs and individual jurisdictions, using FEMA's six broad categories. Early discussions focused on reviewing previous mitigation strategies, identifying current hazard-related challenges, and developing potential actions to address priority hazard concerns. These ideas were then further reviewed and prioritized through collaborative sessions involving input from jurisdictional staff and a diverse group of stakeholders. The planning teams selected the most efficient and cost-effective actions by assessing vulnerabilities, evaluating existing capabilities, and building consensus on how best to address identified problems and meet the community's mitigation goals.

The final mitigation actions selected by each participating jurisdiction's planning team are presented in the Mitigation Action Plan. The Napa County Mitigation Action Plan is found in Volume 1, Section 4.5; action plans for all other participating jurisdictions are found in the Volume 2 annexes. In addition, the collaborative, County-Wide Mitigation Action Plan presented in Section 4.4 identifies combined efforts to address common hazard problems to increase the overall resilience of the county.

The following subsections provide examples of mitigation actions according to the six FEMA mitigation categories that were considered by the planning teams. This alternatives evaluation process is documented as part of the Planning Process Library discussed in Section 2.1.3 and provided in Table 2-7 (Alternatives Considered) to demonstrate transparency and support future funding applications.

PREVENTION (PRV)

Preventative (PRV) activities keep hazard problems from getting worse and are typically administered through government programs or regulations addressing building and land development. Preventative actions are particularly effective in reducing a community's future vulnerability in areas where development has not yet occurred or where capital improvements have not been substantial. Examples of preventative activities include:

- Planning and zoning ordinances
- Building codes
- Riverine or fault zone setbacks
- Open space preservation
- Floodplain regulations
- Stormwater management regulations
- Drainage system maintenance
- Capital improvements programming

Examples of Local PRV Alternatives

- **Update Land Use and Development Regulations:** Revise development codes and standards to better address natural hazards such as wildfire, flood, slope failure, drought, and climate change.
- **GIS and Hazard Mapping Enhancements:** Conduct detailed mapping for hazards such as flood and slope failure and expand GIS capabilities to increase utility of the data.
- **Restrict Development in High-Risk Zones:** Adopt policies to limit new development and capital investments in coastal and high wildfire risk zones.

PROPERTY PROTECTION (PPRO)

Property protection (PPRO) measures involve the modification, relocation, or removal of existing buildings and structures to help them better withstand the forces of a hazard. Examples include:

- Building elevation
- Retrofitting (e.g., seismic design techniques, etc.)
- Safe rooms, shutters, shatter resistant glass
- Insurance
- Critical facilities protection

Examples of Local PPRO Alternatives

- **Backup Power for Critical Facilities and Services:** Secure backup power supplies for emergency shelters, water treatment plants and pumps, and other critical facilities to ensure continuity of service during outages.
- **Structure Hardening Incentives:** Create a program that incentivizes private property owners to conduct structural improvements to protect homes, such as low-interest loans for elevation above the base flood or rebates for installing flashing and vents in high-risk wildfire zones.

PUBLIC EDUCATION & AWARENESS (PE&A)

Public education and awareness (PE&A) activities advise community members and elected officials about hazards, hazardous areas, and mitigation techniques they can use to protect themselves and their property. Measures to educate and inform the public include:

- Outreach projects, including neighborhood and community outreach
- Hazard mapping
- Materials library
- Speaker series/ demonstration events
- Real estate disclosures
- School children educational programs
- Hazard expositions

Examples of Local PE&A Alternatives

- **Hazard Awareness Events:** Develop annual community outreach events and educational activities to increase awareness of local hazards and mitigation strategies.
- **Water Conservation Campaign:** Develop a public outreach campaign to promote water conservation during drought conditions.
- **Flood Insurance Information:** Make National Flood Insurance Program (NFIP) and flood risk information available at public locations, such as libraries, and via a virtual planning desk.

NATURAL RESOURCE PROTECTION (NRP)

Natural resource protection (NRP) activities reduce the impacts of hazards by preserving or restoring natural areas and their protective functions. Such areas include floodplains, wetlands, steep slopes, and sand dunes. Parks, recreation, or conservation agencies and organizations often implement these protective measures. Examples of these measures include:

- Erosion and sediment control
- Floodplain protection
- Vegetation management (e.g., fire-resistant landscaping, fuel breaks)
- Watershed management
- Wetland and habitat preservation/restoration

Examples of Local NRP Alternatives

- **Groundwater Recharge Infrastructure:** Preserve and improve natural areas and ecosystems that support groundwater recharge to enhance water availability during drought conditions.
- **Fuel Management Projects:** Implement vegetation management strategies outlined in the CWPP, including thinning, prescribed burning, and invasive species removal.
- **Slope Stabilization Projects:** Develop a priority list of areas at high risk for slope failures, then implement stabilization projects using natural and engineered techniques to prevent landslides and erosion.

EMERGENCY SERVICES (ES)

Emergency services (ES), while not traditionally categorized as mitigation, play a critical role in minimizing the impacts of natural hazard events on people and property. These services focus on preparedness, response, and recovery efforts to protect lives, reduce damages, and ensure the continuity of critical operations. The measures often include pre-disaster planning, resource staging, and infrastructure improvements to enhance emergency response capabilities. Examples include:

- Warning systems
- Sandbag staging for flood protection
- Identification / construction of evacuation routes
- Installing temporary shutters on buildings for wind protection

Examples of Local ES Alternatives

- **Expand Emergency Shelter Capacity:** Work with partner jurisdictions to expand shelter capacity and improve shelter accessibility and safety across the county.
- **Communications System Improvements:** Improve the reliability and coverage of emergency communications and alter systems to ensure consistent messaging and enhanced interagency coordination during emergencies.

STRUCTURAL PROJECTS (SP)

Structural projects (SP) are intended to lessen the impacts of a hazard by modifying the environment and natural progression of a hazard event through construction. They are usually designed by engineers and managed or maintained by public works staff. Examples include:

- Utility facility / infrastructure upgrades
- Stormwater detention / retention facilities
- Dam Retrofits

Examples of Local SP Alternatives

- **Transportation Infrastructure Improvements:** Evaluate bridges, roads, and other transportation infrastructure located in high-hazard areas and implement improvements as necessary to ensure reliability of emergency access and evacuation routes.
- **Drainage Structure Replacement Program:** Develop an inventory of culverts and other drainage structures and establish a program for replacing and improving inadequate and failure-prone stormwater infrastructure.
- **Electrical Grid Hardening:** Collaborate with utility providers to harden electrical grid infrastructure against hazards such as high wind and wildfire, including burying power lines, installing reinforced poles or protective devices, and managing nearby trees.

2.3.4.4 Cost/Benefit Review

Mitigation action plans must be prioritized according to a cost/benefit analysis of the proposed projects and programs and their associated costs. (44 CFR §2 01.6(c)(3)(iii)) The benefits of proposed actions were weighed against estimated costs as part of the project prioritization process; however, it should be noted that this review does not meet FEMA Hazard Mitigation Grant Program (HMGP) and Pre-Disaster Mitigation (PDM) grant program requirements. A less formal, less costly approach was used because some projects may not be implemented for up to 10 years, and associated costs and benefits could change dramatically in that time. Parameters were established for assigning subjective ratings (high, medium, and low) to the costs and benefits of these projects.

Cost ratings were defined as follows:

- **High:** Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).
- **Medium:** The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.
- **Low:** The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.

Benefit ratings were defined as follows:

- **High:** Project will provide an immediate reduction of risk exposure for life and property.
- **Medium:** Project will have a long-term impact on the reduction of risk exposure for life and property, or project will not provide an immediate reduction in the risk exposure for property.
- **Low:** Long-term benefits of the project are difficult to quantify in the short-term.

Using this approach, projects with positive benefit versus cost ratios (such as high over high, high over medium, medium over low, etc.) were considered cost-beneficial and prioritized accordingly. For many of the strategies identified in this action plan, the partners may seek financial assistance under the HMGP or PDM programs, both of which require detailed benefit/cost analyses. These analyses will be performed on projects at the time of application using the FEMA benefit-cost model. For projects not seeking financial assistance from grant programs that require detailed analysis, the partners reserve the right to define "benefits" according to parameters that meet the goals and objectives of this MJHMP.

2.3.4.5 Prioritization Framework

In addition to considering public and stakeholder input and the initial cost/benefit analysis, mitigation actions were prioritized according to four criteria (see Section 4.3). This prioritization framework was developed by the Steering Group to further focus the individual and county-wide mitigation strategies on those efforts that address the most concerning hazards, can realistically achieve multiple outcomes, will have positive equity impacts, and align with existing jurisdictional strategies.

2.3.5 MAST (Mitigation Action Support Tool)

Development of the mitigation strategy for this 2026 MJHMP was strengthened by using an online platform called MAST, the Mitigation Action Support Tool. MAST is a web-based interactive tool that enables multiple users to search, view, enter, and update mitigation actions, ideas or projects, and other information.

As the planning cycle progresses, MAST will also be used to monitor and revise the mitigation strategy. As a living document, mitigation activities will be updated through this web interface application developed specifically for this 2026 MJHMP.

State & Federal Funding Application Assistance

Using MAST, participating jurisdictions can improve their ability to apply for state and federal funding, including in the initial grant application processes through Cal OES. MAST provides participating jurisdictions and plan reviewers (Cal OES and FEMA) easy access to mitigation action details that can be leveraged to support future risk reduction efforts and specific mitigation projects within the planning area. Additionally, MAST can be used to assist jurisdictions in tracking project progress for grant and other required reporting.

Monitoring & Evaluating the Strategy

As local circumstances change and the plan evolves, mitigation actions will be updated through MAST. The online interface provides jurisdictions the ability to easily record changes and progress and to make adjustments to the strategy as needed. MAST will assist mitigation project managers across all the participating jurisdictions in making adjustments reporting on the status and effectiveness of the mitigation action and overall strategy.

As described in Section 2.4.1, a county-wide advisory team will oversee the collection and review of progress reports on jurisdiction-specific strategies and will develop a county-wide progress report to deliver to the public and appropriate governing bodies annually. With MAST, updating the status and details of mitigation projects throughout the planning lifecycle will be greatly simplified and consolidated into one location.

2.4 Adopting & Implementing the Plan

Ensuring the MJHMP serves as a practical and accessible tool for Napa County and other participating jurisdictions is crucial for effective implementation and minimizing community hazard impacts. Section 2.4.2 describes the planning frameworks, maintaining ongoing public engagement, and establishing procedures for implementation, monitoring, evaluation, and regular updates to keep the plan current and responsive to evolving needs. These efforts aim to enhance resilience and safeguard community well-being against hazards.

Napa County and all participating jurisdictions adopted the plan in compliance with DMA 2000. See Adoptions Records in the Executive Summary of this plan.

2.4.1 Monitoring, Evaluating & Updating

This section describes the strategies for monitoring, evaluating, and updating the 2026 MJHMP throughout its lifecycle. Napa County and the other participating jurisdictions will monitor and adjust this plan in accordance with all FEMA and Cal OES requirements in order maintain eligibility for federal and state funding opportunities. The strategy includes designating an advisory team, monitoring progress and conducting annual reviews, continuing public and stakeholder engagement, and integrating the plan with other mechanisms to ensure its success.

2.4.1.1 Hazard Mitigation Advisory Team (HMAT)

The Steering Group oversaw the development of the 2026 MJHMP and made decisions on key elements of the plan, including the maintenance strategy; however, a Hazard Mitigation Advisory Team (HMAT) led by the Napa County Sheriff's Office will oversee the implementation phase of the five-year planning cycle. The primary roles of the HMAT in overseeing the implementation of the MJHMP are:

- Acting as a forum for hazard mitigation issues and continuing to solicit community input
- Facilitating interjurisdictional collaboration on hazard mitigation
- Coordinating implementation efforts across jurisdictions and partner agencies
- Reviewing annual progress reports and developing a county-wide progress report
- Tracking county-wide strategy progress and making recommendations on improvements

The HMAT will strive to include representation from all participating jurisdictions, Key Stakeholders and other partner agencies, and members of the public. Keeping the HMAT intact for the duration of the planning cycle will also assist in jump-starting the next plan update.

Duties of the HMAT

The HMAT will coordinate with the participating jurisdictions and other responsible parties for each county-wide mitigation action to assess its effectiveness and make modifications as appropriate. In addition, the HMAT will collect and review annual progress reports from participating jurisdictions and develop a county-wide report to provide input to the Napa County Board of Supervisors and, as appropriate, elected officials of other participating jurisdictions.

The progress reports will cover possible improvements to the county-wide and jurisdiction-specific strategies and changes to be considered at the next update, in addition to progress on mitigation actions. In evaluating the MJHMP's effectiveness, the following questions should be considered:

- Has the nature or magnitude of hazards affecting the planning area changed?
- Are there new hazards that have the potential to impact the planning area?
- Do the identified goals and actions address current and expected conditions?
- Have mitigation actions been implemented or completed?
- Has the implementation of identified mitigation actions resulted in expected outcomes?

- Are current resources adequate to implement the MJHMP?
- Should additional local resources be committed to address identified hazards?

Completion of the individual jurisdiction progress reports will be the responsibility of each participating jurisdiction annually. The reports will also be posted online for public review and released to the media. It will be the HMAT's role to help identify revisions and issues to be addressed by in the next update or other community plans.

The HMAT will also play a key role in preparing for the next MJHMP update by maintaining records and identifying emerging risks. Future updates to the plan will account for any new hazard vulnerabilities, special circumstances, or information or methodologies that become available. Issues that arise or updates made during the interim monitoring and evaluating period will be incorporated into the next update of the MJHMP, and the questions identified above will remain valid during its preparation.

2.4.1.2 Monitoring & Update Schedule

Monitoring the progress of mitigation actions will continue through the five-year period between adoption of this plan and the next update effort. The newly formed HMAT will meet annually, at a minimum, to monitor implementation, develop a progress and improvement report, and deliver that report to the Napa County Board of Supervisors and other jurisdictional decision-makers, as appropriate. The team's meeting schedule will be posted online, and meetings will be open to the public.

The MJHMP will be updated again after five years, as required by DMA 2000, and the update process will begin at least one year prior to the plan's expiration in 2031. However, should a significant hazard event occur within Napa County in the meantime, the HMAT will reconvene within 30 days of the disaster to review and update the plan as appropriate. As a DMA 2000 requirement, the County Board of Supervisors and decision-makers of other participating jurisdictions, as appropriate, will adopt any written updates.

5-Year Update

Future updates to the MJHMP will account for any new hazard vulnerabilities, special circumstances, or new information or methodologies that become available. Issues that arise or updates made during the interim monitoring and evaluating period will be incorporated into the next update of the MJHMP, and the questions identified above will remain valid during its preparation.

The next five-year update will follow the same four-step FEMA planning process used for this 2026 update, including public and stakeholder engagement through meetings and other means to inform changing risks and priorities. Led by the Napa County Sheriff's Office, the HMAT will initiate the process at least one year before the plan expires and, depending on the scope of the update, will procure outside consultation to guide the process as needed. The HMAT will review the 2026 plan and process undertaken and make adjustments to methods and tools to strengthen the next update effort.

As detailed in Section 2, FEMA's four hazard mitigation planning process steps that will be followed for the next update are:

- **Step 1:** Organize Resources
- **Step 2:** Assess Risk
- **Step 3:** Develop a Mitigation Strategy
- **Step 4:** Adopt and Implement the Plan

Funding Assistance Monitoring

The true worth of any mitigation plan is its implementation and success under grant and other funding programs. This MJHMP was assembled to reduce the risk of natural hazards and also to meet the requirements of DMA 2000 to maintain eligibility under FEMA's Hazard Mitigation Assistance (HMA) grant programs. FEMA's HMA Program is the catalyst that drives increased understanding and supports proactive community action to reduce losses from natural hazards. As discussed further under Section 4.2.3, FEMA administers several programs that provide funding for local agencies with approved mitigation plans, including:

- **Hazard Mitigation Grant Program (HMGP):** Assists in implementing long-term hazard mitigation planning and projects following a Presidential major disaster declaration.
- **Flood Mitigation Assistance (FMA):** Provides funds for planning and projects to reduce or eliminate risk of flood damage to buildings that are insured under the National Flood Insurance Program (NFIP) on an annual basis.

Post-Disaster HMGP Process

Following a disaster, Cal OES and Napa County officials would perform Preliminary Damage Assessments (PDA) of areas that sustained damage in a joint effort with FEMA. Cal OES then submits the information collected through the FEMA Regional Office, along with a damage estimate to request a declaration from the President. A Presidential Major Disaster Declaration provides for the availability of HMGP funds at the request of the Governor in eligible communities. Figure 2-11 shows a timeline of how projects should be developed and administered by local government and FEMA under the HMGP program. HMGP grant recipients have 36 months from the close of the application period to complete projects.



Figure 2-11: HMGP Timeline

Mitigation Action Support Tool (MAST) Updates

Hazard problem statements and mitigation activities will be updated through a web-based interface application developed specifically for the county and other participating jurisdictions, which is available on the project website. This Mitigation Action Support Tool (MAST) will assist jurisdictions in making adjustments to their mitigation strategy as circumstances evolve, and will assist mitigation project managers across all the participating jurisdictions in reporting on the status and effectiveness of the mitigation action and overall strategy. Plan maintenance will be primarily performed through MAST, with most updates to the MJHMP occurring easily through this tool. MAST is further described in Section 2.3.4.4.

2.4.1.3 Continuing Public & Stakeholder Engagement

The strategy for continuing engagement will utilize the same goals and resources as the strategy for developing the 2026 update, as described in Section 2.1.2 and documented in Appendix B. During the five-year planning cycle, the HMAT and individual jurisdictions will continue to involve members of the community in the implementation phase of the process through public gatherings, meetings, and workshops. In addition, the Key Stakeholders involved in this update and other partner organizations will be invaluable resources for supporting continued public engagement, especially with underserved populations.

An electronic copy of the 2026 MJHMP document will be accessible through the Napa County website and at the Napa County Sheriff's Office.

Information on events related to hazard mitigation or the MJHMP will be announced via the same media tools discussed in Section 2.1.2.1, including jurisdictional and partner websites, social media, and the project website (mitigatehazards.com/napacountymjhmp) and on the county's webpage.

2.4.2 Plan Integration

For the MJHMP to be successful, the recommendations and underlying principles of the plan should be incorporated into various aspects of local governance, including community planning and development (e.g., capital improvement budgeting) as well as everyday operations. Integration into a variety of departments and roles within the county and participating jurisdictions provides an opportunity to network, identify, and highlight mitigation activities and opportunities at all levels of government. It is also important to monitor resources and opportunities which can be leveraged to implement the mitigation strategy.

As the plan evolves, the following should be considerations for implementing and integrating the mitigation strategy:

1. **Use processes that already exist.** Take advantage of tools and procedures identified in the capability assessment in Section 4.2.2. Leaning on mechanisms already in use and familiar to participating jurisdictions will give the planning implementation phase a strong initial boost.

2. **Update work plans, policies, and procedures.** Incorporating hazard mitigation concepts and activities can help integrate the HMP into daily operations. These changes can include how major development projects are addressed in hazard-prone areas or can ensure that hazard mitigation concerns are considered in the approval of major capital improvement projects.
3. **Revise job descriptions.** Work with department or agency leads to revise job descriptions to include mitigation-related duties. Designating a "mitigation lead" within a department can further institutionalize hazard mitigation with little financial expenditure or programmatic overhaul.

The capabilities assessment for each participation jurisdiction identifies the past and current usage of various planning and regulatory mechanisms relevant to hazard mitigation, and opportunities for their future integration with the MJHMP directly or indirectly. This integration helps to ensure plan alignment with ongoing efforts, identify opportunities for integration, and avoid redundancy. In general, information from this MJHMP will be incorporated into:

- **General Plans:** The MJHMP will provide information that can be incorporated into the safety, land use, and other elements of general plans for the county and municipalities as they are updated, and many jurisdictions will update their safety element to incorporate the MJHMP in compliance with Assembly Bill (AB) 2140. Specific risk and vulnerability information from the MJHMP will also assist in identifying areas where development may be at risk to potential hazards for integration with land use, circulation, economic, and other elements.
- **Land Use and Development Regulations:** The MJHMP provides information that enables the county and other participating jurisdictions to make decisions on appropriate land use and development codes, such as zoning or construction standards which can increase resilience against natural disasters. Some participating jurisdictions' mitigation actions directly recommend updates to or adoption of new regulations to better address hazard risks.
- **Hazard and Other Specific Plans:** The MJHMP will provide information that can be incorporated into drought, water, and other specific or areas plans, and the MJHMP likewise captured mitigation actions derived from these types of documents. The MJHMP will provide risk assessment information that can be included in updates to groundwater, stormwater, floodplain management, and other plans. In addition, the MJHMP may be integrated with capital improvement, operational, maintenance, or emergency response plans with valuable information from this plan such as geospatial hazard footprints, exposure summaries, and damage estimations.

A summary of county-related mechanisms into which hazard mitigation and this 2026 MJHMP have been or could be incorporated is provided in the Capabilities and Opportunities Assessment, Section 4.2.2. Capabilities assessments for other participating jurisdictions are provided in the Volume 2 annexes.

Section 3. Risk Assessment

The risk assessment measures the potential impacts of hazards on life, property, and the economy within the Napa County planning area. The intent of a risk assessment is to identify the qualitative and quantitative vulnerabilities of a community to the greatest extent possible given available data. These assessments increase understanding of hazard impacts and provide the foundation to develop and prioritize mitigation actions. In turn, mitigation actions reduce damage from disasters through increased preparedness and focusing resources on areas of the greatest vulnerability.

This risk assessment section evaluates potential losses from a given hazard event by analyzing the vulnerabilities of buildings, infrastructure, and people. It identifies the characteristics and potential consequences of hazards, explores how much of the planning area could be affected by a hazard, and assesses the impacts on Napa County assets. Assessments for other participating jurisdictions are found in their individual annex in Volume 2. The risk assessment methodology used to analyze hazard vulnerabilities is described in Section 2.2 and Appendix A. The risk assessment approach consists of four components:

- Community Profile (Section 1.4)
- Hazard Identification and Screening (Section 3.1)
- Hazard Prioritization (Section 3.2)
- Vulnerability to Specific Hazards (Section 3.3)

The Community Profile in Section 1.4 offers a geographic and demographic overview of Napa County, highlighting detailed demographics of the community members most vulnerable to hazards. Each Volume 2 annex contains a similar discussion of that jurisdiction's characteristics. By tailoring risk-informed development to the needs of underrepresented communities, planners and policymakers can foster more resilient, equitable, and sustainable environments. This approach not only safeguards the most vulnerable populations but also enhances the overall resilience of the entire community.

3.1 Hazard Identification & Screening

Per FEMA guidance, the first step in developing the risk assessment is to identify which hazards should be the focus. Hazard selection is a twofold process. First, the planning teams considered and screened a broad set of hazards profiled in local, regional, and state-wide hazard planning documents. A crosswalk of this first step is outlined in Section 3.1.1. Second, the planning teams reviewed historic hazard events which had significant impacts on the planning area to inform the prioritization process, as summarized in Section 3.1.2.

3.1.1 Potential Hazards

The county-wide HMPT first reviewed previously-prepared hazard mitigation plans and other relevant documents to determine the realm of natural hazards that have the potential to affect the Napa County

planning area and nearby region. Table 3-1 provides a crosswalk of hazards identified in the 2020 Napa County MJHMP, 2023 Napa County General Plan Safety Element, and 2023 California State Hazard Mitigation Plan (SHMP). Ten different potential hazards were identified based on this thorough document review.

The crosswalk was used to develop a preliminary hazards list, providing a framework for HMPT to evaluate which hazards were truly relevant county-wide and which were not. For example, volcanoes were considered to have no relevance to Napa County, while earthquake, flood, and wildfire were indicated in every hazard document. The preliminary hazards list was then used as the basis for prioritizing which hazards should be profiled and analyzed in detail in this 2026 MJHMP, as discussed in Section 3.3.

Each planning team for other participating jurisdictions also completed this document review and crosswalk identifying potential hazards relevant to their individual jurisdiction, the results of which are reported in their Volume 2 annex.

Table 3-1: Document Review Crosswalk of Potential County-Wide Hazards

Hazard	2020 Napa County MJHMP	2023 Napa County Safety Element	2023 California SHMP
Agricultural Pests	■	■	■
Avalanche			■
Climate Change	■	■	■
Coastal			■
Dam Failure	■	■	■
Drought	■	■	■
Earthquake / Liquefaction	■	■	■
Extreme Cold			■
Extreme Heat			■
Extreme Weather / Storms	■	■	■
Flood	■	■	■
Geologic / Mass Movement	■	■	■
Human-Caused		■	■
Insects			■
Levee Failure			■
Pandemic Disease	■	■	■
Sea Level Rise			■
Soil			■
Subsidence			■
Tornado			■
Tsunami / Seiche Wave			■
Volcano			■
Wildfire	■	■	■

3.1.2 Past Major Hazard Events

One important consideration in identifying and prioritizing hazards is past major hazard events, especially those that triggered federal or state disaster declarations. The HMPT reviewed and considered past major hazard events in Napa County as part of the screening and identification process.

Most available information on major past hazard events comes from federal or state disaster declarations. These declarations may be granted when the severity and magnitude of an event surpasses the ability of the local government to respond and recover. Additional federal or state disaster funding (or both) is generally available in response to a disaster declaration. State funding assistance is provided when a local government's capacity to respond to the disaster is exceeded. Should the disaster be so severe that both the local and state governments' capacities are exceeded, a federal emergency or disaster declaration may be issued allowing for the provision of federal assistance.

The federal government may issue a disaster declaration through FEMA, the U.S. Department of Agriculture (USDA), and the Small Business Administration (SBA). FEMA also issues emergency declarations, which are more limited in scope and do not include the long-term federal recovery programs that accompany major disaster declarations. The quantity and types of damage are the determining factors.

A USDA disaster declaration occurs when agricultural areas are particularly impacted by an event. This type of declaration certifies that the affected county has suffered at least a 30% loss in one or more crop or livestock areas and provides affected producers with access to low-interest loans and other programs to help mitigate the impacts. Importantly, all counties neighboring those receiving USDA disaster declarations are eligible for the same assistance. Drought declarations may also occur through the USDA, as agricultural areas such as Napa County can be particularly impacted by drought. In recent history, Napa County has qualified for USDA assistance in 2020, 2021, and 2025.

Hazard events occurring outside the county can also directly or indirectly impact the planning area. For example, dam failures or wildfires may occur outside Napa County but either hazard event could affect watersheds that drain into it, resulting in flooding or longer-term watershed health impacts. Power supply also could be interrupted due to extraterritorial hazard occurrences.

Napa County has received 39 federal disaster declarations[3] since 1964, some of which were statewide. Figure summarizes the number of disaster declarations by type since 1964, and Table 3-2 lists the more recent declarations for Napa County since 1995. Wildfire, severe weather, and flooding events have caused the most declared disasters, accounting for 31 out of 39. Wildfires have historically occurred during the late summer and fall months, July to October, while severe weather and flooding events typically hit during the winter months, December through March.

[3] California was declared as part of Hurricane Katrina evacuation; however, no disaster occurred in California.

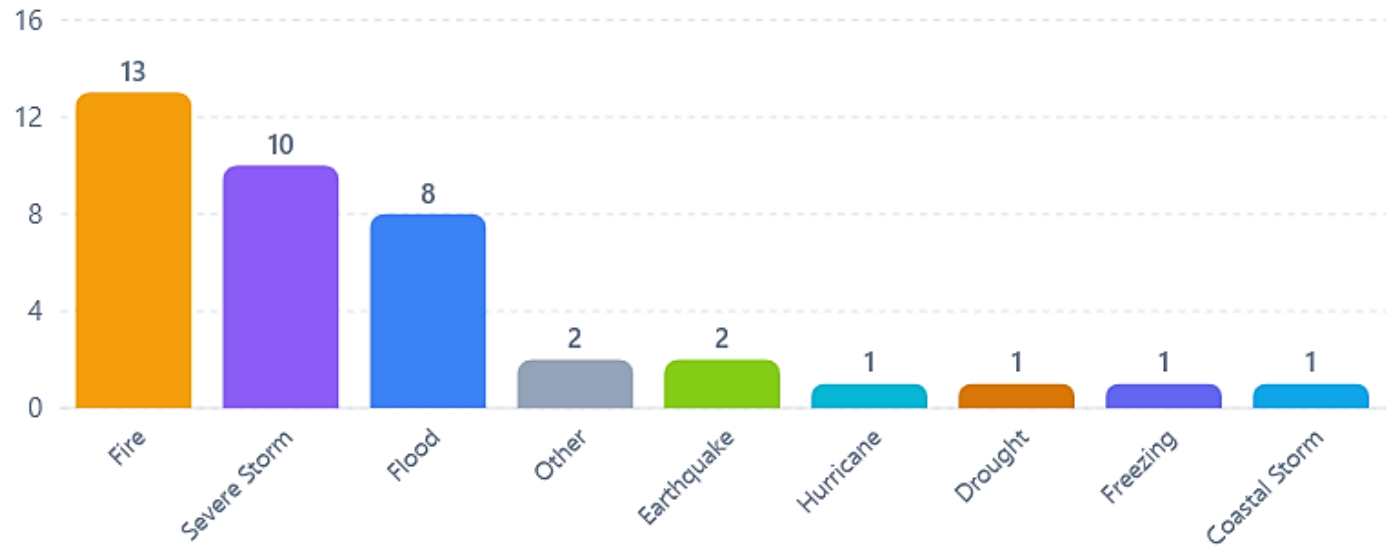


Figure 3-1: Napa County Federal Disaster Declarations by Hazard Type 1964 to Present

Table 3-2: Napa County Federal Disaster Declarations 1995 to Present

Year	Month / Day	Incident Description	Disaster No.
2023	04/02	Severe Winter Storms, Straight-Line Winds, Flooding, Landslides, & Mudslides	DR-4699-CA
2023	03/09	Severe Winter Storms, Flooding, Landslides, & Mudslides	EM-3592-CA
2023	01/13	Severe Winter Storms, Flooding, Landslides, & Mudslides	DR-4683-CA
2023	01/08	Severe Winter Storms, Flooding, & Mudslides	EM-3591-CA
2020	10/15	Wildfires	DR-4569-CA
2020	09/26	Glass Fire	FM-5376-CA
2020	08/21	Wildfires	DR-4558-CA
2020	08/17	Lnu Lightning Fire Complex	FM-5331-CA
2020	03/12; 03/21	Covid-19 Pandemic	EM-3428-CA/DR-4482-CA
2019	05/01; 05/17	Severe Storm, Winter Storm, Mud & Landslides, Flooding	DM-4431/4434
2017	10/09	California Atlas Fire	FM-5214
2017	10/09	California Patrick/Nuns Fire	FM-5222
2017	2/14; 3/16; 04/01	Severe Storm, Winter Storm, Mud & Landslides, Flooding	DM-4301/4305/4308
2017	10/08	California Tubbs Fire	FM-5215
2017	10/10	Wildfire	DM-4344
2015	07/23	California Wragg Fire	FM-5091
2015	09/13	California Valley Fire	FM-5112
2014	09/11	California Earthquake	DR-4193
2014	03/12	California Butts Fire	FM-5057
2008	06/22	Wildfire	DR-2776
2006	03/29	Severe Storm, Winter Storm, Mud & Landslides, Flooding	DR-1646
2006	12/17	Severe Storm, Winter Storm, Mud & Landslides, Flooding	DR-1628

Year	Month / Day	Incident Description	Disaster No.
2000	09/03	California Earthquake	DR-1342
1999	08/24	California Extreme Fire Hazards	EM-3140
1998	02/02	Severe Storms, Flooding	DR-1203
1997	02/16	Severe Storms, Flooding, Mud & Landslides	DR-1155
1995	01/03	Severe Storm, Winter Storm, Mud & Landslides, Flooding	DR-1044
1995	02/13	Severe Storm, Winter Storm, Mud & Landslides, Flooding	DR-1046

Source: FEMA Disaster Database

3.2 Hazard Prioritization

Based on review of past hazard events and existing plans, reports, and other technical studies, data, and information about hazards with the potential to affect Napa County, the county-wide HMPT determined the realm of regional hazards that could affect the planning area. From this preliminary list, the HMPT then completed a hazard risk ranking exercise (described in Section 2.1.3) to determine which hazards should be prioritized for assessment in this MJHMP and, consequently, which hazards should be the focus in the mitigation strategy.

The hazard prioritization process combines historical data, local knowledge, and consensus opinions to produce a risk matrix that illustrates whether each profiled hazard is an extreme, high, medium, or low priority for the planning area. Criteria for probability verses impact were also used to evaluate hazards and identify those that pose the highest risks.

Probability: What is the likelihood of an event?

- **Unlikely:** Less than a 1% annual probability, or occurs rarely
- **Possible:** Between 1% and 10% annual probability, or could occur but is uncommon
- **Likely:** Between 10% and 100% annual probability, or recurrent but not frequent
- **Highly Likely:** 100% or higher annual probability, or occurs frequently

Impact: In terms of deaths, injuries, damage, or disruption, what are the anticipated impacts?

- **Minor:** Very few or no injuries, only minor property damage, or minimal disruption of critical facilities and services
- **Limited:** Minor injuries only, 10% to 25% of property in affected area damaged or destroyed, or disruption of critical facilities and services for more than a day
- **Critical:** Multiple deaths or injuries possible, 25% to 50% of property in affected area damaged or destroyed, or disruption of critical facilities and services for more than a week
- **Catastrophic:** High number of deaths or injuries possible, more than 50% of property in affected area damaged or destroyed, or disruption of critical facilities and services for a month or more

The results of the risk ranking exercise for Napa County are identified in the county's Hazard Risk Matrix (Figure 3-2) and detailed in Table 3-4, which summarizes why the county-wide priority hazards were chosen and why other hazards were not prioritized. This hazard risk prioritization exercise was completed by the planning team for each of the participating jurisdictions, the results of which are described in the jurisdictional annexes of Volume 2.

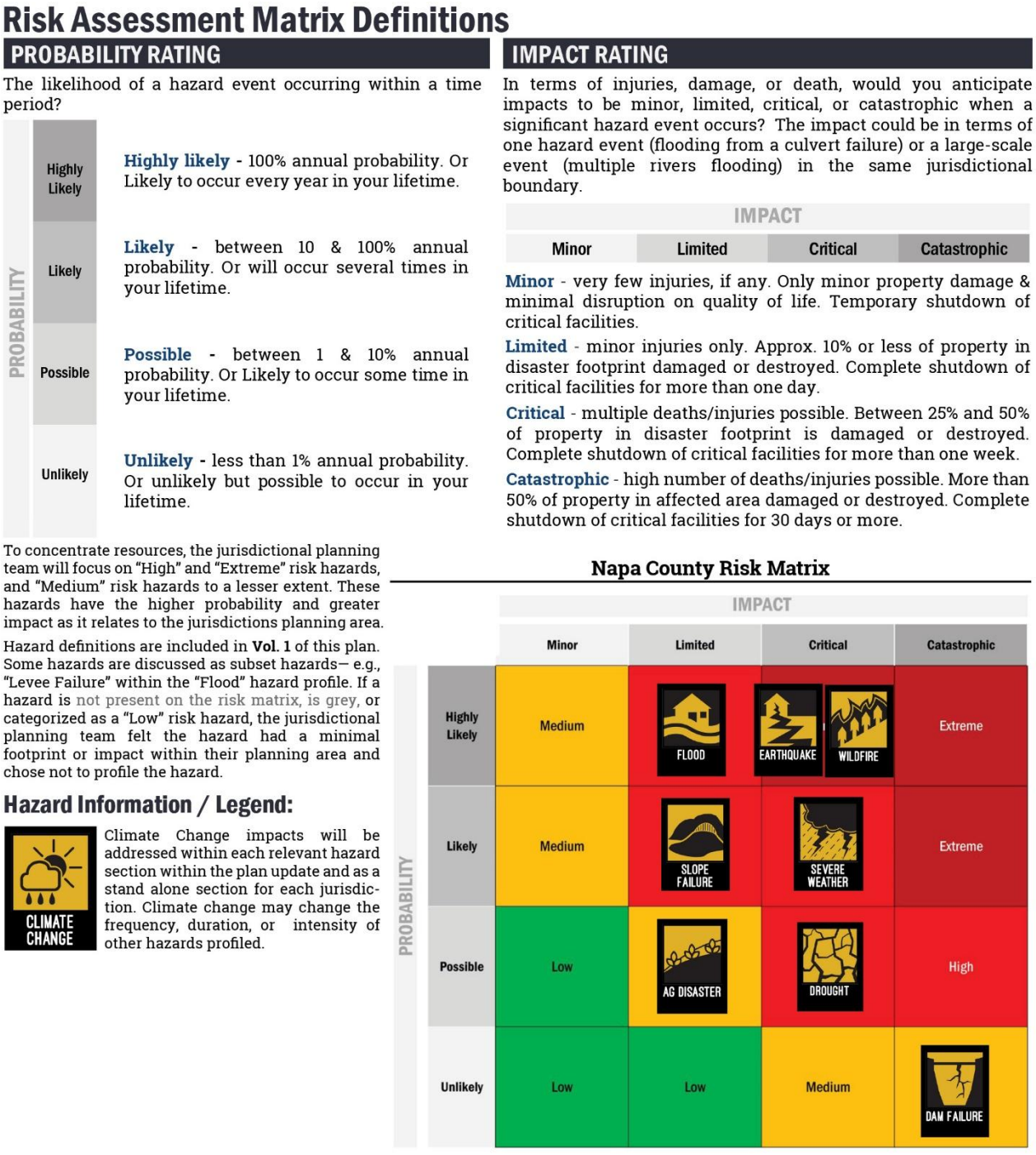


Figure 3-2: Napa County Hazard Risk Matrix

Secondary & Compounding Hazard Events

The MJHMP primarily examines the vulnerabilities of hazard events individually within the planning area. However, it is recognized that hazards often occur in combination, leading to compounded effects. Frequently, a secondary hazard is triggered by or occurs following the first event, such as a severe rain event following a wildfire that causes debris flows in the burn scar. Other events are compounded by outside factors, like wildfire evacuations occurring during Public Safety Power Shutoff (PSPS) events. This plan discusses these multi-hazard risks within the hazard profiles of Section 3.3 by highlighting potential secondary and compounding hazards that could result from initial events or intensify impacts.

The plan also considers the implications of pairing hazard events with the need for emergency evacuation or response, particularly in light of experiences during the COVID-19 pandemic. This includes local governments actively considering response and mitigation strategies that address the impacts of multiple hazard events, such as a pandemic occurring alongside other hazards like floods, severe weather, or wildfires.

By understanding the interplay among different hazards and preparing for compounded events, the MJHMP aims to enhance the resilience and preparedness of the planning area against a wide range of potential disaster scenarios.

3.2.1 Climate Change Impacts

Climate change is a global phenomenon that can impact many aspects of society including public health, natural and managed resources, critical facilities, buildings, infrastructure, and services. Projected changes to the climate are dependent on location. In California, the University of California Berkeley Geospatial Innovation Facility developed a platform called Cal-Adapt funded by the California Energy Commission (CEC). This platform provides tools and data on climate change across the state, including for Napa County, from global scale models that have been localized (downscaled) to 3.7-mile by 3.7-mile grids.

Napa County is experiencing climate change in various forms, including increasing frequency and severity of severe weather and wildfires, which offer a tangible glimpse of future conditions. Existing conditions combined with predictive modeling indicate that the impacts of climate change will continue to be significant and will increase over time impacting all aspects of the local environment, built and natural. Recent events, including the COVID-19 pandemic, reveal another clear truth: the impacts of climate change will disproportionately be experienced by the most vulnerable and marginalized populations.

Table 3-3 summarizes the potential impacts of climate change on various hazards, noting that all impacts will disproportionately affect vulnerable populations.

Cal-Adapt data combined with information from the California Fourth Climate Change Assessment was used to model future changes in specific types of hazards. Projections are outlined by two separate Representative Concentration Pathways (RCP):

- **RCP 4.5** is a medium emissions scenario where global emissions peak by the year 2040 and then decline.
- **RCP 8.5** is a high emissions scenario in which global emissions continue to rise through the end of the twenty-first century.

Table 3-3: Climate Change Impacts on Hazards

Hazard	Summary of Impacts
Extreme Heat	By 2100, annual number of extreme heat days above 98.6°F increase from 4 to 22 and number of warm nights above 59.5°F increase from 5 to 39 (RCP 4.5). Increases in average maximum temperature also contribute to worsening air quality.
Wildfire	Approximately 20% increased probability of wildfire in a 10-year period. Increases in wildfires also contribute to worsening air quality.
Slope Failure	Increased susceptibility of landslides as precipitation variability increases and wildfires increase in frequency, area, and severity.
Flood	Low-lying areas experiencing more frequent and intense flooding, with the area of flooding potentially expanding. Precipitation will arrive in more intense storms, increasing runoff and flash flooding. Additionally, increased moisture transport and delivery from atmospheric river storms.
Sea-Level Rise	Up to 6.0 feet of sea level rise by 2100, inundating areas along the San Pablo Bay and Napa River through.
Drought	More frequent and severe periods of drought, challenging drinking water supplies and aquatic species habitat. Precipitation will arrive in more intense storms, increasing runoff and reducing the amount of water recharging local aquifers, further exacerbating the impacts of drought on water supply. Increases in longer periods of drought also contribute to worsening air quality.

3.2.2 Disproportionately Impacted Populations

Certain populations face heightened risks following disasters due to factors such as age, economic status, mobility limitations, physical or mental disabilities, and geographic location. Vulnerability is not static; individuals may be more at risk from some hazards than others. For instance, a low-income family without transportation may struggle during rapid evacuations for wildfires or floods but could be adequately prepared for an earthquake event. Mitigation efforts can reduce personal vulnerability for some but not all individuals, especially those reliant on caregiving networks like children, the elderly, and persons with disabilities. Further, environmental risk often disproportionately burdens lower-income and marginalized communities, who typically reside in hazard-prone areas with fewer mitigation resources. (National Center for Disaster Preparedness, 2020)

In considering which hazards to prioritize and profile in this risk assessment, the county-wide HMPT reviewed local demographics and identified communities that have been disproportionately affected by hazard events in the past and those that could be impacted by such disasters in the future. In the vulnerability assessments for profiled hazards, these disproportionately impacted populations are more specifically identified and discussed in the context of the demographics of the respective jurisdiction. For

the county-wide hazards profiled in this Volume 1, Napa County's Community Profile in Section 1.5 is the basis for the population vulnerability discussions summarized herein.

3.2.3 County-Wide Priority Hazards

The results of the initial risk ranking exercise completed by the county-wide HMPT and then refined by the County Planning Team are identified in the county's completed matrix in Figure 3-2. Table 3-4 provides the final list of priority hazards and subhazards with additional details about why the county-wide priority hazards were chosen and why other hazards were not prioritized. However, it should be noted that many hazards not prioritized for profiling are briefly discussed as secondary or compounding hazards, and subhazards that were profiled and included in the risk assessment are listed specifically. This prioritization exercise was also completed by all other jurisdictional planning teams, the results of which are described in the jurisdictional annexes of Volume 2 and provided in the Planning Process Library (Section 2.1.3).

Table 3-4: County-Wide Hazards Prioritization Summary

Hazard	Priority	Explanation
Earthquake / Liquefaction	**Extreme**	Profiled in Section 3.3.4, including Liquefaction
Wildfire	**Extreme**	Profiled in Section 3.3.1
Flood	**High**	Profiled in Section 3.3.2, including Levee Failure
Levee Failure	**High**	Profiled in Section 3.3.2 under Flood
Extreme Weather / Storms	**High**	Profiled in Section 3.3.5 as Severe Weather, including High Wind, Heavy Rain, and Winter Weather
Drought	**High**	Profiled in Section 3.3.6
Geologic / Mass Movement	**High**	Profiled in Section 3.3.5 as Slope Failure
Extreme Heat	**High**	Profiled in Section 3.3.8
Agricultural Pests	**High**	Profiled in Section 3.3.9 under Climate Change as part of Agricultural Impacts
Sea Level Rise	**High**	Profiled in Section 3.3.9 under Climate Change
Climate Change	**High**	Profiled in Section 3.3.9, including Sea Level Rise and Agricultural Impacts, and discussed as a compounding hazard in relevant profiles
Dam Failure	**Medium**	Profiled in Section 3.3.3
Avalanche	-	Not a priority due to low probability
Coastal	-	Not a priority due to low probability and impact potential
Extreme Cold	-	Not a priority due to low probability
Human-Caused	-	Not a priority due to being addressed in other plans
Insects	-	Not a priority due to being addressed in other plans
Pandemic Disease	-	Not a priority due to being addressed in other plans
Soil	-	Not a priority due to low probability and impact potential
Subsidence	-	Not a priority due to low probability and impact potential
Tornado	-	Not a priority due to low probability
Tsunami / Seiche Wave	-	Not a priority due to low probability and impact potential
Volcano	-	Not a priority due to no exposure

3.3 Vulnerability to Specific Hazards

This section provides profiles of the various priority hazards affecting Napa County, including an overview of characteristics, historical information, and the existing regulatory environment pertaining to the hazard. In addition to county-wide considerations for each, the profiles in this Volume 1 document also analyze vulnerabilities specific to unincorporated county areas and how the priority hazards may affect populations, property, and critical facilities and infrastructure within Napa County's jurisdiction.

Most importantly, Napa County's county-wide hazard mitigation strategy presented in Section 4 responds to the particular vulnerabilities outlined in this section. The mitigation strategy provides prescriptions or actions to achieve the greatest reduction of vulnerability based on this section, which results in saved lives, reduced injuries, reduced property damage, and protection for the environment in the event of a natural hazard. Methods for calculating exposure and loss estimates are described in Section 2.2 and Appendix A.

The hazard profiles in this section provide quantifiable exposures to people, property, and county assets where possible and describe other vulnerabilities particular to Napa County; similar analyses for the other participating jurisdictions are presented in the Volume 2 annexes for their priority hazards.

Wildfire
SECTION 3.3.1



Flood
SECTION 3.3.2



Dam Failure
SECTION 3.3.3



Earthquake
SECTION 3.3.4



Slope Failure
SECTION 3.3.5



Drought
SECTION 3.3.6



Severe Weather
SECTION 3.3.7



Extreme Heat
SECTION 3.3.8



Climate Change
SECTION 3.3.9





Wildfire

3.3.1 Wildfire Hazard Profile



A wildfire is any uncontrolled fire occurring on undeveloped land that requires fire suppression. Wildfires can be ignited by lightning or by human activity such as smoking, campfires, equipment use, and arson. The 2023 California State Hazard Mitigation Plan defines wildfires as:

> *Any free-burning vegetative fire that initiates from an unplanned ignition, whether natural (e.g., lightning) or human-caused (e.g., powerlines, mechanical equipment, escaped prescribed fires), where the management objective is full suppression.*

Wildfire is one of the most significant hazards affecting Napa County due to the county's combination of rugged topography, extensive vegetation, recurring drought conditions, and widespread development in the wildland-urban interface (WUI). Napa County's fire environment includes forested uplands, shrublands, grasslands, and agricultural landscapes, all of which can contribute to wildfire ignition and spread under the right weather and fuel conditions. The county's wildfire risk is heightened by steep slopes, narrow canyons, limited access in rural areas, and the presence of dispersed residential development in high and very high fire hazard severity zones.

Napa County is characterized by a complex and highly fire-prone landscape defined by a central valley bounded by the Mayacamas and Vaca Mountains, with extensive watersheds, canyons, and diverse microclimates that influence wildfire behavior. Vegetation across the county ranges from grasslands and shrublands to oak woodlands and coniferous forests, creating a continuous and varied fuel profile. These natural conditions, combined with dispersed rural development and significant WUI areas, contribute to elevated wildfire risk throughout much of the county. Steep terrain and limited access in mountainous areas further complicate suppression efforts and increase the likelihood of rapid fire spread under extreme weather conditions.

Wildfire is a persistent and recurring hazard in Napa County, with a long history of large, damaging fires across the landscape. Recent events, including the LNU Lightning Complex and Glass Fire in 2020, burned hundreds of thousands of acres and destroyed thousands of structures, demonstrating the scale and intensity of wildfire potential in the region. Fire behavior modeling indicates that under severe weather conditions, a significant portion of the county is capable of supporting high-intensity fire, including flame lengths exceeding 20 feet and the potential for torching and crown fire, which generate embers capable of igniting spot fires well ahead of the main fire front (Napa Firewise, 2021). This dynamic significantly increases the risk of structure-to-structure ignition within developed areas.

The County's wildfire risk is further compounded by increasing development in fire-prone areas, climate-driven changes in fuel conditions, and the growing frequency of extreme weather events. Napa County's Emergency Operations Plan recognizes wildfire as a major hazard requiring coordinated, multi-jurisdictional response and long-term preparedness, particularly given the potential for large-scale

incidents to overwhelm local resources and require mutual aid . As wildfire seasons lengthen and fuels become more receptive to ignition, the potential for large, fast-moving fires and urban conflagration is expected to increase, underscoring the need for sustained mitigation efforts, including fuel management, defensible space, and coordinated emergency response planning.

3.3.1.1 Secondary & Compounding Hazards

Wildfires can produce a wide range of secondary and compounding hazards that extend beyond the immediate fire perimeter. These hazards can increase damage to infrastructure, worsen environmental impacts, and prolong recovery time. The secondary and compounding hazards are briefly discussed in this section in relation to wildfire, and some are discussed in other profiles. In Napa County, these include slope destabilization from post-fire flooding in the Slope Failure Hazard Profile (Section 3.3.5), high wind in the Severe Weather Profile (Section 3.3.7), drought (Section 3.3.6), and climate change (Section 3.3.9).

Slope Destabilization & Sedimentation

Wildfires remove vegetation that stabilizes soil, increasing the likelihood of erosion, slope failure, debris flows, and sedimentation during subsequent rain events. In Napa County, steep terrain in the Mayacamas Mountains, Vaca Range, and other upland areas make post-fire landscapes especially vulnerable to landslides and flooding. Loss of vegetation can allow rainfall to mobilize ash, soil, and rock, which may damage roads, bridges, culverts, reservoirs, and water supply infrastructure. Sediment runoff can also affect streams and the Napa River, reducing water quality and increasing flood risk downstream.

High Wind

High wind events are a major factor in wildfire ignition and spread in Napa County. Strong winds, low humidity, and high temperatures can create conditions favorable for rapid fire growth, long-range ember transport, and extreme fire behavior. Wind-driven fires can spread quickly across ridges and valleys, threatening communities and overwhelming suppression efforts. High winds also increase the risk of powerline damage and equipment failure, which can lead to ignition during dry conditions.

The Napa Valley has a characteristic southerly wind that originates from the San Francisco Bay and, during the dry season, strong winds come from the north occasionally. Both are significant factors in the spread of wildland fires. In addition, local topographic wind effects within canyons and along ridgelines intensify fire behavior and contribute to the long-distance transport of embers.

Climate Change & Drought

Fire in western ecosystems is determined by climate variability, local topography, and human intervention. Climate change has the potential to affect multiple elements of the wildfire system: fire behavior, ignitions, fire management, and vegetation fuels. Hot, dry spells create the highest fire risk. Drought and increased temperatures intensify wildfire danger by drying out and stressing vegetation. Climate change also may increase winds that spread fires. Faster fires are harder to contain and, thus, are more likely to expand into

residential neighborhoods. Prolonged drought conditions can also reduce water availability for firefighting and increase the vulnerability of forests and grasslands to insect damage, disease, and tree mortality, all of which add to fuel loads.

Napa County is already considered to be an area that is at high-risk for wildfires. Climate change is projected to increase this current risk by anywhere from 10% to 20%, and the county will need to continue to adapt to this projected increase and the additional threats it brings to emergency services, roads, water supplies, housing access, and quality of life.

As climate conditions shift toward longer fire seasons and drier fuels, secondary wildfire effects are expected to increase in both frequency and severity across Napa County. A changing climate is expected to subject forests to increased stress due to drought, disease, invasive species, and insect pests, such as the shothole borer. These stressors are likely to make forests more vulnerable to catastrophic fire due to increased standing dead biomass. While periodic fires are natural processes and fulfill an important ecological function, catastrophic fire events that cannot be contained or managed can cause serious threats to homes and infrastructure, especially for properties located in or adjacent to the WUI. Moreover, rain events are predicted to become more severe in our changing climate, and post-fire flooding and slope stabilization could worsen as well.

Smoke

Wildfire smoke can affect large portions of Napa County, including areas far from the active fire. Smoke contains fine particulate matter (PM2.5), and other pollutants that can cause respiratory and cardiovascular problems, particularly for sensitive populations such as children, older adults, outdoor workers, and individuals with existing health conditions. Agricultural workers may be especially vulnerable because they often work outdoors during harvest and other peak seasons that coincide with wildfire season. Smoke can also disrupt transportation, tourism, schools, and outdoor activities, creating economic and social impacts beyond the burn area.

Urban Conflagration

In areas where homes and businesses are closely spaced, wildfire can transition into an urban conflagration, where structures ignite one another through radiant heat, ember intrusion, or direct flame contact. This risk is highest in the wildland-urban interface and in developed areas located within High and Very High Fire Hazard Severity Zones. Once multiple structures ignite, firefighting resources may be overwhelmed, and fire spread may continue even after the wildland fire front has passed. Building materials, landscaping, and inadequate defensible space can increase the likelihood of structure-to-structure fire spread.

According to FEMA and the National Fire Protection Association (NFPA), an urban conflagration occurs when a structural fire spreads from building to building in a continuous, uncontrollable manner, often involving multiple city blocks. This type of hazard is exacerbated by high winds, limited firefighting access, compromised water supply, and inadequate building separation or fire-resistance standards.

The 2020 LNU Lightning Complex Fire demonstrated the destructive potential of wildfires transitioning into residential zones. High winds, dry fuels, and closely spaced structures enabled rapid fire spread, resulting in the loss of homes and the displacement of tens of thousands of residents. Key factors contributing to urban conflagration include:

- Flying embers (firebrands) igniting structures and vegetative fuels far ahead of the main fire front
- Limited defensible space around structures
- Combustible building materials
- Narrow, steep, or dead-end access roads that hinder evacuation and response

The risk of urban conflagration is highest in areas with dense housing, limited infrastructure resilience, and poor access for fire suppression, such as in the areas of Atlas Peak, Calistoga, Howell Mountain, and Pope Valley. As wildfire behavior intensifies due to climate and fuel conditions, the potential for fires to escalate into community-scale conflagrations will remain a critical concern for hazard mitigation and land use planning in Napa County.

Power Outages & Public Safety Power Shutoffs (PSPS)

Wildfires and extreme fire weather conditions can lead to widespread power outages, either from damage to electrical infrastructure or from Public Safety Power Shutoff (PSPS) events implemented to reduce ignition risk. Power outages can disrupt communications, water supply systems, fuel distribution, medical equipment, and emergency response operations. Rural and mountainous areas may be particularly vulnerable due to long transmission lines and limited backup power.

Evacuation, Transportation & Access Constraints

Wildfire events can create significant evacuation challenges in Napa County due to limited road networks, steep terrain, and dispersed rural development. Road closures caused by fire, smoke, or falling debris may isolate communities and delay emergency response. Heavy traffic during evacuations can reduce the ability of residents to leave threatened areas and may hinder access for firefighting equipment.

3.3.1.2 Policies, Plans & Regulatory Environment

Wildfire risk management in Napa County is governed by a combination of federal, state, and local policies, plans, and regulatory programs that define fire protection responsibilities, establish development standards in fire-prone areas, and guide mitigation and preparedness activities. These authorities include the designation of State Responsibility Areas (SRA), Local Responsibility Areas (LRA), and Federal Responsibility Areas (FRA), as well as requirements contained in the Napa County General Plan, Safety Element, Community Wildfire Protection Plan (CWPP), Hazard Mitigation Plan, and California fire safety regulations. Together, these frameworks establish the regulatory environment for wildfire hazard reduction and emergency response in Napa County.

Wildfire Protection Responsibility

Local, state, tribal, and federal organizations all have legal and financial responsibility for wildfire protection. In many instances, two fire organizations have dual primary responsibility on the same parcel of land—one for wildfire protection and the other for structural fire protection. To address wildfire jurisdictional responsibilities, in 1981 the California State Legislature outlined various wildfire responsibilities, described below, in Public Resources Code § 4291.5 and Health and Safety Code § 13108.5:

- **Federal Responsibility Areas (FRAs):** FRAs are fire-prone wildland areas that are owned or managed by a federal agency such as the U.S. Forest Service, National Park Service, Bureau of Land Management, U.S. Fish and Wildlife Service, or U.S. Department of Defense. Primary financial and rule-making jurisdictional authority rests with the federal land agency. In many instances, FRAs are interspersed with private land ownership or leases. Fire protection for developed private property is usually not the responsibility of the federal land management agency but of the relevant local government agency. Federal lands in and near Napa County include national forest and recreation lands in the surrounding mountain ranges and watershed areas.
- **State Responsibility Areas (SRAs):** SRAs are lands in California where the California Department of Forestry and Fire Protection (CAL FIRE) has legal and financial responsibility for wildfire protection and where CAL FIRE administers fire hazard classifications and building standard regulations. SRA boundaries are those adopted by the California Board of Forestry and are reviewed and updated every five years. Where SRAs contain structures or development, the responsibility for fire protection of those improvements falls to the relevant local government agencies. Las Posadas Demonstration State Forest (LPDSF) is a 796-acre mixed conifer forest located in Napa County, which also incorporates the most eastern stand of redwood trees in California. (Strategic Fire Plan Sonoma-Lake-Napa Unit, 2017) SRAs are defined as lands that:
    - Are unincorporated county areas;
    - Not federally owned;
    - Have wildland vegetation cover rather than agricultural or ornamental plants; or
    - Have watershed, range, or forage values.
- **Local Responsibility Areas (LRAs):** LRAs include land in cities, cultivated agriculture lands, unincorporated non-flammable areas, and lands that do not meet the criteria for SRA or FRA. LRA fire protection is typically provided by city or county fire departments, fire protection districts, or by CAL FIRE under contract to local governments. LRAs may still include areas of flammable vegetation and WUI. In Napa County, LRAs include the cities of Napa, American Canyon, Calistoga, St. Helena, Yountville, and developed portions of the unincorporated valley floor served by local fire protection districts. Local agencies in LRAs enforce building and fire codes, maintain fire departments, and coordinate with CAL FIRE and other agencies during major wildfire events. Although LRAs may have lower wildfire hazard overall, many LRA areas are still located within or adjacent to the wildland-urban interface and remain vulnerable to wildfire impacts.

Wildfire Protection Responsibilities in Napa County

California has adopted a number of statewide regulations intended to reduce wildfire risk, particularly in Fire Hazard Severity Zones and SRA's. These regulations include building standards, defensible space requirements, and fire-safe development rules that apply to new construction and in some cases to existing structures.

State fire safety requirements include the California Fire Code, California Building Code Chapter 7A (materials and construction methods for exterior wildfire exposure), and Public Resources Code requirements for defensible space around structures in fire-prone areas. CAL FIRE also adopts Fire Hazard Severity Zone maps that must be used by local governments when planning development and enforcing fire safety regulations. These requirements are intended to reduce structure ignitability, improve firefighter access, and limit the spread of wildfire into developed areas.

The California State Hazard Mitigation Plan also identifies wildfire as one of the state's most significant hazards and encourages local jurisdictions to integrate wildfire mitigation into land use planning, infrastructure design, vegetation management, and emergency preparedness programs.

Fire Protection Agencies in Napa County	
Primary Agencies	**Volunteer / Supporting Agencies**
▪ CAL FIRE Sonoma-Lake-Napa Unit (LNU) ▪ Napa County Fire Department ▪ City of Napa Fire Department ▪ American Canyon Fire Protection District ▪ St. Helena Fire Department ▪ Calistoga Fire Department ▪ Yountville Fire / Napa County Fire (contract service)	▪ Rutherford Volunteer Fire ▪ Pope Valley Volunteer Fire ▪ Gordon Valley Station ▪ Soda Canyon Station ▪ Spanish Flat / Lake Berryessa Stations ▪ Dry Creek–Lokoya Volunteer Fire ▪ Angwin / Deer Park Volunteer Fire ▪ Knights Valley Volunteer Fire ▪ Mountain Volunteer Fire Company ▪ Napa County Volunteer Fire Companies (various stations)

Fire protection in Napa County is provided through a cooperative system involving municipal fire departments, special districts, volunteer fire companies, Napa County Fire, CAL FIRE, and federal agencies. Responsibility for wildfire suppression varies depending on whether the incident occurs within FRA's, SRA's, or LRA's. All agencies participate in the California mutual aid system and coordinate through the Napa County Emergency Operations Plan during large incidents.

Federal Regulatory Environment

Healthy Forests Restoration Act

In 2003, the federal Healthy Forests Restoration Act (HFRA) appropriated specific funding to address five main sub-categories through the National Fire Plan (NFP): preparedness, suppression, reduction of hazardous fuels, burned-area rehabilitation, and state and local assistance to firefighters. Appropriations under this Act continue through the present. The spirit of the HFRA and NFP is reflected in the many CWPP developed in Napa County. The CWPP meets the requirements of HFRA by:

1. Identifying and prioritizing fuels reduction opportunities across the landscape;
2. Addressing structural ignitability;
3. Assessing community fire suppression capabilities; and
4. Collaborating with stakeholders.

State Regulatory Environment

Wildfire hazard mitigation in Napa County is strongly influenced by statewide regulations that apply to development, vegetation management, and fire protection in wildfire-prone areas. Because large portions of Napa County are located within SRA and High or Very High Fire Hazard Severity Zones, state fire safety laws play a significant role in land use planning, building design, and emergency access requirements. These regulations are enforced by CAL FIRE, Napa County, and local fire agencies depending on jurisdiction.

Fire Hazard Severity Zones (FHSZ)

Fire Hazard Severity Zones (FHSZ) are geographic areas identified by the California Department of Forestry and Fire Protection (CAL FIRE) that reflect the potential for wildfire based on fuel loading, slope, fire weather, and other environmental conditions. These zones are classified as Moderate, High, or Very High Fire Hazard Severity Zones and are used by local governments to guide land use planning, building standards, defensible space requirements, and wildfire mitigation activities. The designation of FHSZ is required under California Government Code and is incorporated into local planning documents, including the Safety Element and hazard mitigation planning efforts.

To characterize wildfire risk at a landscape-scale, CAL FIRE has developed and maintains FHSZ. These zones are established using a statewide fire behavior modeling system that incorporates the following variables:

- Vegetation type and fuel load
- Topography (slope and aspect)
- Historical fire frequency and ignition density
- Weather conditions, including the number of days per year with extreme fire behavior potential
- Spot fire potential and ember cast range

According to the most recent FHSZ data, large areas of unincorporated Napa County fall within "High" or "Very High" severity zones, as identified on Figure 3-5, particularly in and around Atlas Peak, Calistoga, Howell Mountain, and Pope Valley. These zones correspond closely with regions impacted by recent major wildfires, such as the 2020 LNU Lightning Complex and 2017 Tubbs Fire.

Development within High and Very High Fire Hazard Severity Zones presents additional challenges for emergency response, evacuation, and infrastructure protection. Many communities in these zones are served by limited road networks, narrow access routes, and overhead utilities, which can be damaged during wildfire events and restrict evacuation or firefighting access.

Fire Hazard Severity Zone mapping is also used to prioritize wildfire mitigation activities identified in the CWPP, including fuel reduction, shaded fuel breaks, evacuation route improvements, and community preparedness projects.

California Public Resources Code § 4290

California Public Resources Code § 4290 establishes minimum wildfire protection standards for the design and construction of structures, subdivisions, and developments in SRA. These regulations require that new development provide adequate emergency access, road width and grade standards, turnaround areas, signage and address identification, water supply for fire protection, and vegetation modification. The purpose of these requirements is to ensure that emergency responders can safely access structures during wildfire events and that development in fire-prone areas does not increase risk to life or property. Because much of Napa County's unincorporated area lies within the SRA, these standards are applied to many rural and hillside developments.

California Public Resources Code § 4291

California Public Resources Code § 4291 requires property owners in fire-prone areas to maintain defensible space around structures, generally consisting of a minimum 100-foot buffer free of hazardous vegetation. This requirement applies to structures located in mountainous areas, forested lands, grasslands, or other locations containing flammable vegetation. If a full 100-foot clearance cannot be achieved, vegetation must be reduced to the property line to the extent possible. Defensible space requirements are intended to reduce structure ignitability, improve firefighter safety, and slow the spread of wildfire. In Napa County, defensible space regulations are enforced in both SRA's and many LRA's where wildfire hazard is present.

California Building Standards Code

The California Building Standards Code (Title 24 of the California Code of Regulations) incorporates the California Fire Code and establishes construction standards intended to reduce wildfire risk in fire-prone areas. These standards include requirements for ignition-resistant construction materials, fire-resistant roofing, ember-resistant vents, address signage, fire apparatus access, road and driveway design, water supply, and clearance around structures. Building standards are updated on a regular cycle and are enforced by local jurisdictions through the building permit process. In areas designated as Fire Hazard Severity

Zones, additional requirements may apply to ensure that new development can be safely accessed by emergency responders and is less likely to ignite during a wildfire.

Local Regulatory Environment

CAL FIRE Sonoma-Lake-Napa Unit Strategic Fire Plan

The CAL FIRE Sonoma-Lake-Napa Unit (LNU) serves the counties of Sonoma, Lake, Napa, Solano, Yolo, and Colusa. The LNU Strategic Fire Plan is a product of the implementation of the 2018 State Fire Plan. The State Fire Plan provides an analysis procedure to assess fire fuel hazards and risks in order to design and implement mitigating activities. The LNU plan provides background information, fuels and fire data, proposed projects, and individual Battalion reports outlining mitigating activities commonly carried out each year. The plan is a local road map for the fire service and the public to create and maintain defensible landscapes to protect those assets vital to the state and its citizens.

The LNU Strategic Fire Plan outlines a comprehensive program designed to reduce total government costs and citizen losses from wildland fire in the unit. It also strives to assist the public with assistance and education to create fire adapted communities that can more safely withstand a wildland fire. To accomplish this, CAL FIRE continues to implement this plan to address such factors as:

- **Firefighter and Public Safety:** Prioritizing safety through improved access, defensible space compliance, and community evacuation planning.
- **Hazardous Fuel Reduction:** Targeted treatment of high-risk vegetative fuels, including shaded fuel breaks, prescribed burning, and mechanical thinning.
- **Fire Suppression Preparedness:** Enhancing capabilities for rapid and effective response, supported by pre-attack plans, infrastructure improvements, and real-time fire intelligence systems such as drones.
- **Public Information and Education:** Expanding outreach through programs such as Firewise USA® and Community Emergency Response Teams (CERT), with a focus on homeowner responsibility and structural hardening.
- **Interagency Collaboration:** Strengthening coordination among local fire districts, county emergency services, non-profits, and land management agencies to align priorities and pool resources for mitigation and response.

Napa County Community Wildfire Protection Plan

Napa County maintains a CWPP that provides a countywide framework for reducing wildfire risk through coordinated planning, fuel management, emergency preparedness, and public education. The CWPP was developed collaboratively with Napa County, CAL FIRE, local fire agencies, Fire Safe Councils, community organizations, and state and federal partners. The plan identifies wildfire hazards, evaluates areas of greatest risk, and prioritizes mitigation projects intended to reduce the likelihood of catastrophic wildfire and improve community resilience. The CWPP serves as a roadmap for wildfire mitigation and

preparedness at both the countywide and neighborhood level and is intended to align with federal, state, and local fire planning efforts.

The CWPP identifies several key categories of wildfire mitigation activities, including hazardous fuel reduction, community preparedness, protection of critical infrastructure, evacuation planning, and improvements to firefighting capability. Priority projects identified in the plan include vegetation management and shaded fuel breaks, roadside clearance, improvement of evacuation corridors, development of community fire protection plans, and programs to increase defensible space and structure hardening. These projects are often focused in areas located within High and Very High Fire Hazard Severity Zones and in the wildland-urban interface where the potential for structure loss is greatest.

The CWPP also supports coordination between local agencies and community organizations such as Fire Safe Councils and homeowner groups, recognizing that wildfire mitigation requires participation from both public agencies and private property owners. The plan encourages ongoing maintenance of defensible space, public outreach, and implementation of fuel reduction projects on both public and private lands. Because wildfire risk extends across jurisdictional boundaries, the CWPP provides an important mechanism for coordinating mitigation activities among Napa County, municipalities, special districts, CAL FIRE, and federal land management agencies.

Napa County Emergency Operations Plan

Napa County maintains an Emergency Operations Plan (EOP) that establishes procedures for emergency response, coordination, and recovery during disasters, including wildfires. The EOP describes how Napa County and participating jurisdictions organize emergency operations using the National Incident Management System (NIMS), the Incident Command System (ICS), and California's Standardized Emergency Management System (SEMS). These systems provide a structured framework for coordinating multiple agencies during large incidents that exceed the capability of a single department.

The EOP identifies the roles and responsibilities of County departments, local fire agencies, law enforcement, public works, public health, utilities, and partner organizations during emergencies. During wildfire incidents, the County may activate the Emergency Operations Center (EOC) to coordinate response activities, support evacuation operations, manage resource requests, and provide public information. The EOP also describes procedures for emergency notifications, evacuation warnings and orders, mutual aid coordination, and damage assessment following an incident.

Wildfire response in Napa County often involves multiple jurisdictions and agencies, particularly when fires occur in SRA's, FRA's, or near incorporated cities. The EOP establishes how local, state, and federal agencies coordinate through the operational area system to ensure that personnel, equipment, and support resources can be shared as needed. This coordination is critical during large wildfires, which may require regional or statewide mutual aid.

The EOP also addresses recovery and mitigation activities following a disaster, including damage assessment, debris removal, restoration of infrastructure, and implementation of hazard mitigation

measures to reduce future risk. Because wildfire can cause long-term impacts such as erosion, flooding, and infrastructure damage, the EOP supports integration between emergency response and hazard mitigation planning. Continued maintenance and periodic updates of the EOP help ensure that Napa County remains prepared to respond to large wildfire events and other natural hazards.

Napa County General Plan

The Napa County General Plan includes comprehensive goals, policies, and implementation measures aimed at minimizing wildfire risks and protecting residents, property, and natural resources from fire hazards. These provisions reflect a longstanding commitment to fire-adapted community planning and resilience in the WUI, but integration of wildfire risk considerations into the element is also a state requirement, particularly in SRAs and Very High FHSZs.

Under Senate Bill (SB) 1241 from 2012 and Government Code § 65302(g)(3), the county must include policies and implementation measures that address wildfire hazards in these high-risk areas. Guidance to support these updates is provided by the Governor's Office of Land Use and Climate Innovation (LCI), which issues wildfire planning recommendations and California Environmental Quality Act (CEQA) checklist updates for local adoption. These requirements are further reinforced by AB 2140 and SB 379, which encourage integration of the local hazard mitigation plan and climate adaptation planning into the safety element. Together, these statutory requirements shape Napa County's wildfire policies within the General Plan, ensuring alignment with statewide mitigation, land use, and climate resilience goals.

The Napa County General Plan includes the following policies and goals pertaining to wildfire mitigation:

- **Goal SAF-3 (Safety):** It is the goal of Napa County to effectively manage forests and watersheds, and to protect homes and businesses from fire and wildfire and minimize potential losses of life and property.
    - **Policy SAF-14:** The County will prepare a fire management plan and will continue, enhance, and implement programs seeking to reduce losses and costs associated with catastrophic fires.
    - **Policy SAF-15:** The County shall coordinate with CAL FIRE and fire agencies in neighboring counties to plan for future fire prevention and suppression needs.
    - **Policy SAF-16:** Consistent with building and fire codes, development in high wildland fire hazard areas shall be designed to minimize hazards to life and property.
        - **Action Item SAF-16.1:** Develop site criteria and construction standards for development in high fire hazard areas and adopt standards to restrict urbanizing these areas as defined in Policy AG/LU-27 unless adequate fire services are provided.
        - **Action Item SAF-16.2:** Continue to implement "Napa Firewise" through information and education programs, community outreach, and fuel modification.
    - **Policy SAF-17:** The County supports the use of prescribed fuel management programs, including prescribed burns and brush clearing, for managing fire hazardous areas; to reduce

wildfire hazard, improve watershed capabilities, promote wildlife habitat diversification, and improve grazing.

- **Policy ROS-10 (Trails):** As appropriate, combine trails with fire breaks and design trails to facilitate access for control of wildfires. Utilize temporary and seasonal trail closures, and type and intensity of use restrictions as appropriate during periods of high wildfire risk and to protect sensitive species and habitats and avoid conflict with agricultural operations.

Building & Development Codes

Napa County and municipalities have adopted the California Building Standards Code, including Chapter 7A of the California Building Code (CBC) and Section R337 of the California Residential Code (CRC). As codified in Chapter 15.13 of the county's code, local amendments to the state codes strengthen wildfire resilience in new construction and exterior remodels. These amendments are designed to protect life and property in the county's extensive SRAs and WUI zones.

Title 7A of the California Building Code establishes minimum construction standards for buildings located in designated FHSZs and WUI areas. It aims to reduce wildfire ignition risk by requiring fire-resistant materials and designs for key exterior components, such as Class A roofing, ember-resistant vents, noncombustible siding, tempered windows, enclosed eaves, and ignition-resistant decking. These requirements apply to all new construction and substantial remodels after July 1, 2008, helping prevent structure-to-structure fire spread and improving building survivability during wildfire events.

The county's refinements to building and fire codes include the following:

- **Residential Fire Protection and Hazard Abatement:** Napa County regulations require property owners to maintain a defensible space in accordance with the Defensible Space Guidelines. Failure to maintain defensible space, including the accumulation or storage of materials within established boundaries, is considered a nuisance and subject to County enforcement. (§8.36.60)
- **Road and Street Standards:** The Napa County Road and Street Standards are developed to be consistent with the State Responsibility Area (SRA) Fire Safe Regulations. (Cal. Code Regs. tit. 14, § 1270 et. seq.) The County is only one of four Counties to have road standards that meet these stringent requirements. (Napa County Climate Action Plan, 2018, p. 4.10)
- **Telecommunications Facilities:** Requires all radio, television and voice communication facilities providing service to government or the general public be designed to survive a natural disaster without interruption in operation, including structural modifications to reduce flammability. Telecommunication facilities also shall be designed and operated in such a manner so as to minimize the risk of igniting a wildfire or intensifying one that otherwise occurs, including many related structural and operational requirements. (§18.119.080, §18.119.150)

3.3.1.3 Past Events, Location & Extent

Napa County has experienced numerous wildfires over the past several decades Figure 3-3, including several large and destructive events that have caused damage to homes, infrastructure, and natural

resources. These events demonstrate the county's vulnerability to fast-moving, wind-driven fires and highlight the importance of continued mitigation and preparedness efforts.

There are four major factors that influence where and when wildfire events occur in Napa County:

- Extreme vegetation diversity
- Diverse fire weather and fire behavior
- Dynamic fire history
- Complex land use patterns

Notable Wildfire Events

One of the most significant wildfire events affecting Napa County in recent years was the 2017 wildfire siege, which included multiple fires across Napa, Sonoma, and surrounding counties. These fires resulted in widespread evacuations, destruction of homes, and major impacts to transportation, utilities, and the regional economy. The event demonstrated the potential for wildfire to spread rapidly across jurisdictional boundaries and overwhelm local response resources, requiring regional and statewide mutual aid.

In 2020, the LNU Lightning Complex fires burned extensively across Napa County and neighboring counties following a series of lightning strikes during dry and windy conditions. These fires affected large areas of wildland and rural communities and required prolonged evacuation orders. The event highlighted the role of extreme weather, drought conditions, and heavy fuel loads in producing large wildfire incidents.

Napa County has also experienced numerous smaller wildfires that have caused localized damage, road closures, and evacuations. These incidents often occur in hillside areas, along transportation corridors, or in locations where vegetation, weather, and human activity combine to create ignition risk. In addition to direct fire damage, past wildfire events in Napa County have resulted in secondary impacts such as erosion, flooding, poor air quality, and power outages.

From 2015 to 2025, there were 10 wildfire events that burned over 1,000 acres in Napa County. These events are listed in Table 3-5 and displayed in Figure 3-3. The most recent events are described in detail below.

Table 3-5: Wildfires in Napa County 1,000 Acres or Greater, 2015-2025

Year	Name	Size in Acres
2015	Jerusalem Fire	25,118
2015	Wragg Fire	8,051
2015	Valley Fire	76,067
2016	Cold Fire	5,730
2017	Tubbs Fire	36,807
2017	Nuns Fire	56,556
2017	Atlas Fire	42,349
2018	Snell Fire	2,463

2018	County Fire	89,836
2020	Glass Fire	67,484
2020	Hennessey Fire (part of LNU Lightening Complex)	305,352
2020	LNU Lightning Complex Fire	363,220
2025	Pickett Fire	6,820

Source: CAL FIRE

Butts & Wragg Fires (2014/2015)

The Butts Fire began on July 1, 2014, near Butts Canyon Road north of Pope Valley in northeastern Napa County and spread into Lake County. The fire burned approximately 4,300 acres, destroyed multiple structures, and forced evacuations in rural communities near Lake Berryessa and Pope Valley. The fire occurred during hot, dry summer conditions and spread rapidly through grass, brush, and timber fuels in steep terrain, requiring a large multi-agency response.

The Wragg Fire occurred in July 2015 in the eastern portion of Napa County near Lake Berryessa and spread into Solano and Yolo counties. The fire burned approximately 8,000 acres and forced evacuations in rural communities. Although structural damage was limited compared to larger fires, the Wragg Fire demonstrated how quickly fire can spread under hot, dry, and windy conditions in grassland and brush fuels. The fire also affected transportation corridors and required closure of major roadways, illustrating the vulnerability of evacuation routes in rural areas. (Strategic Fire Plan Sonoma-Lake-Napa Unit, 2017)

Atlas, Tubbs & Nunn Fires (2017)

The October 2017 Northern California wildfires, also known as the Northern California firestorm, North Bay Fires, and Wine Country Fires, were a series of 250 wildfires that started burning across California. The fires broke out throughout Napa, Lake, Sonoma, Mendocino, Butte, and Solano Counties during severe fire weather conditions. (Nix, 2017) The Atlas Tubbs and Nunn Fires started on October 8th, 2017 in Napa County and together damaged over 1,110 structures and destroyed over 5,756. (Cal Fire, 2018). At the time, the Tubbs Fire was the most destructive wildfire in California history, burning parts of Napa, Sonoma, and Lake counties and inflicting its greatest losses in the City of Santa Rosa. Its destructiveness was surpassed only a year later by the Camp Fire of 2018.

LNU Lightning Complex Fire (2020)

The LNU Lightning Complex Fire began in August 2020 following a widespread lightning storm that ignited numerous fires across Northern California, including the Hennesey. The complex included multiple fires burning in Napa, Sonoma, Lake, Solano, and Yolo counties and became one of the largest wildfire events in California history. The LNU Lightning Complex burned approximately 363,220 acres, destroyed hundreds of structures, and required large-scale evacuations throughout the region. Portions of the fire burned in eastern

and northern Napa County, including areas near Lake Berryessa, Pope Valley, and other rural communities located in steep, heavily vegetated terrain.

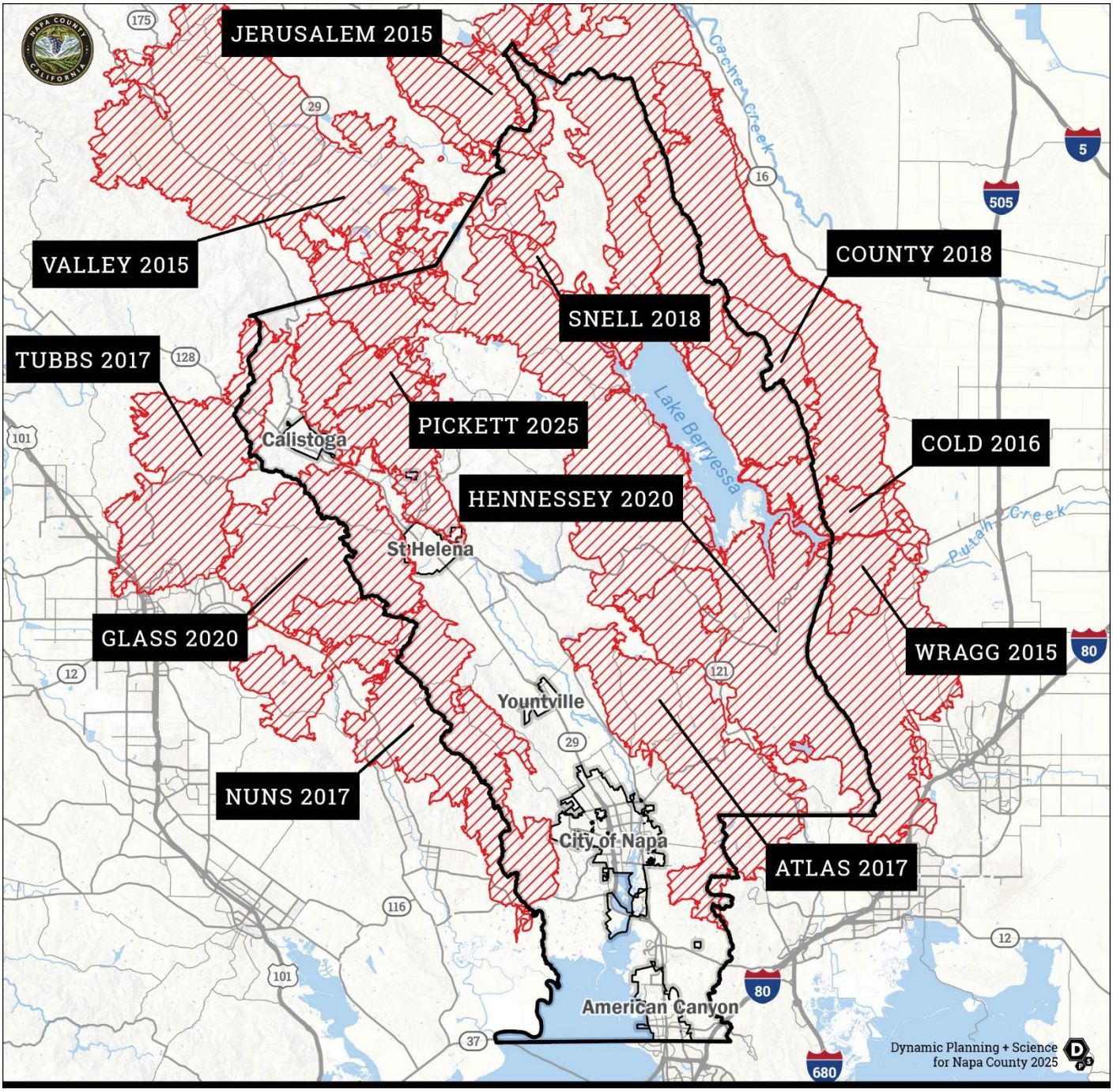
The fire occurred during a period of extreme fire weather characterized by dry fuels, high temperatures, low humidity, and limited firefighting resources due to multiple simultaneous incidents across the state. Lightning ignitions combined with drought-stressed vegetation allowed the fire to spread rapidly across wildland areas, including locations within SRA's and High and Very High Fire Hazard Severity Zones. The incident required a prolonged multi-agency response involving local fire departments, CAL FIRE, federal agencies, and mutual-aid resources from throughout California.

The LNU Lightning Complex demonstrated the potential for a single weather event to ignite multiple large fires across the region at the same time, overwhelming local response capability and requiring regional coordination. The fire also caused secondary impacts including road closures, power outages, smoke impacts across the Napa Valley, and damage to natural resources and infrastructure. The event highlighted the importance of vegetation management, evacuation planning, defensible space, and interagency coordination in reducing wildfire risk in Napa County.

The 2020 lightning fire siege, including the LNU Lightning Complex, is considered one of the most significant wildfire events affecting Napa County in recent history and illustrates the continuing risk of large, wind-driven, or lightning-caused fires under extreme weather conditions.

Pickett Fire (2025)

The Pickett Fire occurred in August 2025 in Napa County near the community of Calistoga. Fueled by strong winds, dry vegetation, and extreme heat conditions, the fire spread to over 6,800 acres within the first 24 hours and destroyed or damaged several structures, disrupted livelihoods, and placed entire communities under severe stress before being contained. The burn area was within the 2020 Glass Fire burn scar, much of which had regrown with dense fuels. At its peak, more than 3,500 structures were threatened, prompting large-scale evacuations and road closures in the Napa Valley region.



Historic Large Fires

Unincorporated County

*Data sources: CalFire. Fires over 1000 Acres since 2015.

Fire Perimeter

Figure 3-3: Historic Large Fires Map

3.3.1.4 Frequency & Probability of Future Occurrences

Generally, Napa County faces a wildland fire threat each and every year. In 2010 Ernie Loveless, Chief of the CAL FIRE Napa-Lake-Sonoma Unit at the time, stated, "We must be honest with ourselves. Wildland fires are part of our history and will certainly be part of our future. Being prepared is critical." **The probability of wildfire occurring in Napa County is highly likely (100% annual probability).**

The wildland fire risk in Napa County can be attributed to three factors: ignition sources and fuel loading. Ignition sources, or fuels, in Napa County range include grass/oak woodland, 15- to 50-year-old chaparral, redwood forests, and timber over 50 years old. Critical concerns are when the chaparral dead-to-live ratio exceeds 50%, and live fuel moisture approaches 60% in late summer and early fall. (Strategic Fire Plan Sonoma-Lake-Napa Unit, 2017)

To better quantify wildfire frequency, Napa County uses the Mean Fire Return Interval (MFRI), a metric that estimates the average number of years between fires at a given location. As shown in Figure 3-4, the spatial distribution of MFRI indicates that large portions of Napa County, particularly across the valley floor and lower elevation areas, are characterized by shorter fire return intervals, generally ranging from approximately 0 to 12 years and 12 to 35 years. These areas are dominated by grasses and other fine, flashy fuels that cure seasonally and are highly receptive to ignition, resulting in more frequent fire occurrence.

In contrast, portions of the mountainous terrain in the Mayacamas and Vaca Mountains exhibit moderate to longer fire return intervals, generally ranging from 35 to 70 years or greater. These areas tend to support denser shrublands and forested vegetation types, where fuel accumulation occurs over longer periods, leading to less frequent but potentially higher-intensity wildfire events. Despite these longer intervals, these areas are capable of producing extreme fire behavior under severe weather conditions, including crown fire and long-range ember cast.

As climate change continues to influence wildfire dynamics through increased temperatures, prolonged drought, and more variable precipitation patterns, fire regimes across Napa County may shift. Short-interval fire areas dominated by grasses may experience even more frequent ignitions, while longer-interval forested areas may be increasingly susceptible to large, high-severity fires. These trends underscore the importance of fuel management strategies tailored to vegetation type, as well as coordinated planning to address both frequent, lower-intensity fires and less frequent but more destructive wildfire events.

Development in the wildland-urban interface also contributes to the probability of wildfire impacts. Homes, vineyards, and rural communities are often located near or within areas of dense vegetation, increasing the likelihood that fires will threaten structures and require evacuation. As development continues in fire-prone areas, the potential consequences of wildfire may increase even if the number of fires does not change. The CWPP emphasizes the importance of continued fuel reduction, defensible space, and fire-safe development standards to reduce the risk associated with future wildfire events.

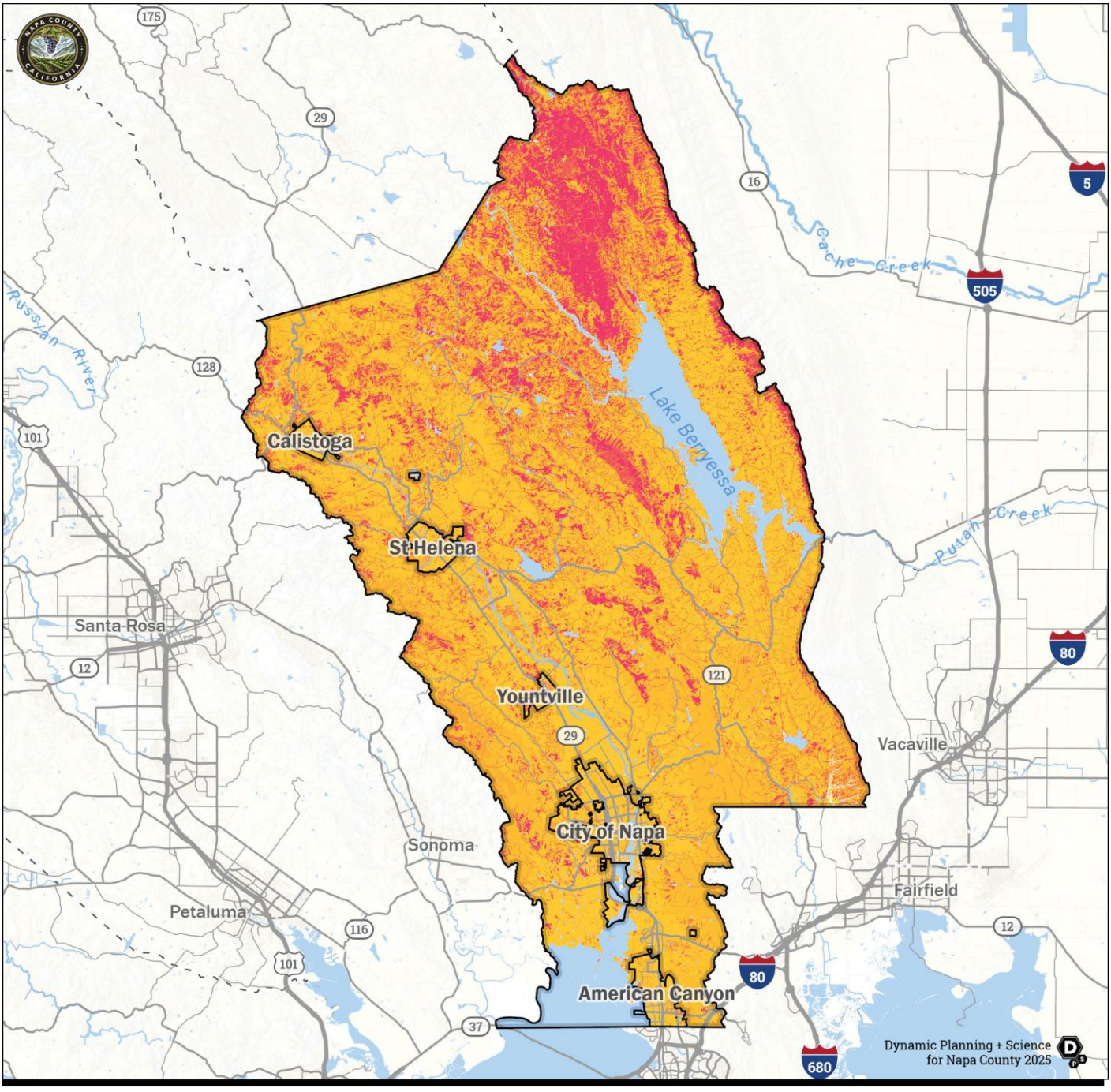


Figure 3-4: Mean Fire Return Interval (MFRI) Map

3.3.1.5 Severity

Wildfire severity in Napa County ranges from small, quickly contained vegetation fires to large, high-intensity wildfires capable of causing widespread damage to structures, infrastructure, agricultural resources, and natural areas. The severity of a wildfire event depends on a combination of fuel conditions, weather, topography, and the proximity of development to wildland vegetation. Because Napa County contains extensive grasslands, oak woodland, chaparrals, and forest fuels located in steep terrain and wildland-urban interface areas, wildfire events have the potential to become large, fast-moving, and difficult to control.

Areas located within High and Very High Fire Hazard Severity Zones, Figure 3-5, are most likely to experience severe wildfire behavior. These areas are generally located in the mountainous and foothill regions of the County, including the Mayacamas Mountains, the Vaca Range, and other upland areas where vegetation is dense and access may be limited. Fires burning in these areas can spread rapidly upslope, generate long flame lengths, and produce ember showers that ignite structures at a distance. Strong winds and low humidity can further increase fire intensity and allow fires to move quickly across large areas. These conditions have contributed to several major wildfire events in Napa County, including the Atlas Fire, Nunn Fire, and the LNU Lightning Complex.

Wildfire severity is also influenced by the type and age of vegetation fuels. Grass fuels can support fast-moving fires that spread quickly across open areas, while chaparral and brush fuels can produce intense heat and long flame lengths. Forest and heavy timber fuels can support longer-duration fires that are difficult to extinguish and may continue burning for extended periods. Older vegetation and accumulated dead material can increase fire intensity and make suppression more difficult. During drought conditions, even normally moist fuels such as oak woodland and conifer forest may burn with high intensity.

Development in the wildland-urban interface increases the potential severity of wildfire events because structures, utilities, and transportation routes may be exposed to fire. Homes located in hillside and rural areas may be difficult to access during an emergency, and limited road networks can complicate evacuation and firefighting operations. Fires that reach developed areas may transition from wildland fire to structure-to-structure fire, increasing the potential for large losses. In addition to direct fire damage, severe wildfire events in Napa County have caused evacuations, road closures, power outages, poor air quality, and damage to water supply and natural resources.

Weather conditions play a major role in determining wildfire severity. Periods of high temperature, low humidity, and strong winds can create extreme fire behavior and allow multiple fires to occur at the same time. Lightning storms, wind events, and prolonged drought have contributed to several of the most severe wildfire incidents affecting Napa County and Northern California. Climate change is expected to increase the likelihood of extreme fire weather conditions, which may lead to more severe wildfire events in the future.

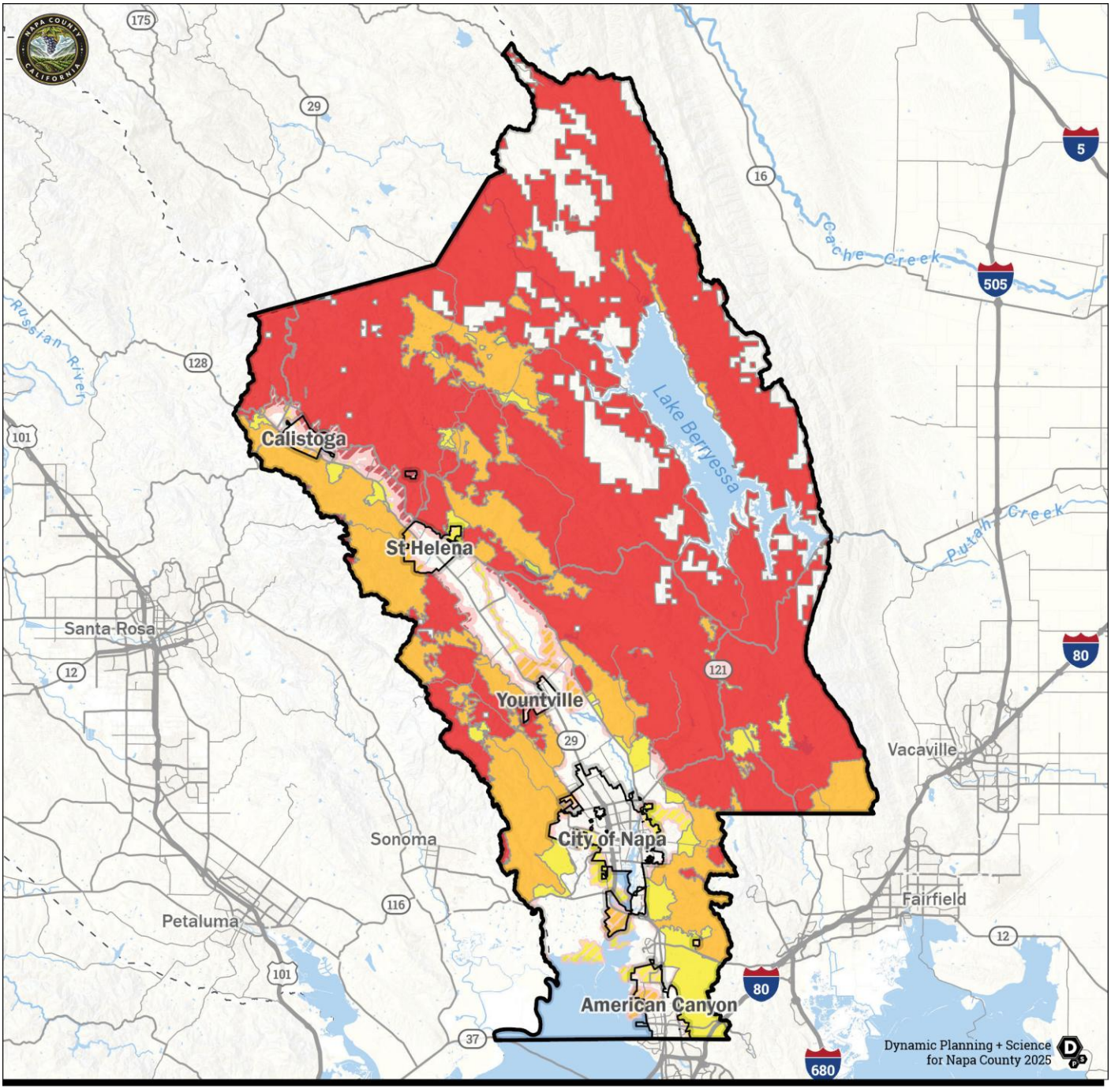


Figure 3-5: Fire Hazard Severity Zones

3.3.1.6 Warning Time

Warning time for wildfire events in Napa County can vary significantly depending on the cause of ignition, weather conditions, and location of the fire. In some cases, wildfire may develop slowly and provide hours or days of warning, while in other situations fires can spread rapidly with little advance notice. Because Napa County contains large areas of grassland, chaparral, woodland, and forest fuels, and frequently experiences hot, dry, and windy conditions during fire season, warning time for wildfire is often limited, particularly during extreme fire weather events.

Wildfires caused by human activity, such as equipment use, vehicles, or powerline failures, may occur without warning and can spread quickly if fuels are dry. Lightning-caused fires may occur during summer thunderstorms and can ignite multiple fires across a wide area at the same time. Events such as the 2020 lightning storms that caused the LNU Lightning Complex demonstrated that numerous fires can start within a short period, reducing the time available for response and evacuation.

Wind-driven fires present the greatest challenge for warning and evacuation. Strong winds, low humidity, and steep terrain can allow fires to spread rapidly toward populated areas, sometimes during nighttime hours when residents are less likely to be aware of the danger. Past wildfire events in Napa County and the surrounding region have shown that fire conditions can change quickly, requiring evacuation warnings and orders to be issued with little notice.

Napa County uses multiple systems to provide warning and notification during wildfire incidents. Emergency alerts may be issued through the County's emergency notification systems, law enforcement and fire agency notifications, wireless emergency alerts, and public information releases. The EOP describes procedures for issuing evacuation warnings and orders, activating the Emergency Operations Center, and coordinating public information during large incidents. These systems are intended to provide residents with as much notice as possible; however, the unpredictable nature of wildfire means that warning time may still be limited in some situations.

Because wildfire can occur with little advance notice and may spread rapidly under certain conditions, the warning time for wildfire in Napa County is considered minimal to moderate, with the possibility of very little warning during extreme fire weather events.

3.3.1.7 Wildfire Vulnerability Assessment

Napa County remains vulnerable to wildfire impacts despite ongoing efforts to reduce risk through planning, policies, and mitigation programs. This section evaluates wildfire vulnerability in relation to people, property, critical facilities, and infrastructure. Estimates of population exposure, parcel values, critical facilities, and lifeline infrastructure were developed by overlaying these asset inventories with CAL FIRE's Fire Hazard Severity Zones (FHSZs). Figure 3-6 provides a summary of wildfire exposure across the county. It is important to note that this risk assessment evaluates exposure only; results are based on whether assets are located within mapped hazard zones and do not account for structural characteristics, defensible space, or site-specific mitigation measures.

Wildfire vulnerability in Napa County is shaped by the interaction of hazard exposure, land use patterns, and environmental conditions. As shown in Figure 3-6, much of the county, particularly in unincorporated and upland areas, is located within High and Very High Fire Hazard Severity Zones and includes extensive WUI areas where residential development, agricultural operations, and infrastructure are adjacent to or intermixed with flammable vegetation. Additionally, large portions of the county exhibit relatively short fire return intervals associated with grassland and light fuel types, increasing the likelihood of frequent ignitions, while forested and shrub-dominated areas may experience less frequent but more intense fire behavior. These conditions, combined with steep terrain, limited access in rural areas, and reliance on transportation and utility corridors that traverse fire-prone landscapes, contribute to elevated wildfire risk.

It is important to recognize that FHSZs have a regulatory basis; CAL FIRE is responsible for their designation under state law, and these zones trigger specific requirements in the California Building and Fire Codes. However, FHSZs are designed primarily to represent hazards associated with wildland fuels and do not fully capture the complexity of wildfire risk, including ember-driven structure ignition and the potential for urban conflagration. Additionally, insurance providers often rely on proprietary risk models that incorporate higher-resolution data and localized conditions, which may result in different risk classifications at the parcel level. Understanding these distinctions is critical for effective risk communication, land use planning, and prioritization of mitigation actions to enhance Napa County's resilience to future wildfire events.

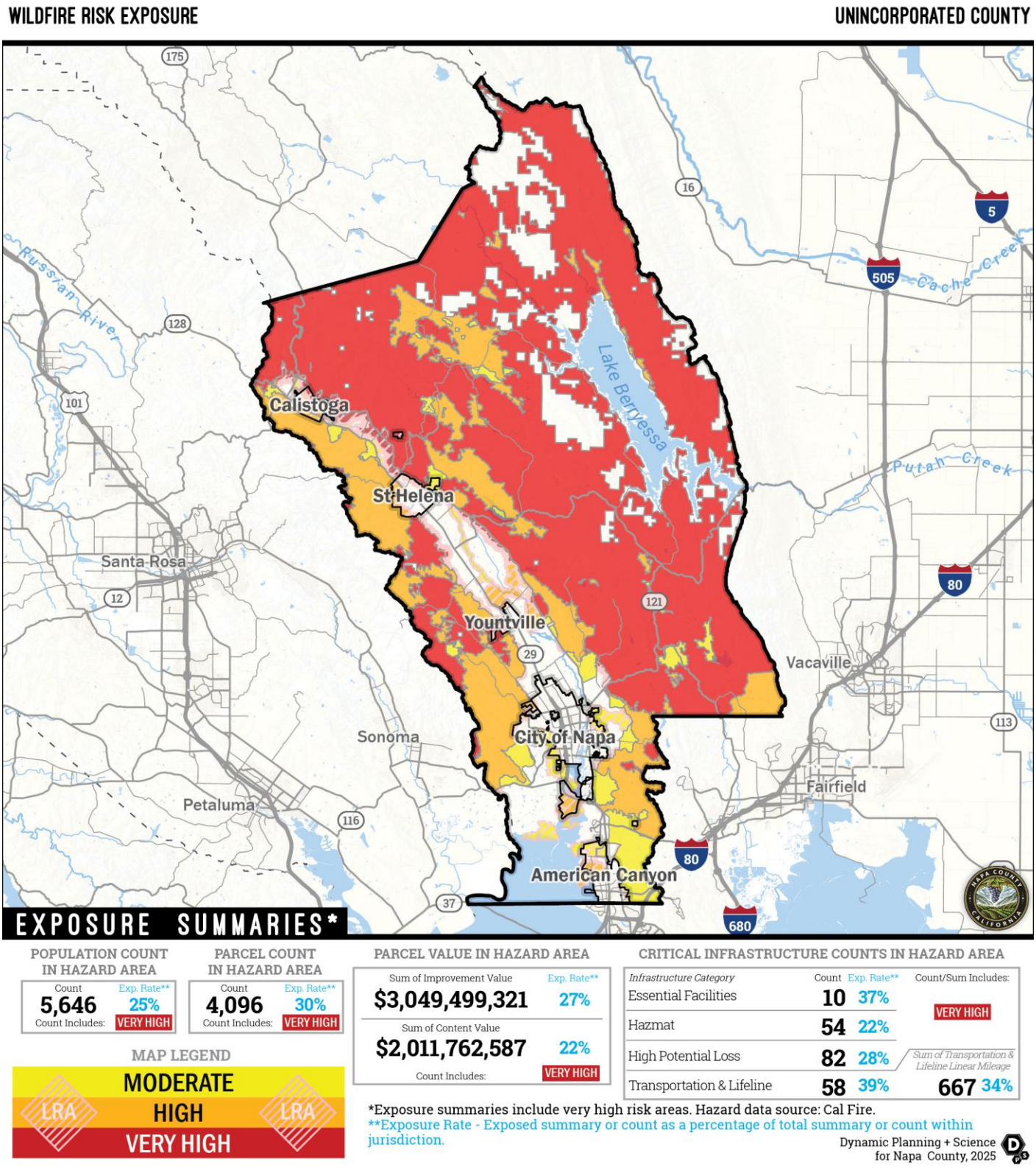


Figure 3-6: Exposure Summary – Napa County Wildfire Risk

3.3.1.7.1 Population

Wildfire exposure in the unincorporated areas of Napa County is substantial, with a majority of residents located within mapped Fire Hazard Severity Zones (FHSZ). As shown in Figure 3-7 and Table 3-6, almost 14,000 people (61% of the unincorporated population) reside within Moderate, High, or Very High hazard areas, demonstrating that wildfire a widespread hazard affecting a significant portion of the county's population.

The highest concentration of exposed residents in the High and Very High FHSZs is located in the foothills and mountainous areas on either side and to the north of the Napa Valley, and up to Lake Berryessa, where more than 40% of the unincorporated county's population resides.

High and Very High FHSZs often coincide with State and Federal Responsibility Areas (SRAs and FRAs). These jurisdictional distinctions indicate additional layers of vulnerability, with SRAs and FRAs being rural by definition. Residents living in High or Very High FHSZs, particularly in or near FRAs, are generally among the most exposed populations and may also be more vulnerable due to access and service limitations. These communities are often located in rural or isolated areas with limited road access, longer emergency response times, and fewer nearby services. Evacuation in these areas can be challenging due to narrow roads, limited route options, and potential congestion during wildfire events.

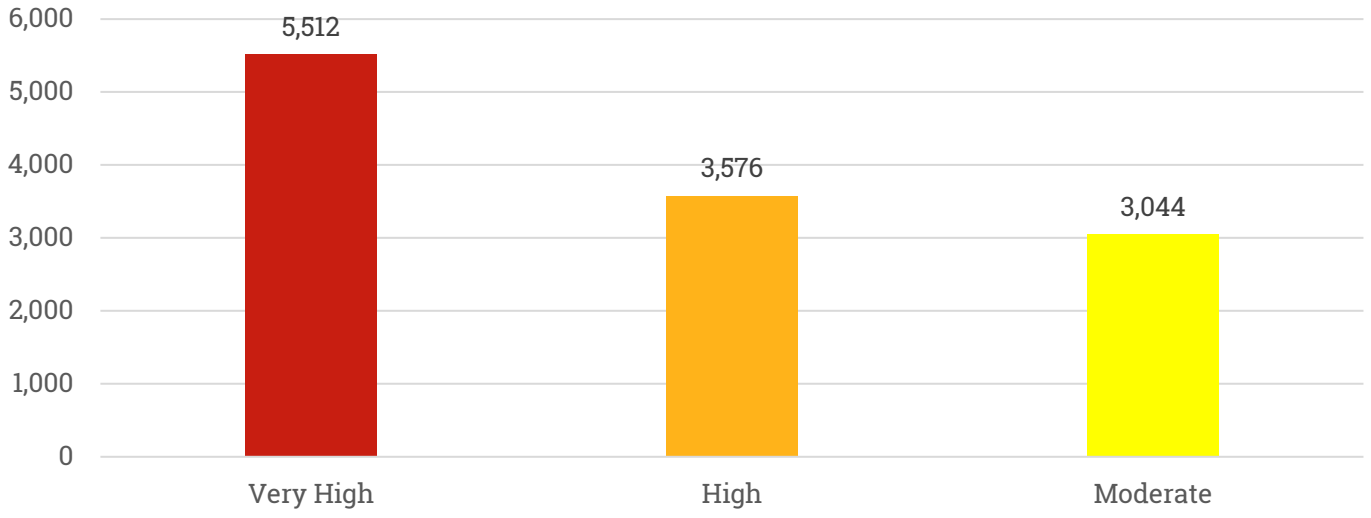


Figure 3-7: Napa County Population Exposure to Wildfire

Table 3-6: Napa County Population Exposure to Wildfire

	Total Population
Unincorporated County	22,468

Wildfire Severity Zone (FHSZ)	Population Count	% of Total

Moderate	**3,862**	**17.19%**
LRA Moderate	2,824	*12.57%*
SRA Moderate	1,038	*4.62%*
High	**4,157**	**18.50%**
LRA High	582	*2.59%*
SRA High	3,575	*15.91%*
Very High	**5,646**	**25.13%**
LRA Very High	205	*0.91%*
SRA Very High	5,441	*24.22%*
Total	**13,664**	**60.82%**

Disproportionately Impacted Populations

Wildfire impacts in Napa County are not experienced equally across all populations. Certain groups may be disproportionately impacted due to social, economic, geographic, or physical vulnerabilities that limit their ability to prepare for, respond to, or recover from wildfire events.

Older adults, individuals with disabilities, and those with limited mobility may face additional challenges during evacuation, particularly in remote areas where assistance may be delayed. Similarly, low-income households may have fewer resources to implement mitigation measures such as defensible space, home hardening, or insurance coverage, increasing their vulnerability to wildfire impacts.

Napa County's agricultural workforce, including farmworkers, may also be disproportionately affected by wildfire. Many agricultural workers are employed outdoors in areas that overlap with wildfire-prone landscapes and may be exposed to hazardous smoke conditions during fire events. In addition, language barriers, housing constraints, and transportation limitations may reduce access to emergency information and evacuation resources.

Climate change is expected to exacerbate existing disparities in wildfire vulnerability across Napa County by increasing the frequency, duration, and intensity of wildfire conditions. Rising temperatures, prolonged drought, and shifts in precipitation patterns contribute to drier vegetation and longer fire seasons, increasing the likelihood that communities, particularly those in High and Very High Fire Hazard Severity Zones, will experience repeated or more severe wildfire impacts. These conditions may place additional strain on vulnerable populations, including older adults, low-income households, and outdoor workers, who may have limited capacity to adapt to worsening conditions.

Increased wildfire activity also contributes to more frequent and prolonged smoke exposure, which can disproportionately affect individuals with pre-existing health conditions and those without access to adequate indoor air quality protections. As climate-driven wildfire risk increases, targeted mitigation, outreach, and resilience strategies will be essential to reduce disproportionate impacts and protect vulnerable populations.

3.3.1.7.2 Property

Wildfire exposure to property in unincorporated Napa County is substantial. As shown in Table 3-7, approximately 63.5% of parcels are located within Moderate, High, or Very High Fire Hazard Severity Zones. These areas represent over $10.4 billion in total property value, accounting for roughly half of all property value in the unincorporated county, underscoring the significant economic risk posed by wildfire.

The greatest concentration of exposure occurs in Very High and High Fire Hazard Severity Zones, which are largely located in State Responsibility Areas (SRAs). This reflects the pattern of development in hillside, rural, and wildland-urban interface areas, where wildfire risk is highest and access may be more limited.

Overall, the distribution of exposure closely follows the County's topography, with high-value residential properties, agricultural lands, and rural development concentrated in fire-prone areas. In addition to potential structural losses, wildfire can damage infrastructure, disrupt access, and impact essential services, increasing the overall consequences of an event.

Vineyards and wineries are also exposed to wildfire risk. While vineyards may provide some fuel reduction benefits, associated facilities remain vulnerable to fire damage, smoke impacts, and operational disruption, which can result in broader economic impacts across the County.

Table 3-7: Napa County Property Exposure to Wildfire

	Total Parcels	Total Market Value ($)	Total Content Value ($)	Total Value ($)
Unincorporated County	13,668	$11,215,199,644	$9,248,691,039	$20,463,890,683

Wildfire Severity Zone (FHSZ)	Parcel Count	% of Total	Market Value Exposure ($)	Content Value Exposure ($)	Total Exposure ($)	% of Total
Moderate	**2,026**	**14.82%**	**$1,380,582,754**	**$958,926,985**	**$2,339,509,738**	**11%**
LRA Moderate	820	*6.0%*	$622,654,135	$461,532,370	$1,084,186,505	*5.3%*
SRA Moderate	1,206	*8.8%*	$757,928,618	$497,394,615	$1,255,323,233	*6.1%*
High	**2,555**	**18.69%**	**$1,729,602,921**	**$1,286,514,012**	**$3,016,116,933**	**15%**
LRA High	494	*3.6%*	$339,656,856	$279,327,266	$618,984,121	*3.0%*
SRA High	2,061	*15.1%*	$1,389,946,065	$1,007,186,747	$2,397,132,812	*11.7%*
Very High	**4,096**	**29.97%**	**$3,049,499,321**	**$2,011,762,587**	**$5,061,261,909**	**25%**
LRA Very High	493	*3.6%*	$420,642,535	$344,341,570	$764,984,105	*3.7%*
SRA Very High	3,603	*26.4%*	$2,628,856,786	$1,667,421,017	$4,296,277,803	*21.0%*
Total	**10,703**	**63.5%**	**$6,159,684,996**	**$4,257,203,585**	**$10,416,888,580**	**50.9%**

3.3.1.7.3 Critical Facilities & Infrastructure

Wildfire poses a significant risk to critical facilities and infrastructure in unincorporated Napa County, particularly within High and Very High FHSZs. These facilities and lifelines are essential to emergency response, public safety, economic activity, and community lifelines, and their disruption before, during, or after a wildfire event can have cascading impacts across the county. As shown in Table 3-8 and Table 3-9 a significant number and miles of these assets are located within wildfire-prone areas.

Critical Facilities

Wildfire exposure to critical facilities in Napa County is significant, particularly in the highest hazard areas. As shown in Table 3-8, over 200 critical facilities and high-consequence sites are located within Very High Fire Hazard Severity Zones, with additional concentrations in High and Moderate zones. This indicates that a large share of the County's most important assets are located in areas most susceptible to severe wildfire behavior.

Key emergency response facilities—including fire stations, essential service facilities, and a hospital—are located within these high hazard areas. While this supports response capabilities, it also highlights that the same facilities needed during emergencies are themselves at risk, which could impact response effectiveness during major wildfire events.

Facilities that serve vulnerable populations or provide essential services—such as dams, shelters, mobile home parks, and community facilities—are also widely distributed in wildfire-prone areas. Damage to these sites could have disproportionate impacts on public safety and recovery, particularly for populations with limited resources or mobility.

Hazardous material sites present an additional concern. Dozens of these sites are located within wildfire hazard zones, creating the potential for secondary environmental and public health impacts if damaged during a fire event.

Transportation & Lifelines

Wildfire exposure to transportation and utility lifeline infrastructure is extensive across Napa County. As shown in Table 3-9, more than 600 miles of roadway and linear infrastructure are located within Very High Fire Hazard Severity Zones, with hundreds more miles in High and Moderate zones. These networks are critical for evacuation, emergency response, and daily economic activity.

A large portion of this infrastructure is located in rural and hillside areas, where road networks are often limited and access may be constrained. During wildfire events, these conditions can significantly complicate evacuations, delay emergency response, and isolate communities.

Utility systems, including electrical transmission lines, substations, water systems, and wastewater facilities, are also exposed to wildfire risk. Damage to these systems can result in widespread power outages, loss of communications, and disruption of critical services, creating cascading impacts across the County.

Other key transportation assets, including bridges and regional connections, are also located within wildfire-prone areas. Damage to these assets can further limit access and prolong recovery efforts following a major event.

Table 3-8: Napa County Critical Facilities Exposure to Wildfire

Infrastructure Type	Critical Infrastructure - Wildfire Severity Zone								
	SRA Very High	LRA Very High	Very High Total	SRA High	LRA High	High Total	SRA Moderate	LRA Moderate	Moderate Total
Essential Facilities	10	-	10	4	-	4	2	1	3
EOC	-	-	-	-	-	-	-	-	-
Fire Station	9	-	9	2	-	2	2	1	3
Hospital	1	-	1	-	-	-	-	-	-
Law Enforcement	-	-	-	2	-	2	-	-	-
High Potential Loss	81	1	82	34	34	68	17	4	21
Adult Residential Care	-	-	-	-	-	-	-	-	-
Child Care Center	4	-	4	1	-	1	1	-	1
Church	6	-	6	3	-	3	3	-	3
Communication Tower	-	-	-	6	-	6	4	1	5
Dam	25	-	25	17	-	17	5	-	5
Emergency Shelter	5	-	5	1	2	3	-	1	1
Farm Worker Housing	-	-	-	-	2	2	-	1	1
Historic Building	1	1	2	2	-	2	1	-	1
Library	-	-	-	1	-	1	-	-	-
Mobile Home Park	5	-	5	-	-	-	-	-	-
Res Elder Care Facility	5	-	5	-	1	1	-	-	-
Private School	3	-	3	-	-	-	-	-	-
Public School	-	-	-	-	-	-	-	-	-
Real Property Asset	27	-	27	3	29	32	3	1	4
Transportation and Lifeline	49	9	58	14	10	24	10	12	22
Airport	3	-	3	-	-	-	2	1	3
Bridge	22	9	31	12	8	20	5	9	14
Bus Stop	-	-	-	-	-	-	-	-	-
HMMWC Asset	-	-	-	-	-	-	-	-	-
HMMWC Dam	-	-	-	-	-	-	-	-	-
HMMWC Hydrant	-	-	-	-	-	-	-	-	-
NG Station	-	-	-	-	-	-	1	-	1

Critical Infrastructure - Wildfire Severity Zone									
Infrastructure Type	SRA Very High	LRA Very High	Very High Total	SRA High	LRA High	High Total	SRA Moderate	LRA Moderate	Moderate Total
Power Plant	-	-	-	-	2	2	-	-	-
Substation	3	-	3	-	-	-	2	-	2
Wastewater Treatment Facility	10	-	10	-	-	-	-	-	-
Water Supply Intake	1	-	1	-	-	-	-	-	-
Water Tank	7	-	7	2	-	2	-	2	2
Water Treatment Facility	3	-	3	-	-	-	-	-	-
Hazmat	47	7	54	24	15	39	13	22	35
Geotracker CleanupSite	1	-	1	-	-	-	-	-	-
HWTS Active Facility	44	7	51	24	14	38	13	22	35
Landfill	2	-	2	-	1	1	-	-	-
Grand Total	**187**	**17**	**204**	**76**	**59**	**135**	**42**	**39**	**81**

**Real Property Assets are digitized insurance rolls for demonstrating value and ownership and may have overlapping points with other categories such as fire stations and law enforcement.*

Table 3-9: Napa County Lifeline Infrastructure Exposure to Wildfire

Lifelines (miles) - Wildfire Severity Zone									
Infrastructure Type (Linear)	SRA Very High	LRA Very High	Very High Total	SRA High	LRA High	High Total	SRA Moderate	LRA Moderate	Moderate Total
Levee	-	-	-	-	-	-	-	-	-
NG Pipeline	-	0.00	0.00	2.61	0.00	2.61	6.84	4.96	11.80
Railroad	-	-	-	0.07	-	0.07	3.01	0.05	3.06
Transmission Line	31.93	-	31.93	29.75	0.01	29.76	16.99	3.78	20.77
Street OSM	568.79	0.06	574.83	320.71	0.05	320.76	126.28	58.95	185.22
Highway & Interstate	-	-	-	-	-	-	2.67	-	2.67
Major Road	10.84	-	10.84	3.85	0.00	3.85	5.13	1.74	6.87
Residential Road	91.99	0.00	94.51	64.13	0.00	64.13	16.85	9.85	26.69
Road - Secondary	50.77	-	50.77	6.02	-	6.02	8.60	3.30	11.89
Road - Tertiary	60.80	0.00	63.45	33.78	-	33.78	7.32	0.88	8.20
Service Road	296.25	0.06	297.12	201.14	0.05	201.18	80.80	39.05	119.85
Unclassified	58.14	-	58.14	11.79	-	11.79	4.91	4.13	9.05
Grand Total	**600.72**	**0.06**	**606.77**	**353.15**	**0.05**	**353.20**	**153.12**	**67.74**	**220.86**

3.3.1.8 Development Trends

Wildfire risk in Napa County is closely tied to historical and future development patterns, particularly the expansion of residential and agricultural uses into wildfire-prone areas. Development trends influence both the exposure of people and property to wildfire and the potential consequences of wildfire events, making land use a critical factor in long-term hazard vulnerability.

Past Development Patterns

Historically, Napa County has maintained a strong emphasis on agricultural preservation and limited urban expansion, with most growth directed toward incorporated cities and designated urbanized areas. However, significant development has occurred in rural and hillside areas, including residential estates, vineyard-related structures, and agricultural facilities located within or adjacent to wildland vegetation. These areas often fall within SRA's and High or Very High Fire Hazard Severity Zones, where wildfire hazard is elevated due to terrain, fuel conditions, and limited access.

Development in the wildland-urban interface (WUI) has increased the number of structures exposed to wildfire and introduced additional ignition sources such as vehicles, equipment, and utilities. Many of these developments are served by narrow roads, long driveways, and limited water supply infrastructure, which can complicate emergency response and evacuation. As a result, past development patterns have contributed to increased wildfire vulnerability in certain parts of the County, particularly in mountainous and rural areas.

Anticipated Future Growth

Future development in Napa County is expected to remain relatively constrained and focused within existing communities, consistent with General Plan policies that prioritize agricultural land protection and limit sprawl. However, some level of growth is anticipated in both incorporated areas and unincorporated communities, including infill development, redevelopment, and continued use of rural properties for residential and agricultural purposes.

Even with limited overall growth, incremental development in wildfire-prone areas may continue, particularly in hillside locations and rural parcels. This type of growth can increase the number of structures located within High and Very High Fire Hazard Severity Zones and may place additional demand on emergency services, evacuation routes, and infrastructure systems. In addition, ongoing investment in vineyards and winery facilities may expand the presence of high-value assets in wildfire-exposed areas.

3.3.1.9 Climate Change Impacts

Climate change is expected to significantly influence wildfire risk in Napa County by increasing the frequency, duration, and intensity of conditions that contribute to wildfire ignition and spread. Rising temperatures, prolonged drought, reduced soil moisture, and changes in precipitation patterns contribute to drier vegetation and longer fire seasons. These changes increase the likelihood of both frequent small fires

and large, high-severity wildfire events. The County's mountainous terrain, extensive vegetation, and development in the wildland-urban interface further amplify these risks, particularly in areas already classified as High and Very High Fire Hazard Severity Zones.

Direct Impacts

Climate-driven wildfire conditions may lead to more frequent exposure of populations and structures to wildfire hazards. Direct impacts include increased risk of structure ignition, property loss, displacement of residents, and damage to critical infrastructure such as transportation networks, power systems, and water supply facilities. Higher temperatures and prolonged dry periods can also increase vegetation stress and fuel accumulation, allowing fires to burn more intensely and spread more rapidly. These impacts are expected to be most severe in rural and hillside areas where development is located near dense vegetation and emergency access may be limited.

Secondary & Compounding Hazards

Climate change also contributes to secondary hazards associated with wildfire. Post-fire environments are more susceptible to erosion, landslides, debris flows, and sedimentation, particularly during heavy rainfall events. Increased wildfire frequency may therefore lead to greater risk of slope instability and flooding in burn scar areas. In addition, wildfire events can cause power outages, infrastructure failure, and disruption to transportation systems, especially where utilities and roadways traverse wildfire-prone landscapes.

Extended wildfire seasons and more frequent fire events can also lead to cumulative impacts, where communities experience repeated disruptions over time. These compounding effects can strain emergency response systems, delay recovery, and increase long-term vulnerability for both people and infrastructure.

Public Health Impacts

Wildfire smoke is one of the most significant public health concerns associated with climate-driven wildfire. Smoke contains fine particulate matter (PM2.5) and other pollutants that can cause respiratory and cardiovascular illness. As wildfire frequency increases, residents may experience more frequent and prolonged periods of poor air quality.

Sensitive populations, including older adults, children, individuals with pre-existing health conditions, and outdoor workers, are particularly vulnerable to smoke exposure. Agricultural workers, who are a key part of Napa County's workforce, may face elevated risk due to prolonged outdoor exposure during wildfire season. Repeated smoke events can also contribute to chronic health issues and increased healthcare demand.

Social & Economic Impacts

Climate change may also exacerbate existing social and economic vulnerabilities. Wildfire events can lead to temporary or long-term displacement, loss of housing, and increased insurance costs or reduced

insurance availability in high-risk areas. These impacts may disproportionately affect low-income households, renters, and residents in rural communities who have fewer resources to recover from disaster.

Disruptions to the County's agricultural economy, including vineyards and wineries, may also have broader economic consequences. Smoke exposure can affect crop quality, and wildfire events can disrupt tourism, employment, and local businesses. These impacts may disproportionately affect workers in agriculture, hospitality, and service industries.

3.3.1.10 Wildfire Hazard Problem Statements

As part of the mitigation action identification process, the Napa County Planning Team developed areas of concern (i.e., problem statements) that summarize the county's most pressing wildfire-related vulnerabilities and challenges. The problem statements were developed based on the updated risk assessment and vulnerability analysis contained herein, as well as the team's local knowledge and experience and community input.

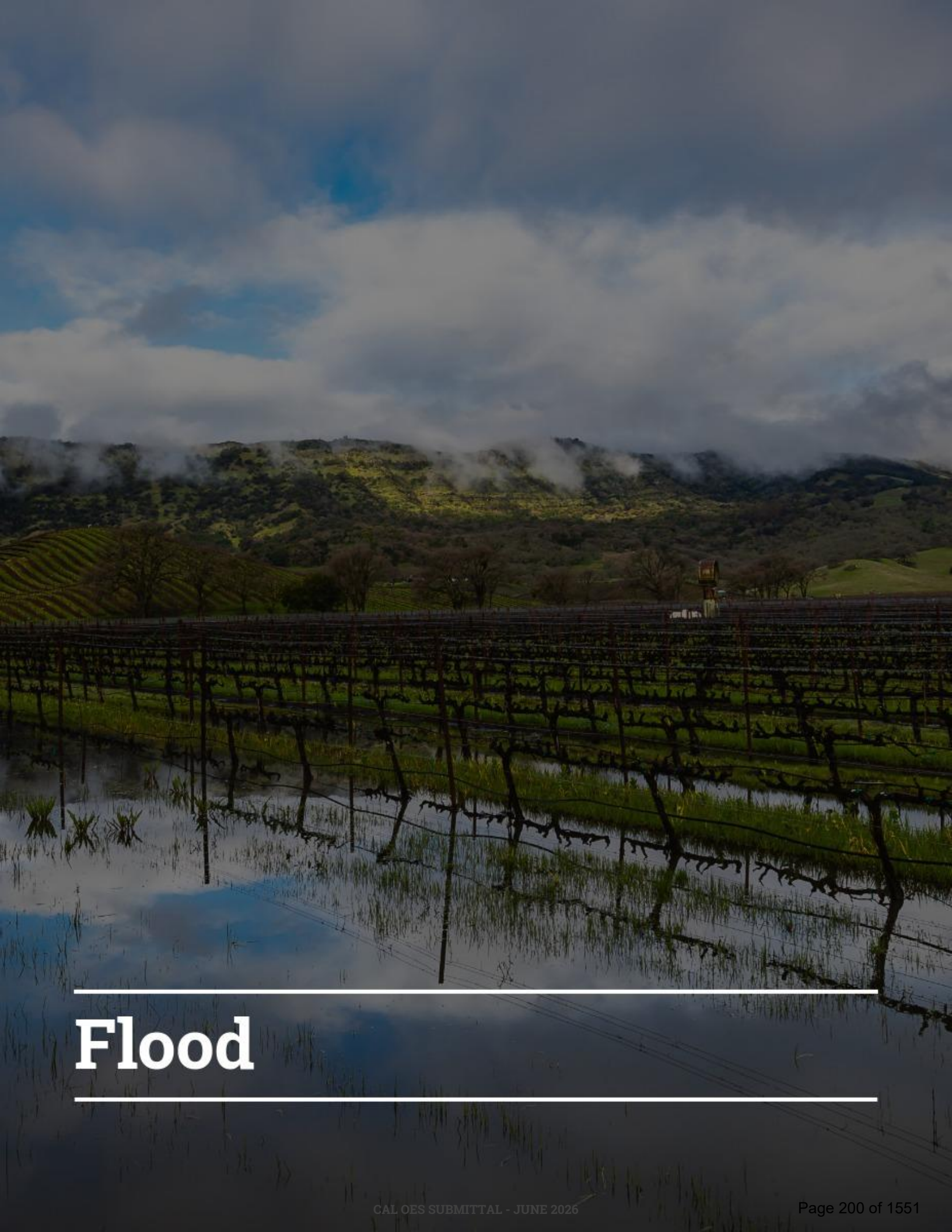
The problem statements address a broad spectrum of concerns, from direct impacts on residents and vulnerable populations to threats to critical infrastructure, essential facilities, economic assets, natural resources, and long-term recovery. They also recognize systemic barriers to effective mitigation, such as fragmented land ownership and post-fire hazards.

These problem statements are not intended to be all-encompassing or to describe each and every issue associated with wildfire. Instead, they highlight the most urgent concerns that can be addressed within the scope of this MJHMP. Each statement will be linked to at least one mitigation action, ensuring that identified needs are met with specific, measurable, and equitable solutions. Table 3-10 presents the wildfire hazard problem statements for Napa County, along with their associated areas of concern and reference numbers for cross-linking to the mitigation actions in Table 4-4.

Table 3-10: Napa County Wildfire Hazard Problem Statements

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-CC-NCo-14	Wildfire	Threat	**Napa County**	Increasing average temperatures and changes in precipitation patterns associated with climate change are expected to increase the risk of wildfire in the County by approximately 10 to 20% by the end of the century.	ma-AH-NCo-5, ma-SW-NCo-83, ma-CC-NCo-15, ma-AG-NCo-1, ma-WF-NCo-90, ma-WF-NCo-96, ma-WF-NCo-94, ma-WF-NCo-95
ps-WF-NCo-153	Wildfire	Threat	**Napa County**	Angwin's primary evacuation and emergency access route, Howell Mountain Road, is narrow and winding with only two secondary routes, creating major evacuation and response challenges during wildfire event.	ma-WF-NCo-102, ma-WF-NCo-94

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-WF-NCo-154	Wildfire	Victim	**Napa County**	There are approximately 384 facilities and 991 miles of critical infrastructure located in High or Very High FHSZs, including key systems like power, water, bridges, and dams as well as high potential loss facilities like childcare centers and fire stations, which could be severely impacted or destroyed during a wildfire.	ma-WF-NCo-97, ma-AH-NCo-4, ma-WF-NCo-96, ma-WF-NCo-94, ma-WF-NCo-95
ps-WF-NCo-155	Wildfire	Threat	**Napa County**	Human activities, including equipment use, debris burning, and arson are the leading cause of wildfires in the Sonoma-Lake-Napa Unit, requiring enhanced prevention, enforcement, and public education.	ma-WF-NCo-95, ma-WF-NCo-101, ma-AH-NCo-6, ma-DR-NCo-26, ma-WF-NCo-90
ps-WF-NCo-156	Wildfire	Threat	**Napa County**	Many of the rural areas of the county, especially in the foothills and mountains, are heavily vegetated and in need of fuel management and access improvements to reduce wildfire risks to people, property, infrastructure, and the environment.	ma-WF-NCo-102, ma-AH-NCo-6, ma-WF-NCo-90, ma-WF-NCo-96, ma-WF-NCo-95
ps-WF-NCo-164	Wildfire	Victim	**Napa County**	Thousands of county residents (approximately 7% of the total population) live in High or Very High FHSZs and are at risk of injury, death, displacement, and property loss.	ma-WF-NCo-90, ma-WF-NCo-91, ma-WF-NCo-92, ma-CC-NCo-15, ma-WF-NCo-96, ma-WF-NCo-95
ps-WF-NCo-172	Wildfire	Threat	**Napa County**	Steep slopes, limited fire suppression access, inadequate water supply, and flammable vegetation create major wildfire risks for residential development in hilly areas of unincorporated Napa County.	ma-WF-NCo-91, ma-WF-NCo-92, ma-WF-NCo-101, ma-WF-NCo-90, ma-WF-NCo-96, ma-WF-NCo-95
ps-WF-NCo-181	Wildfire	Impact	**Napa County**	Firesafe Councils need greater financial capacity to support coordination, education, and outreach in unincorporated areas.	ma-WF-NCo-93, ma-WF-NCo-95, ma-WF-NCo-90, ma-WF-NCo-96
ps-WF-NCo-182	Wildfire	Threat	**Napa County**	BAAQMD regulations limit the use of prescribed burns, making it more difficult to reduce hazardous fuels in fire-prone areas of unincorporated Napa County.	ma-WF-NCo-96



Flood

3.3.2 Flood Hazard Profile



Flooding is one of the three primary natural hazards in California, along with earthquakes and wildfires, and statewide it represents the second most destructive source of hazard vulnerability and risk. (CalOES, 2018) Flooding is a priority hazard for Napa County due to its exposure to both riverine and coastal flooding, steep watershed conditions that produce rapid runoff, and the presence of populated areas and critical infrastructure in floodplains.

A floodplain is the low-lying land adjacent to rivers, creeks, and other watercourses that becomes inundated during flood events. In Napa County, floodplains range from broad alluvial valleys associated with the Napa River system to narrower, confined corridors along tributaries such as Napa Creek, Salvador Creek, and Tulucay Creek, as identified in the countywide Flood Insurance Study . These areas function as dynamic natural systems that provide important benefits, including temporary storage of floodwaters, sediment transport, groundwater recharge, and water quality improvement, all of which help reduce downstream flood risk. Local watershed management programs further support these functions through ongoing channel maintenance, restoration, and flood management activities . However, when rivers are separated from their floodplains by levees, channel modifications, or development, these natural processes are diminished, often resulting in increased flood depths and velocities, greater downstream impacts, and reduced ecological function.

In Napa County, flooding is most pronounced along the Napa River corridor, where broad valley topography, historical floodplain development, and converging tributaries contribute to recurring overbank flooding during major storm events. Unincorporated areas are particularly vulnerable, as many rural properties, agricultural lands, and transportation corridors are located within or adjacent to natural floodplains and rely on a combination of limited structural protection and natural drainage systems. In these areas, flooding is often driven by a combination of watershed-scale runoff, localized drainage constraints, and sedimentation that reduces channel capacity over time. Floodplains in these settings may extend across wide valley floors or follow narrower tributary channels, functioning as natural storage and conveyance areas that help moderate peak flows. However, land use patterns, aging infrastructure, and modifications to natural channels can constrain these functions, increasing the frequency and extent of flooding impacts in unincorporated Napa County, particularly along smaller creeks and agricultural drainage networks connected to the Napa River system.

Definitions & Hazard Area Designations

Flood hazards are mapped and regulated using specific terms and categories established by the Federal Emergency Management Agency (FEMA) through its Flood Insurance Rate Maps (FIRMs) and Flood Insurance Studies (FIS). Understanding these definitions is essential for interpreting flood hazard maps, administering floodplain management regulations, and guiding development in at-risk areas. The terms described in Table 3-11 apply to flood hazard mapping and floodplain management in Napa County and are consistent with FEMA standards, including inland and coastal hazard area designations.

Table 3-11: Flood Hazard Terms

Term	Description
100-YR / 1% Annual Chance Floodplain	The boundaries of the 100-year floodplain coincide with the base flood and an annual flood risk of 1%, consisting of both the regulatory floodway and the flood fringe. These areas are identified as various A Zones on FIRMs, depending on the risk and level of study conducted.
500-YR / 0.2% Annual Chance Floodplain	The boundaries of the 500-year floodplain encompass the 100-year floodplain and coincide with an annual risk of 0.2%. The 500-year floodplain is advisory only for NFIP purposes.
Base Flood	A flood having a 1% chance of being equaled or exceeded in any given year. This is the regulatory standard also referred to as the "100-year flood." The base flood is the national standard used by the NFIP and all federal agencies for the purposes of requiring the purchase of flood insurance and regulating new development.
Base Flood Elevation (BFE)	The elevation of surface water resulting from the base flood that has a 1% chance of equaling or exceeding that level in any given year. BFEs are shown on Flood Insurance Rate Maps (FIRM) for various flood zones where detailed studies have been conducted (e.g., Zone AE and V Zones).
Best Available Map (BAM)	The California Department of Water Resources (DWR) provides Best Available Maps displaying 100-, 200-, and 500-year floodplains across the state as supplemental information to FIRMs.
Coastal A Zone (CAZ)	Coastal A Zones are within the SFHA, landward of a V Zone or along the open coast, where wave heights are between 1.5 and 3 feet during the base flood event. Structures in CAZs are subject to design and construction standards similar to V Zones.
Coastal High-Hazard Area (V Zones)	V Zones are areas along open coasts subject to high-velocity wave action from storms or other triggering events. These zones require elevated construction methods and other protective measures that can withstand the additional forces of waves.
Flood Fringe	This is the remaining portion of the 100-year floodplain, excluding the floodway. This zone can be obstructed or developed if certain criteria are met.
Flood Insurance Rate Map (FIRM)	The official map of a community on which FEMA has delineated the SFHAs, BFEs, and the insurance risk premium zones applicable to a particular community.
Flood Insurance Study (FIS)	A compilation and presentation of flood risk data accompanying the FIRMs for specific watercourses, lakes, and coastal flood hazard areas within a community. When a flood study is completed for the NFIP, the information and maps are assembled into an FIS report, which contains detailed flood elevation data in flood profiles and tables.
Floodway	The channel of a river or other watercourse and the adjacent land areas, where the highest velocities and damage potential are present during a flood, that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height. Communities must regulate development in these floodways to ensure that there are no increases in upstream flood elevations.
Limit of Moderate Wave Action (LiMWA)	The Limit of Moderate Wave Action is a line shown on FIRMs that marks the inland limit of wave heights between 1.5 and 3 feet during the base flood event. Areas seaward of the LiMWA face higher risks from wave damage and must meet applicable construction standards.
Special Flood Hazard Area (SFHA)	An area having special flood, mudflow, or flood-related erosion hazards and shown on a Flood Insurance Rate Map (FIRM), including all A and V Zones. The SFHA is the area where the National Flood Insurance Program's (NFIP) floodplain management regulations must be enforced and where the mandatory purchase of flood insurance may apply.

Floodplain Ecosystems

Floodplains are critical natural systems that support diverse and highly productive ecosystems. These areas often host an abundance of plant and animal species, with densities many times greater than those found along the river channel alone. Periodic flooding replenishes soils with nutrients from decomposed organic material, triggering rapid growth in plants and microorganisms. This productivity attracts a wide range of wildlife, including migratory birds and opportunistic feeders, and sustains agricultural uses due to the fertility of the soil. Vegetation in floodplains and riparian areas is typically adapted to disturbance, with species that are fast-growing and tolerant of saturated soils and root disruption.

Undisturbed or restored floodplains provide important benefits to both human communities and natural environments. When maintained in their natural state, floodplains:

- Slow the rate at which runoff enters streams, reducing peak flows and moderating flood impacts.
- Improve water quality by trapping sediment and filtering pollutants before they reach waterways.
- Recharge groundwater aquifers by allowing water to infiltrate into the soil.
- Provide habitat for a wide variety of plant and animal species, including sensitive and threatened species.

However, like elsewhere in California, floodplains in Napa County have been heavily affected by human development. Historically, they have been attractive locations for settlement due to proximity to water, fertile farmland, accessible transportation routes, and flat terrain suitable for building. Urbanization, agricultural expansion, and infrastructure construction can disrupt natural floodplain functions, altering drainage patterns, increasing downstream velocities, and reducing the capacity of channels to safely convey floodwaters. These changes can elevate flood risk both locally and downstream.

Responsible land use planning and floodplain management can allow human activity to coexist with floodplain ecosystems. Development within these areas must incorporate design measures that preserve or restore floodplain functions to the greatest extent feasible.

In Napa County, many areas that provide natural floodplain benefits are designated as wetlands, riparian corridors, open space, or protected lands under the county's General Plan and other regulatory measures. These areas are typically shielded from intensive development and, when development is proposed, must comply with the county's floodplain management regulations and the NFIP. Maintaining these lands in their current condition helps reduce future flood losses while supporting ecosystem health and resilience.

An analysis of areas providing natural floodplain functions in Napa County (Figure 3-8) illustrates that a substantial portion of the Napa River corridor—particularly in unincorporated areas—is already serving as active floodplain, including wetlands, federally managed lands, and vacant or undeveloped parcels. These areas, concentrated along the mainstem Napa River and its tributaries, play a critical role in attenuating flood flows by allowing water to spread across the landscape, thereby reducing peak discharges and downstream impacts. The map also highlights that many of these lands remain free of structural development, which preserves their ability to function as natural storage and conveyance areas during flood

events. However, it also underscores the spatial relationship between these functional floodplains and adjacent agricultural and rural lands, where encroachment or modification could diminish these benefits over time. Protecting and enhancing these identified areas represents a key opportunity for Napa County to maintain natural floodplain functions while minimizing long-term flood risk to unincorporated communities and infrastructure.

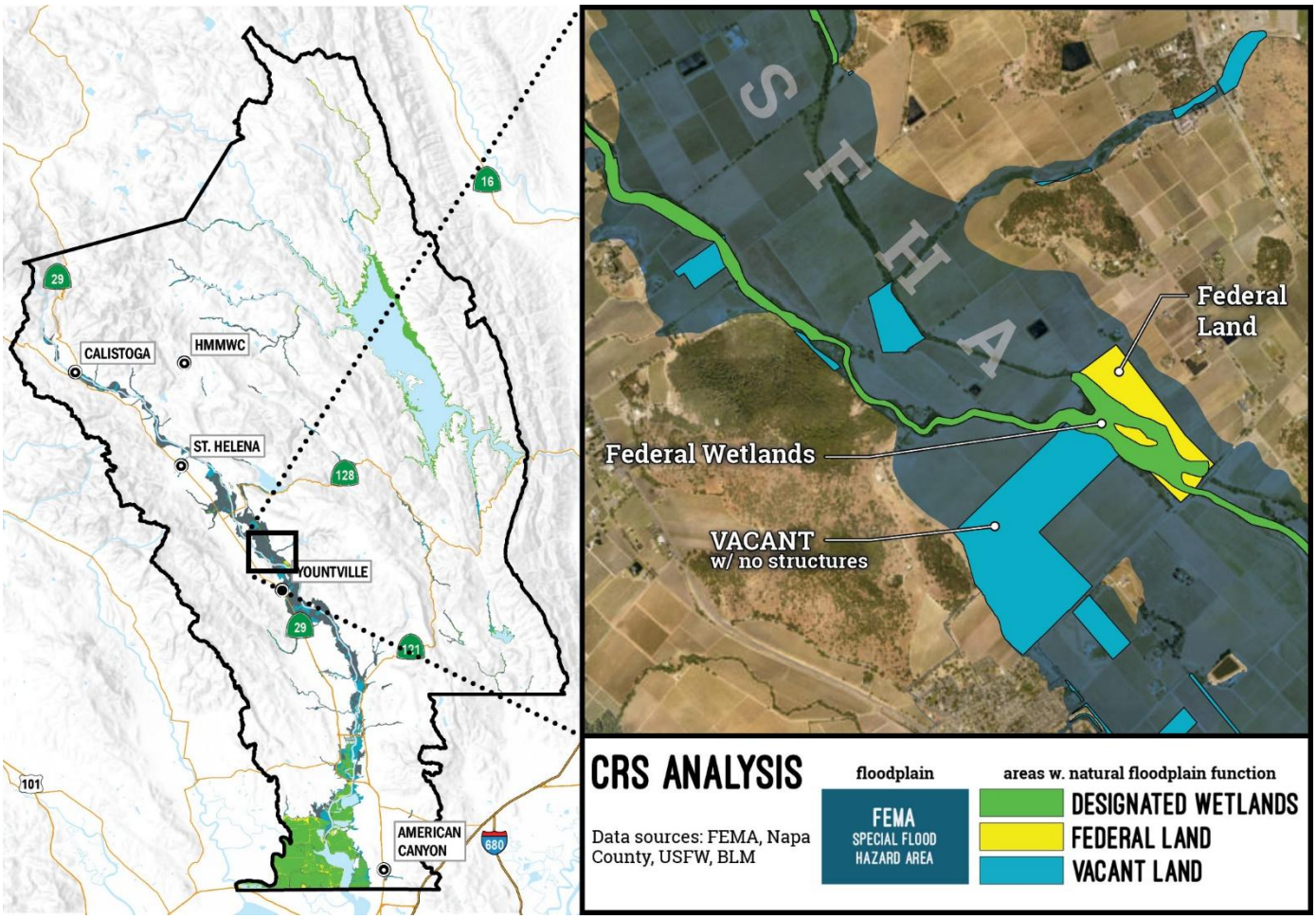


Figure 3-8: Areas Providing Natural Floodplain Functions in Napa County

3.3.2.1 Secondary & Compounding Hazards

Flooding in Napa County often triggers or contributes to other hazards that can significantly increase the overall impact of an event. One of the most persistent is bank erosion, which can, in some cases, cause more lasting damage than the initial flood. Erosion of riverbanks and stream channels can undermine infrastructure, damage private property, and alter flow patterns, increasing vulnerability to future floods. These secondary and compounding hazards are briefly discussed in this section in relation to flood; some are further discussed in other profiles, including wildfire burn scars (Section 3.3.1), heavy rain (Section 3.3.7), slope failure (Section 3.3.5), and climate change (Section 3.3.9).

Slope Failure

Flooding can lead to landslides, mudslides, debris flows, and other types of slope failure, particularly in steep mountain watersheds where saturated soils lose cohesion and fail. These secondary events can block roadways, isolate communities, and further disrupt drainage systems, sometimes creating temporary dams from accumulated debris that can release suddenly and worsen downstream flooding.

Wildfire Burn Scars

The presence of wildfire burn scars can significantly increase flood risk. Loss of vegetation and soil damage from the intense heat produced by severe wildfires reduces the land's ability to absorb rainfall, increasing both the speed and volume of runoff. The combination of rapid runoff and elevated sediment loads can cause severe erosion, degrade water quality, and increase slope failure hazards like debris flows in downstream communities.

Climate Change, Sea-Level Rise & Atmospheric Rivers

Climate change is expected to increase flood risk in Napa County by intensifying storm events, altering watershed response, and contributing to rising water levels in downstream tidal areas. While much of the County's flood-prone land remains undeveloped, particularly within the Napa River corridor, certain developed areas and critical infrastructure are increasingly exposed and should be incorporated into long-term planning efforts. Sea-level rise primarily affects the southern portion of the County near the Napa River estuary and San Pablo Bay, where higher base water levels can reduce drainage capacity and exacerbate riverine flooding during storm events. As illustrated in climate change profile in this d, exposure to sea-level rise is concentrated in low-lying areas near American Canyon and downstream of the City of Napa, with relatively limited impacts to the overall population but notable exposure to parcels, infrastructure, and key facilities.

Climate-driven changes are also expected to increase the frequency and intensity of atmospheric river events, which are a primary driver of major flooding in Napa County. These events can produce prolonged, high-intensity rainfall across the watershed, leading to rapid runoff and elevated flows along the Napa River and its tributaries. In unincorporated areas, where drainage infrastructure is less extensive and land use is more dispersed, these conditions can result in widespread overbank flooding, road overtopping, and isolation of rural communities. Additionally, sediment transport and channel capacity limitations may further exacerbate flood conditions over time.

Critical infrastructure located within low-lying and flood-prone areas—including transportation corridors, wastewater facilities, and utilities—may face increasing risk under combined storm and sea-level rise scenarios. Portions of the Napa River corridor, including areas near downtown Napa and extending south toward American Canyon, are particularly susceptible to these compounded hazards. These trends highlight the importance of incorporating climate-informed flood projections into hazard mitigation, land

use planning, and capital improvement strategies to reduce long-term vulnerability and enhance resilience throughout Napa County.

Hazardous Materials and Sewage Release

Hazardous materials and sewage releases are another secondary concern during a flood event. When floodwaters overtop or breach containment systems, above ground storage tanks, or other facilities storing chemicals, fuels, or other hazardous substances, contaminants or sewage can enter storm drains, streams, or the ocean. These releases create environmental hazards to people and natural ecosystems and further complicate cleanup and recovery efforts.

3.3.2.2 Subhazard: Levee Failure

Levee failure is a recognized subhazard associated with riverine flooding in Napa County, particularly along the Napa River corridor and in downstream areas influenced by tidal conditions near San Pablo Bay. Levees and flood control structures in Napa County are primarily non-federal systems designed to reduce flood risk by confining flows within constructed channels and protecting adjacent developed and agricultural lands. While these systems provide a level of protection, they do not eliminate flood risk, and failure can occur due to overtopping during extreme storm events, erosion of embankments, seepage through or beneath levees, or structural instability caused by prolonged saturation or poor foundation conditions.

In Napa County, levee and flood management infrastructure is most prominent along the Napa River and in the southern portion of the county, including areas near the City of Napa and American Canyon. These systems are part of a broader flood management approach that includes both structural improvements and restoration-based strategies implemented through the Napa County Flood Control and Water Conservation District. However, many levee segments are not designed to withstand extreme flood events beyond their intended level of protection, and some areas rely on a combination of levees, bypass channels, and natural floodplain function rather than continuous structural barriers.

Failure of levees in Napa County could result in rapid inundation of adjacent lands, particularly in low-lying unincorporated areas and agricultural zones where floodwaters can spread quickly across wide valley floors. Compared to gradual overbank flooding, levee breaches may produce higher velocities and deeper flooding with limited warning time, increasing the potential for damage to structures, disruption of transportation corridors, impacts to agricultural production, and risks to public safety. Areas downstream, where floodwaters interact with tidal influences, may experience prolonged inundation due to reduced drainage capacity.

Factors contributing to levee failure in Napa County include extreme precipitation events associated with atmospheric rivers, sediment accumulation that reduces channel capacity, deferred maintenance, vegetation or animal activity that weakens embankments, and seismic activity that can compromise structural integrity. Additionally, climate change may increase the likelihood of conditions that stress levee systems, including higher peak flows and coincident high tide conditions in downstream areas.

Mitigation strategies focus on continued inspection and maintenance of levee systems, targeted structural improvements, integration of nature-based flood management approaches, and emergency preparedness planning for areas located behind levees. Napa County's approach emphasizes a balance between structural protection and restoration of natural floodplain processes to reduce long-term risk and enhance system resilience.

3.3.2.3 Policies, Plans & Regulatory Environment

Federal Regulatory Environment

National Flood Insurance Program (NFIP)

The National Flood Insurance Program (NFIP) makes federally backed flood insurance available to homeowners, renters, and business owners in participating communities. In most participating communities, FEMA has prepared a detailed Flood Insurance Study (FIS). This study presents water surface elevations for floods of various magnitudes, including the 1% annual chance or base flood (also known as the 100-year flood) and the 0.2% annual chance flood (or 500-year flood).

Base Flood Elevations (BFE) and the boundaries of the 100- and 500-year floodplains are shown on Flood Insurance Rate Maps (FIRMs). These maps are the primary tools for identifying the extent and location of flood hazards. FIRMs also designate the regulatory floodway which is the channel of the river or stream and the adjacent land that must remain free from obstruction so that the base flood can be conveyed downstream. FIRMs represent the most detailed and consistent data source available and, in many communities, they define the minimum regulatory area for floodplain management.

The most recent county-wide FIRM for Napa County became effective on August 3rd 2016. This update produced a digital flood insurance rate map (DFIRM) that allows for easier integration with geographic information systems (GIS) and more precise identification of flood risk areas.

Communities that participate in the NFIP must, at a minimum, regulate development in flood hazard areas according to NFIP criteria. Before issuing a permit to build in a mapped floodplain, participating jurisdictions must ensure that:

- New buildings and substantially improved structures are elevated or otherwise protected to resist damage from the base flood.
- New floodplain development does not increase flood hazards or cause additional damage to other properties.
- Floodplain development incorporates reasonable and prudent measures to reduce impacts on natural floodplain functions and ecosystems, including threatened and endangered salmonid species.

Napa County entered the NFIP on February 1, 1980. Structures permitted or built before that date are classified as "pre-FIRM" and structures built afterward are "post FIRM." Post FIRM buildings generally qualify

for reduced flood insurance rates because they were constructed under floodplain management regulations intended to reduce flood damage. Pre-FIRM buildings are often more vulnerable to flooding because they were built before modern construction standards and land use regulations were adopted.

Community Rating System (CRS)

FEMA's Community Rating System (CRS) is a voluntary program within the NFIP that encourages floodplain management activities that exceed the minimum NFIP requirements. Flood insurance premiums are discounted to reflect the reduced flood risk resulting from community actions that meet the three goals of the CRS: 1) reduce flood losses, 2) facilitate accurate insurance rating, and 3) promote awareness of flood insurance.

For participating communities, flood insurance premium rates are discounted in increments of 5% according to the community's classification on a scale from ten to one. On this scale, a Class 1 community would receive a 45% premium discount, and a Class 9 community would receive a 5% discount. Class 10 communities are those that do not participate in the CRS and they receive no discount. The CRS classes for local communities are based on 18 creditable activities related to public information, mapping and regulations, flood damage reduction, and flood preparedness.

CRS activities can help to save lives and reduce property damage. Communities participating in the CRS represent a significant portion of the nation's flood risk; over 66% of the NFIP's policy base are communities in the CRS. Communities receiving premium discounts through the CRS range from small to large and represent a broad mixture of flood risks, including coastal and riverine.

Napa County NFIP & CRS Participation

Napa County and all five incorporated municipalities—Napa, American Canyon, St. Helena, Calistoga, and Yountville—participate in the NFIP. Each jurisdiction is currently in good standing with NFIP requirements. (Refer to the municipal annexes for jurisdiction-specific details). Compliance is monitored by FEMA Region 9 and by the California Department of Water Resources (DWR) under contract with FEMA. Maintaining NFIP compliance is a key element of the county's overall flood risk management strategy. All participating jurisdictions have identified ongoing initiatives to maintain their standing in the NFIP and to continue reducing flood risks.

The Planning Division within the County plays a central role in Napa County's flood hazard mitigation program. Its responsibilities include administering regulatory permitting for development in flood-prone areas, ensuring compliance with the NFIP, and managing participation in the CRS program. These functions help guide safe development, maintain eligibility for flood insurance, and provide residents with premium discounts through the CRS program. Together, these activities form a major component of the County's overall strategy to reduce long-term flood risk while supporting resilient growth.

Table 3-12 lists NFIP and CRS information for Napa County, which shows flood insurance claims paid since 1986.

Table 3-12: Napa County NFIP Status and Flood Insurance Statistics

Napa County NFIP Status and Flood Insurance Statistics	
NFIP Status	Participating Since 1980
Community Identification (CID)	060205
CRS Class (Entry Date)	Class 7 (May 2018)
Policies in Force (Total Coverage)	377 Policies ($109,741,000 in Coverage)
Policies Inside SFHA / Outside SFHA	287 Inside / 99 Outside
Policies in Coastal Zones (Total Coverage)	N/A
Total Claims (Total Paid)	383 Claims ($7,305,119 Paid)
Repetitive Loss (RL) / Severe Repetitive Loss (SRL) Properties	33 RL /6 SRL (unmitigated insured)
Repetitive Loss Payments	$2,578,028 for Buildings / $718,251 for Contents

Note: The number of policies is by property and does not count policies for individual buildings. The Privacy Act of 1974 (5 USC 522a) restricts the release of certain types of data to the public. Flood insurance policy and claims data is included in the list of restricted information. FEMA can only release such data to state and local governments, and only if the data is used for floodplain management, mitigation, or research purposes. Therefore, this plan does not identify the repetitive loss properties or include claims data for any individual property.

U.S. Army Corps of Engineers (USACE)

The U.S. Army Corps of Engineers (USACE) plays a key role in flood risk management in Napa County through planning, engineering, and implementation of large-scale, multi-benefit flood control projects in partnership with local sponsors, most notably the Napa County Flood Control and Water Conservation District. USACE's involvement in Napa County has focused primarily on the Napa River Flood Risk Management Project, a congressionally authorized effort that integrates flood protection, ecosystem restoration, and community enhancement. This project includes a combination of levees, floodwalls, bypass channels, and restored floodplain areas designed to reduce flood risk while maintaining and enhancing natural river functions.

Key USACE responsibilities and activities in Napa County include:

- **Napa River Flood Risk Management Project:** USACE, in partnership with local agencies, has supported the design and implementation of improvements along the Napa River through the City of Napa and downstream areas. The project emphasizes a "living river" approach, combining structural flood protection measures with restored wetlands and floodplain expansion to provide flood risk reduction while improving habitat and water quality.

- **Technical Assistance:** USACE provides hydrologic and hydraulic modeling, sediment transport analysis, and engineering support for flood management and watershed planning efforts. These services are delivered through programs such as Floodplain Management Services (FPMS) and Planning Assistance to States (PAS), helping local agencies evaluate flood risk and develop mitigation strategies.

- **Ecosystem Restoration:** In Napa County, USACE has supported projects that integrate habitat restoration with flood risk reduction, particularly along the Napa River and in downstream tidal areas. These efforts enhance riparian corridors, wetlands, and estuarine systems while also improving flood storage capacity and system resilience.

- **Emergency Operations:** During major flood events, USACE may provide technical and operational support to local jurisdictions, including flood fight assistance and post-event recovery support for flood control infrastructure. This includes coordination with local agencies to assess damages and implement emergency measures to reduce immediate risks.

USACE activities in Napa County are carried out through formal partnerships with local sponsors and typically involve shared funding responsibilities among federal, state, and local agencies. These efforts complement ongoing work by regional and local entities and support an integrated, watershed-based approach to flood risk reduction.

State Regulatory Environment

California Department of Water Resources (DWR)

The California Department of Water Resources (DWR) serves as the lead state agency for water management and flood risk reduction and plays an important supporting role in Napa County through planning, technical assistance, data development, and funding. While DWR does not directly operate local flood control infrastructure in Napa County, it works closely with the Napa County Flood Control and Water Conservation District and other regional partners to advance both structural and non-structural flood mitigation efforts. DWR's responsibilities and activities in Napa County include:

- **Floodplain Mapping and Data:** DWR collaborates with FEMA and local agencies to support the development and refinement of flood hazard mapping, including provision of hydrologic and hydraulic data used in Flood Insurance Studies and risk assessments. DWR's Best Available Mapping (BAM) and related datasets help identify areas vulnerable to flooding beyond mapped regulatory floodplains, supporting local planning, capital improvement decisions, and hazard mitigation efforts throughout the Napa River watershed.

- **Flood Forecasting and Operations Support:** During major storm events, DWR operates the Flood Operations Center (FOC), which provides real-time hydrologic data, precipitation forecasts, and watershed conditions. This information supports local emergency response, reservoir operations (including Lake Berryessa releases), and coordination with flood control agencies in Napa County.

- **Technical Assistance:** DWR provides engineering, hydrologic modeling, and watershed planning support to local agencies. In Napa County, this includes assistance with evaluating flood risk along the Napa River and its tributaries, sediment management considerations, and integration of climate-informed data into local planning efforts.

- **Grant Funding:** DWR administers multiple grant programs that support flood risk reduction projects in Napa County, including planning, design, and construction activities. These programs fund multi-benefit projects such as floodplain restoration, channel improvements, stormwater management, and resilience planning, particularly in areas vulnerable to riverine and downstream tidal flooding.

- **Climate Adaptation and Resilience:** DWR supports local agencies in Napa County through climate science, guidance, and funding focused on changing hydrologic conditions, including more intense storm events and sea-level rise impacts in southern portions of the county. These efforts promote integrated watershed management approaches that combine flood risk reduction with ecosystem restoration.

Through these activities, DWR serves as a key partner to Napa County and its jurisdictions, helping to advance a coordinated, watershed-based approach to flood management that aligns state resources with local priorities.

Local Regulatory Environment

Napa County Flood Control & Water Conservation District

The Napa County Flood Control and Water Conservation District (NCFCWCD) was established by the California State Legislature in 1951. Napa County supported District formation to create a separate government entity responsible for developing and managing domestic water supplies and managing flood and storm waters in Napa County. The District participates in government programs and joint-use activities to augment and enhance local water supplies and obtain federal and state assistance to finance flood risk management projects.

Since its formation, NCFCWCD has developed two principal and distinct service activities: water conservation and flood control. The District's water conservation services primarily involve administering contracts with the State of California and the United States Bureau of Reclamation for annual water supply entitlements from the State Water Project and the Solano Project, respectively. As part of its administrative duties, the District subcontracts its imported water supply entitlements to cities and special districts throughout Napa County.

The District's flood management services focus on managing and coordinating projects intended to protect local communities from inundation by maintaining and clearing tributary channels and sponsoring capital improvements. This includes implementing the voter-approved "Napa River/Napa Creek Flood Protection Project," which includes projects to protect the City of Napa from a 100-year flood.

Prior to NCFCWCD's formation, organized flood control activities in Napa County were primarily the responsibilities of local jurisdictions. However, in 1938, the United States Congress passed legislation authorizing and funding the Army Corps of Engineers (USACE) to study flood-hazard waterways throughout the nation for the purpose of developing and implementing protection plans. The Napa River, on record as having severely flooded more than a dozen times, was among the subjects studied. (County, 2016)

Napa County Floodplain Management Regulations

Napa County has participated in the NFIP since 1980 and has adopted the most recent FIRMs and FIS issued by FEMA (dated August 3rd 2016) as well as local floodplain development regulations in compliance with the minimum NFIP standards (Chapter 16.04 of the County Code). These minimum standards include procedures and provisions for substantial improvements and substantial damages to existing structures, the latter of which are employed by the floodplain administrator and county building inspectors following any hazard event affecting structures located in the flood hazard area in accordance with NFIP requirements. Regulations for substantial or cumulative improvements are enforced via permitting procedures. By code, implementation and enforcement of the County's floodplain regulations are assigned to the county Director of Planning, Building and Environmental Services or their designee.

The provisions of Chapter 16.04 are intended to promote public health, safety, and welfare, and to minimize public and private losses due to flood conditions. The regulations restrict land uses that could increase erosion, obstruct flood flows, or exacerbate flooding; require that new construction and substantial and cumulative improvements over a 5-year period be protected against flood damage at the time of initial construction; limit the alteration of natural floodplains, stream channels, and protective barriers; and avoid development practices that could unnaturally divert floodwaters or increase flood hazards in other areas. County Code Title 18 (Zoning Regulations) provides additional protections for riparian corridors to maintain their natural flood and erosion control functions.

The Napa County Code addresses flooding through regulation of land use activities (§ 16.04). Regulations include prohibiting land uses that could result in increases erosion and flooding; requiring flood protection at initial construction; limiting the alternation of natural floodplains and stream channels during construction; and avoiding constructing barriers that could unnaturally divert floodwaters or increase flood hazards. The regulations also include development restrictions for the protection of riparian areas.

Napa County Code outlines requirements for drainage and flood control facilities and flood control protection for new development, based on the size of development. Drainage facilities should be designed to capture projected runoff from a storm with a frequency of one in one hundred years, and must be approved by the County before installation. Similar requirements are in place for improvement plans for flood control facilities.

Napa County General Plan

The Napa County General Plan Safety Element (August 2023 Update) establishes a comprehensive policy framework to reduce flood risk through land use regulation, infrastructure improvements, and hazard mitigation strategies, consistent with California Government Code §65302(g) requirements for flood hazard planning.

Goal SAF-6: Protect life, property, and environmental resources from flood hazards through integrated planning, regulatory standards, and capital improvements. *(Goal context derived from Flooding section, SAF-32–34)* Key supporting policies include:

- **Policy SAF-6.2:** Maintain flood-prone areas in agricultural or open space uses to reduce exposure of structures and preserve natural floodplain functions.
- **Policy SAF-6.3:** Require review of development within mapped floodways using FEMA Flood Insurance Rate Maps (FIRMs), ensuring compliance with the County's FEMA-approved Floodplain Management Ordinance and maintaining flood protection performance (e.g., Napa River freeboard).
- **Policy SAF-6.4:** Evaluate development proposals using dam failure inundation maps to inform siting decisions and evacuation planning.
- **Policy SAF-6.5:** Support dam and levee safety by coordinating with responsible agencies and operators to ensure proper maintenance and risk reduction.
- **Policy SAF-6.15:** Adopt enhanced regulatory standards consistent with a no-adverse-impact floodplain management approach, reducing future flood risk and cumulative impacts.
- **Policy SAF-6.16:** Require elevation of new or substantially improved structures above the 100-year flood level to provide a margin of safety, including consideration of extreme weather and sea level rise.
- **Policy SAF-6.17:** Ensure updated FEMA floodplain mapping reflects future conditions, including climate change and sea level rise, to guide development and land use decisions.

Additional policies support structural and programmatic mitigation actions, including:

- Stormwater and drainage improvements (Policy SAF-6.14);
- Bridge and culvert retrofits for 100-year flows (Policy SAF-6.13);
- Flood risk reduction in unprotected areas and NFIP participation outreach (Policies SAF-6.6 and SAF-6.7); and
- Watershed and channel management measures (Policies SAF-6.8–6.12).

3.3.2.4 Past Events

Flooding in Napa County is a recurring hazard driven primarily by prolonged, high-intensity winter storm events affecting the Napa River watershed. As documented in the FEMA Flood Insurance Study, flood-producing streamflow typically results from rainfall events lasting more than 12 hours, most commonly during the winter months, and the Napa Valley floor has historically experienced frequent inundation along the Napa River and its tributaries . Historical records indicate repeated major flood events dating back to the 19th century, with continued damages throughout the 20th century, culminating in the February 1986 flood, which caused approximately $100 million in damages and widespread impacts to residences and infrastructure. More recent federally declared disasters, summarized in Table 3-13, demonstrate that flooding remains a persistent and significant hazard, with multiple declarations in 1995, 1997, 1998, 2006, 2017, 2019, and 2023 associated with severe winter storms, flooding, landslides, and mudslides.

Supplementing these federal disaster records, the NOAA Storm Events Database provides detailed, event-level documentation of flooding impacts across Napa County, as summarized in Table 3-14. These data indicate that flooding is most frequently associated with atmospheric river systems, which deliver intense rainfall, saturate soils, and produce a combination of riverine flooding, urban flooding, debris flows, and

landslides. For example, a series of atmospheric river events in 2017 caused widespread flooding across the Napa River watershed, with stream gauges exceeding flood stage and numerous roadway closures in both incorporated and unincorporated areas. Similarly, multiple atmospheric river events in February 2019 produced over 10 inches of rainfall in some locations, resulting in widespread roadway flooding, debris flows, and hazardous conditions, including vehicles being swept from flooded roadways.

NOAA records further highlight the frequency of localized but impactful flood incidents that may not rise to the level of federal disaster declarations but still result in significant disruptions. These include roadway washouts, such as the failure of Big Ranch Road during the February 2025 atmospheric river event; landslides and rockfalls along key transportation corridors such as State Route 29; and repeated flooding along rural roads including Deer Park Road, Silverado Trail, and Pope Valley areas. In addition, coastal and tidal influences contribute to flood risk in southern portions of the county, where King Tide events in 2020 and 2022 caused minor but recurring flooding along the San Francisco Bay shoreline.

Recent events from 2024 and 2025 demonstrate that these patterns are ongoing, with successive winter storms and atmospheric rivers producing heavy rainfall, localized flooding, and debris-related impacts, particularly in steep, unincorporated areas where drainage infrastructure is limited. Notably, a November 2024 atmospheric river delivered extreme rainfall totals, approaching one foot in valley areas and significantly higher in upland regions, triggering landslides that blocked major routes. Additional storm sequences in December 2024 and December 2025 caused travel disruptions, roadway flooding, and debris deposition during peak holiday periods.

Together, the FEMA disaster data and NOAA event records illustrate that flooding in Napa County occurs across a spectrum of scales—from large, federally declared disasters impacting the entire watershed to frequent, localized events affecting transportation networks and rural communities. These datasets collectively demonstrate that flood hazards in Napa County are closely tied to atmospheric river activity, saturated watershed conditions, and the geomorphic characteristics of the Napa River basin. The combined evidence underscores the need for comprehensive mitigation strategies that address both large-scale flood events and the cumulative impacts of smaller, recurring incidents, particularly in vulnerable unincorporated areas.

Table 3-13: Napa County FEMA Declared Flood Disasters Since 1995

Year	Month / Day	Incident Description	Disaster No.
2023	2-Apr	Severe Winter Storms, Straight-Line Winds, Flooding, Landslides, & Mudslides	DR-4699-CA
2023	9-Mar	Severe Winter Storms, Flooding, Landslides, & Mudslides	EM-3592-CA
2023	13-Jan	Severe Winter Storms, Flooding, Landslides, & Mudslides	DR-4683-CA
2023	8-Jan	Severe Winter Storms, Flooding, & Mudslides	EM-3591-CA
2019	05/01; 05/17	Severe Storm, Winter Storm, Mud & Landslides, Flooding	DM-4431/4434
2017	2/14; 3/16; 04/01	Severe Storm, Winter Storm, Mud & Landslides, Flooding	DM-4301/4305/4308
2006	29-Mar	Severe Storm, Winter Storm, Mud & Landslides, Flooding	DR-1646
2006	17-Dec	Severe Storm, Winter Storm, Mud & Landslides, Flooding	DR-1628

Year	Month / Day	Incident Description	Disaster No.
1998	2-Feb	Severe Storms, Flooding	DR-1203
1997	16-Feb	Severe Storms, Flooding, Mud & Landslides	DR-1155
1995	3-Jan	Severe Storm, Winter Storm, Mud & Landslides, Flooding	DR-1044
1995	13-Feb	Severe Storm, Winter Storm, Mud & Landslides, Flooding	DR-1046

Source: FEMA Disaster Database

Table 3-14: Napa County NOAA Recorded Flood Events Since 1995

Date	Event Type	Consolidated NOAA Narrative
12/22/2025	Flood	A series of winter storm systems from December 19–25 produced heavy rainfall, roadway impacts, and widespread disruptions across the region, including boulders blocking Highway 121 near Wild Horse Valley Road. The storms significantly affected holiday travel, caused major flight delays, and resulted in widespread power outages.
2/3–2/4/2025	Flood	An intense atmospheric river brought heavy rain and strong winds to Napa County, causing roadway flooding, washouts (Big Ranch Road), and rockslides along State Route 29, with broader regional flooding including the Russian River.
12/29/2024	Flood	Multiple storm systems between December 26–29 generated localized flooding, gusty winds, and debris movement, including rocks obstructing Deer Park Road.
11/22/2024	Flood	A powerful atmospheric river with rapid cyclogenesis delivered extreme rainfall (up to ~1 foot in valleys), triggering significant landslides and roadway blockages along State Route 29 and surrounding areas.
1/31/2024	Flood	A fast-moving cold front and narrow cold frontal rainband produced intense rainfall and high winds, resulting in roadway flooding along State Route 221 and Route 29.
7/11–7/13/2022	Coastal Flood	Exceptionally high astronomical tides (King Tides) caused minor coastal and bay shoreline flooding, resulting in roadway closures and localized inundation over multiple days.
11/15/2020	Coastal Flood	King Tides combined with rough seas produced minor coastal flooding and hazardous ocean conditions, including roadway inundation and dangerous surf.
Feb 2019 (multiple dates)	Flood	A series of atmospheric rivers delivered extreme rainfall (over 20 inches in some areas), resulting in widespread flooding, roadway inundation, debris flows, and hazardous conditions including vehicles swept from roadways. Strong winds and regional river flooding compounded impacts.
2/12–2/15/2019	Flood	A strong atmospheric river and cold front produced heavy rainfall (up to 10 inches), widespread flooding, debris flows, and dangerous roadway conditions, along with high winds causing downed trees, infrastructure damage, and fatalities regionally.
1/2019 (multiple events)	Flood	Multiple winter storms and atmospheric rivers caused repeated roadway flooding, debris flows, and high wind impacts, including flooding along Silverado Trail and Deer Park Road, with some events producing tornadoes and fatalities elsewhere in the region.
11/29/2018	Flood	A low-pressure system produced heavy rain, thunderstorms, and gusty winds, resulting in roadway flooding, debris flows, and downed trees in Napa County.
Feb 2017 (multiple events)	Flood / Flash Flood	A sequence of atmospheric river events saturated soils and produced widespread flooding, stream exceedances (Napa River and Milliken Creek), roadway inundation, and debris flows throughout the county.
12/15/2016	Flood	A slow-moving winter storm produced prolonged moderate to heavy rainfall, causing widespread roadway flooding and wind-related damage across Napa County.

2/2015	Flood / Heavy Rain	A strong winter storm ended a prolonged dry period, producing heavy rainfall (5–10 inches in higher elevations), localized flooding, debris flows, and wind damage.
12/11/2014	Flood	A high-intensity atmospheric river with a narrow cold frontal rainband produced extreme short-duration rainfall rates (up to 2 inches/hour), causing widespread urban flooding, debris flows, and storm-related impacts.
12/23/2012	Flood	A series of atmospheric river storms during late December caused widespread flooding, including Hopper Creek overflow, roadway inundation, and disruptions to transportation such as rail service.
11/30/2012	Flood / Heavy Rain	Multiple winter storms produced heavy rainfall, urban and small stream flooding, and power outages across Napa County.
12/2002	Flood / Flash Flood	One of the wettest Decembers on record produced prolonged rainfall, resulting in mainstem flooding along the Napa River (exceeding flood stage), widespread urban flooding, and saturated soil conditions increasing landslide risk.
12/31/2005–1/1/2006	Flood	Severe flooding occurred as the Napa River exceeded flood stage, inundating downtown Napa and surrounding areas, damaging hundreds of homes and businesses, and causing significant economic losses.
1997–1998	Flood / Flash Flood	Intense rainfall events caused rapid rises in the Napa River and tributaries, exceeding flood stage and producing widespread flooding and infrastructure impacts, including levee-related failures in the region.

Source: NOAA Event Database (1995 – 2025)

3.3.2.5 Location

Flooding in Napa County is concentrated along a north-to-south corridor following the Napa River, with the highest flood exposure occurring in the central and southern portions of the county where the river widens and topography flattens. As illustrated in Figure 3-9, mapped flood hazard areas are primarily located along the Napa River mainstem and its associated floodplain, extending from the upper valley near Calistoga through St. Helena and Yountville, and becoming more expansive downstream of the City of Napa toward American Canyon. In these southern reaches, floodplains broaden significantly and are further influenced by tidal conditions from San Pablo Bay, increasing both the extent and duration of inundation.

While the Napa River serves as the primary drainage system, flood risk is also distributed across a network of tributary creeks that contribute substantial runoff during storm events. On the west side of the watershed, creeks such as Sulphur Creek, Dry Creek, Hopper Creek, Redwood Creek, Napa Creek, and Browns Valley Creek drain steep upland areas and convey flows through developed portions of the valley floor, often resulting in localized flooding where channel capacity is limited or crossings are constrained. On the east side, tributaries including Conn Creek, Rector Creek, and Milliken Creek exhibit similar behavior, with rapid runoff from higher elevations contributing to downstream flood conditions. Many of these tributaries intersect rural roadways and developed parcels in unincorporated areas, where infrastructure limitations and proximity to channels increase vulnerability.

The map also indicates that a substantial portion of the floodplain, particularly in the central and southern valley, overlaps with agricultural lands and open space, although developed areas and critical infrastructure

are present within or adjacent to these zones. Flood risk is therefore not limited to the main river channel but extends across interconnected floodplain and tributary systems throughout the watershed. These patterns highlight that, despite improvements associated with the Napa River Flood Protection Project, residual flood risk persists, particularly along tributary corridors and in low-lying areas where floodwaters can spread beyond defined channels.

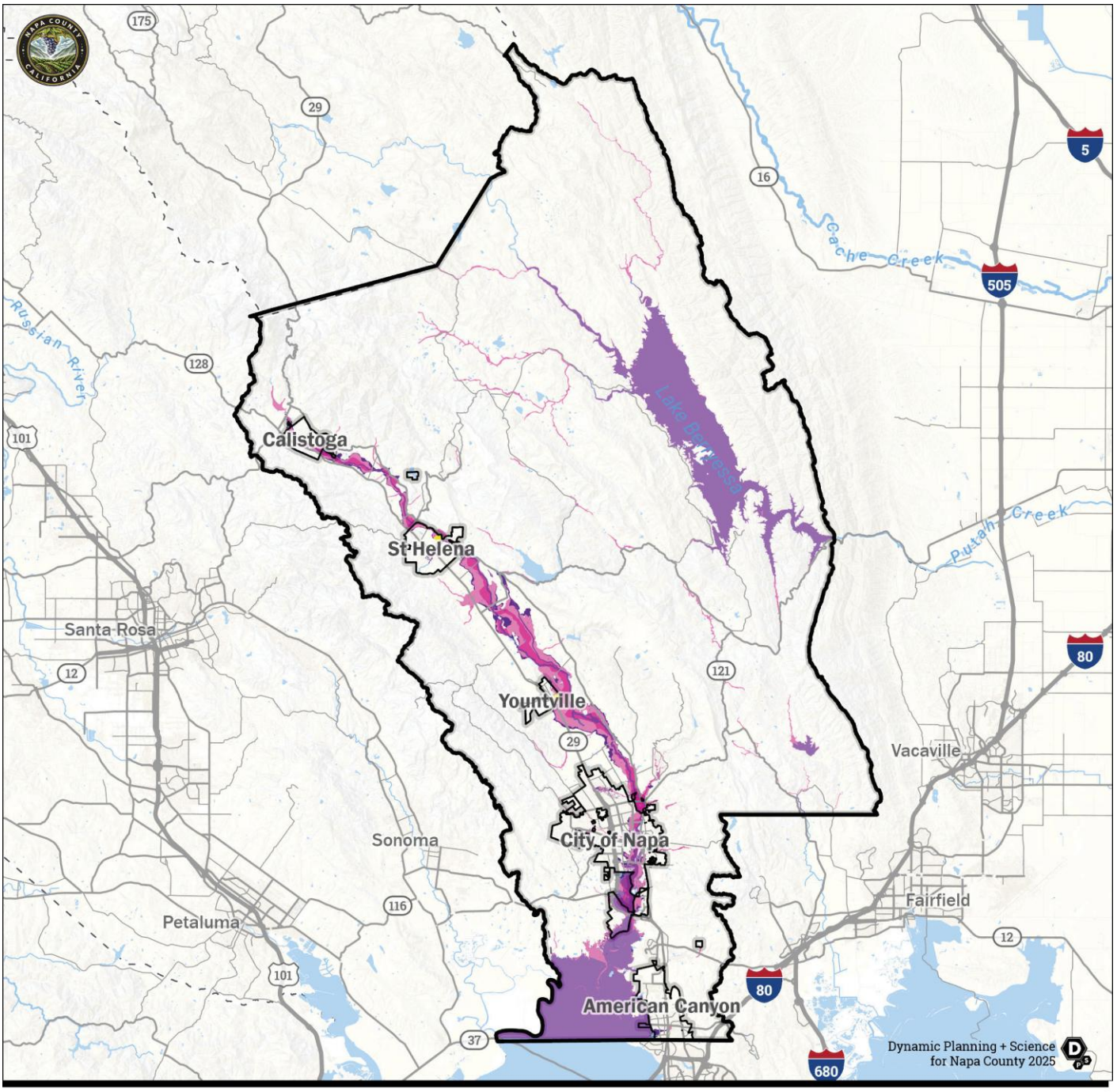
Flood Awareness Zones

In addition to FEMA-designated Special Flood Hazard Areas, the California Department of Water Resources (DWR) Best Available Mapping (BAM) program identifies Flood Awareness Zones that represent areas of potential flood risk not fully captured in detailed FEMA studies. These zones, shown in Figure 3-10 and Figure 3-11 highlight smaller tributaries, upper watershed channels, and localized drainage areas where flooding has been observed or is anticipated under larger storm events, including the 200-year flood. In Napa County, these mapped areas are primarily concentrated in unincorporated, upland, and transitional valley areas where hydrologic response is rapid and drainage infrastructure is limited.

As illustrated in Figure 3-10 (Dry Creek and Surrounding Area), Flood Awareness Zones are prevalent in the northern Napa Valley and Calistoga area, including Dry Creek, York Creek, Cyrus Creek, and Blossom Creek, as well as tributaries to Garnett Creek. These systems drain steep terrain and convey flows into the upper Napa River, where narrow channels and confined valleys can produce localized flooding, roadway overtopping, and debris-related impacts during intense rainfall. Additional mapped areas include small tributaries of Pope Creek and drainage networks within Elder Valley, Soda Valley, and Soda Canyon, where topography and watershed characteristics contribute to rapid runoff and increased flood potential.

Further south, Figure 3-11 (South Napa 200-Year Awareness Zones) shows expanded Flood Awareness Zones in lower elevation areas near the Napa River and San Pablo Bay, including Carneros Creek and other tributaries draining toward tidal floodplains. In these areas, flood risk may be influenced by a combination of upstream runoff, flat topography, and backwater effects from tidal conditions, resulting in prolonged inundation and limited drainage capacity.

Although these BAM-identified areas are not regulated as FEMA floodplains, they indicate locations where flooding can occur outside mapped Special Flood Hazard Areas, particularly during extreme storm events such as atmospheric rivers. These zones are especially relevant in unincorporated Napa County, where development patterns, rural road networks, and proximity to creeks increase exposure. The identification of Flood Awareness Zones underscores the importance of incorporating watershed-scale planning, maintaining natural drainage systems, and carefully managing land use in headwater and tributary areas to reduce both localized and downstream flood risks.



FEMA Flood Risk Exposure

Unincorporated County

*Data sources: FEMA.

100YR
FLOODWAY
LEVEE
500YR

Figure 3-9: Napa County FEMA Flood Risk Exposure Map

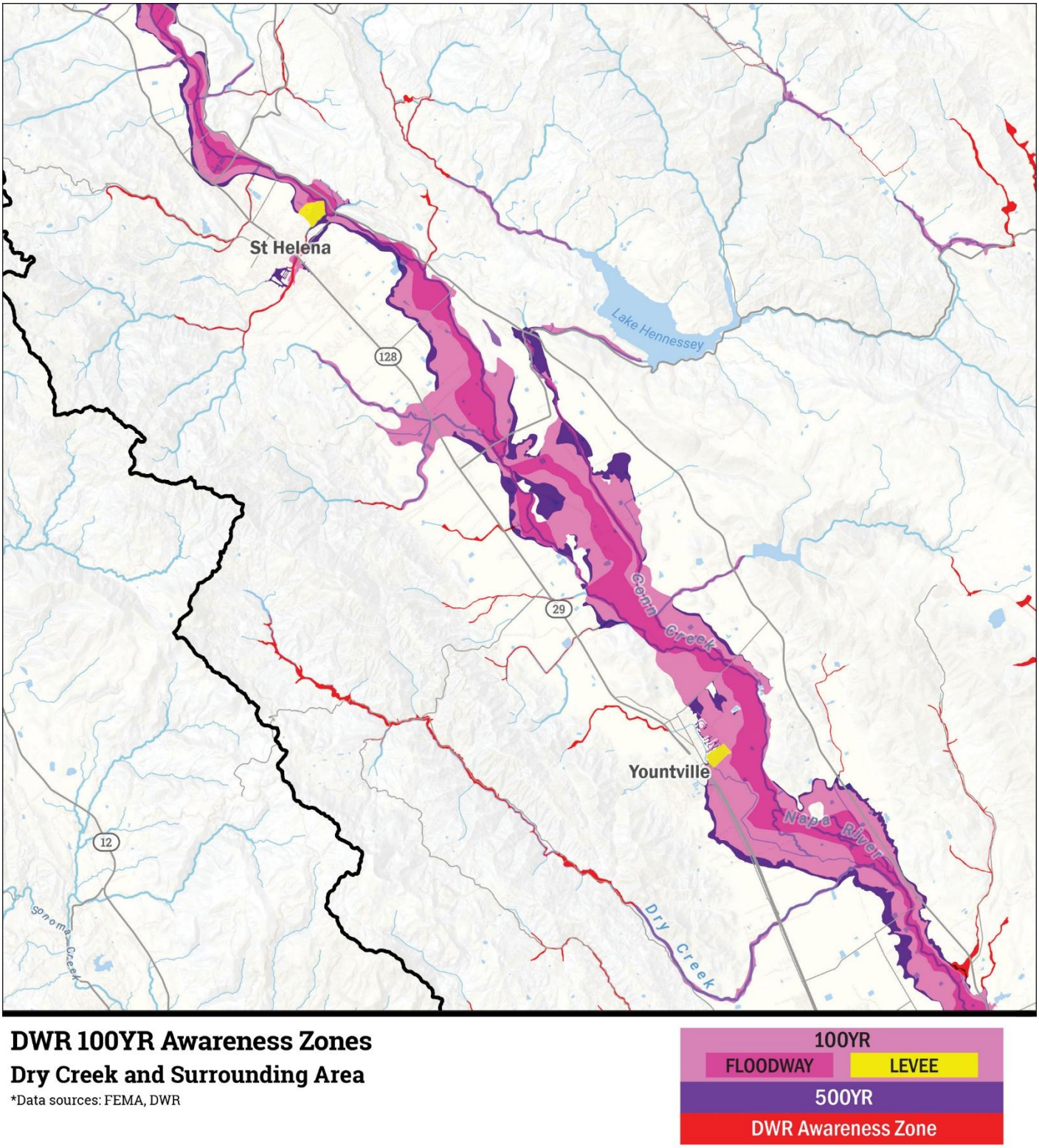


Figure 3-10: DWR Awareness Zones (Dry Creek and Surrounding Area)

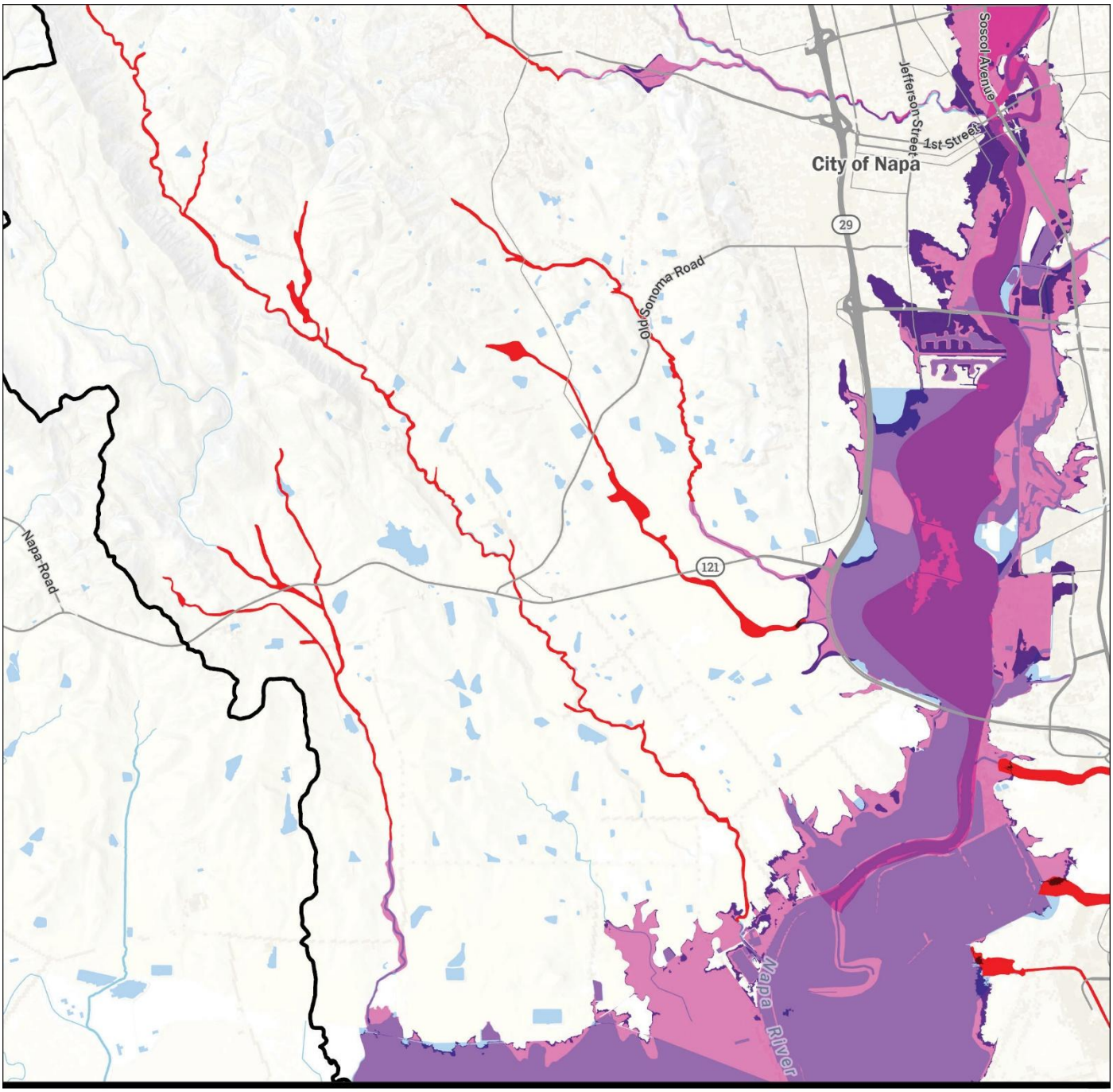


Figure 3-11: DWR 200-YR Awareness Zones (South Napa)

Levee Systems

Levee systems in Napa County differ substantially from traditional urban flood control systems, with the majority of levees located in the southern portion of the county serving agricultural, wetland, and reclamation functions rather than providing engineered flood protection to developed areas. As shown in Figure 3-12, an extensive network of levees is concentrated around the Napa River estuary, lower Napa River corridor, and the Napa-Sonoma Marshes Wildlife Area. These levees were historically constructed to support agriculture, salt pond operations, and land reclamation, and today many function to manage water levels in wetlands, protect habitat restoration areas, and maintain access to low-lying lands. As a result, these systems generally do not provide a consistent or engineered level of flood protection and may be overtopped during high river flows, storm surge, or elevated tidal conditions.

In contrast, there are a limited number of levee and flood management structures along the Napa River system designed to reduce flood risk to developed areas, particularly in and around the City of Napa and adjacent unincorporated communities. These include features associated with the Napa River Flood Protection Project, which incorporates a combination of levees, floodwalls, bypass channels, and restored floodplain areas to manage flood flows through the central Napa River corridor. While these improvements have significantly reduced the risk of catastrophic flooding in developed areas, they do not eliminate flood risk, particularly during extreme storm events that exceed design capacity or when tributary flooding occurs outside of the protected system.

Levees in southern Napa County, particularly those protecting low-lying areas near the bay and along corridors such as Milton Road, are often subject to additional stressors including tidal influence, sea level rise, subsidence, and limited maintenance resources. These conditions can increase the likelihood of overtopping, erosion, or structural degradation over time. Failure or overtopping of these levees can result in rapid inundation of adjacent lands, including agricultural areas, rural residences, transportation routes, and ecological preserves.

Overall, Napa County's levee systems present a complex risk profile: while some structures provide targeted flood risk reduction in developed areas, much of the levee network in the southern county functions primarily for water management and habitat purposes and should not be relied upon for flood protection. As illustrated in Figure 3-12, areas behind these levees remain vulnerable to flooding, particularly under combined riverine and tidal conditions, underscoring the importance of continued monitoring, maintenance, and integration of levee performance into broader flood risk management and land use planning efforts.

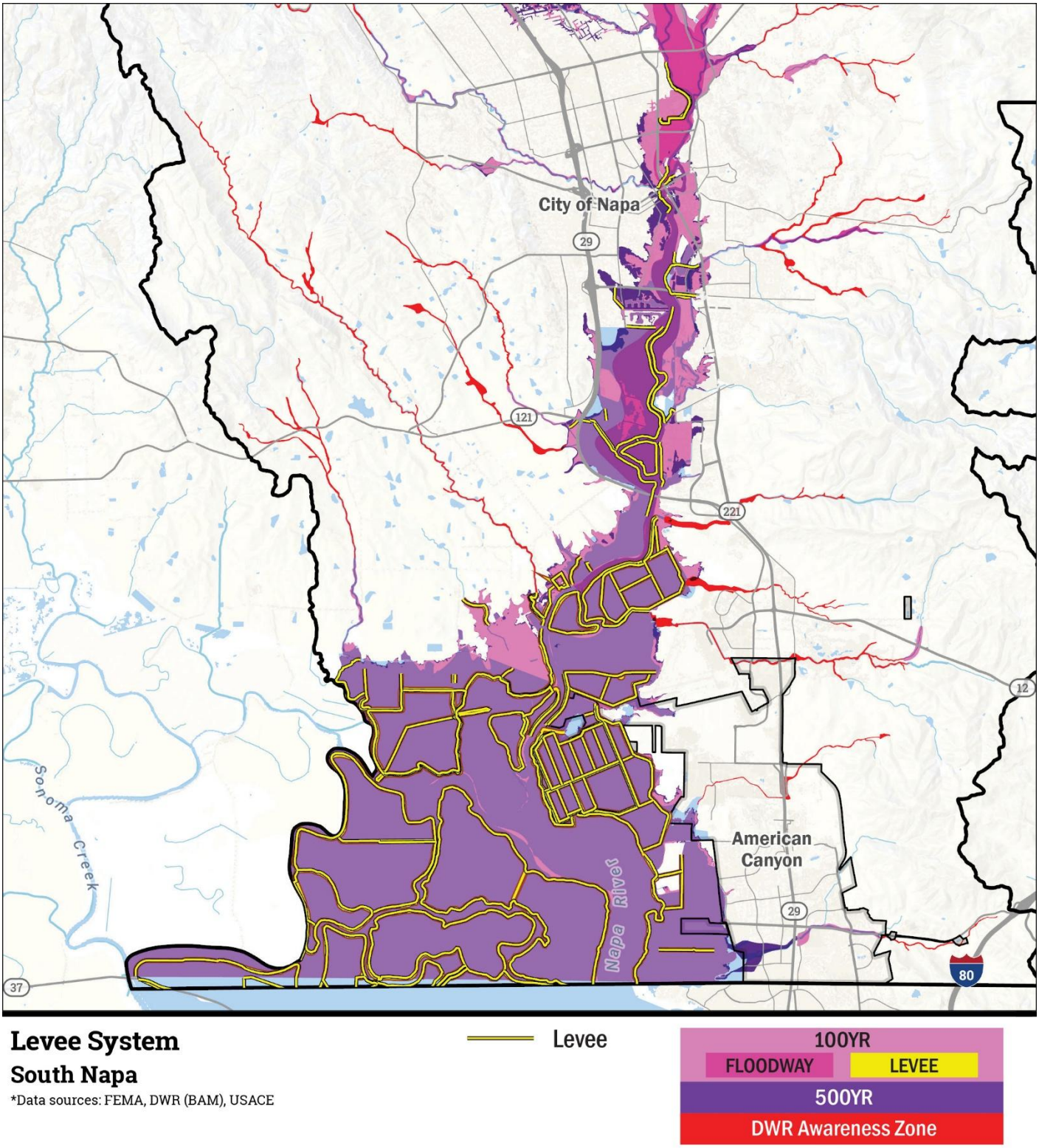


Figure 3-12: Southern Napa County Levee System

3.3.2.5.1 Repetitive Loss (RL)

A repetitive loss (RL) property is a FEMA designation, defined as an insured property that has made two or more claims of more than $1,000 in any rolling 10-year period since 1978. The term "rolling 10-year period" means that both qualifying claims happen within 10 years of each other. For example, a property would be designated as RL if there was a claim of $1,500 in January 2006 and another claim for $2,000 in December 2015, but not if the second claim occurred after January 2016. Claims must be at least 10 days apart but within 10 years of each other.

RL properties may be classified as Severe Repetitive Loss under certain conditions. A Severe Repetitive Loss property (SRL) has had four or more claims of at least $5,000, or at least two claims that cumulatively exceed the buildings reported value. A property that sustains repetitive flooding may or may not be on Napa County's RL property list for a number of reasons:

- Owners who have completed the terms of the mortgage or who purchased their property outright may not choose to carry flood insurance and instead bear the costs of recovery on their own.
- The owner of a flooded property that does carry flood insurance may choose not to file a claim.
- Even insured properties that are flooded regularly with filed claims may not meet the $1,000 minimum threshold to be recognized as an RL property.
- The owner adopted mitigation measures that reduce the impact of flooding on the structure, removing it from the RL threat and the RL list (in accordance with FEMA's mitigation reporting requirements).

A property does not have to be currently carrying a flood insurance policy to be considered a RL or SRL property. Often homes in communities are not carrying flood insurance but are still on the community's RL list. The RL designation follows a property from owner to owner, from insurance policy to no insurance policy, and even after the property has been mitigated. Having an insurance policy and making claims that fall into the repetitive loss criteria will put a property on the RL list. Even after the policy on a property has lapsed or been terminated, the property will remain on the county's RL list.

Extensive FEMA NFIP databases are used to track claims for every participating community, including unincorporated Napa County. Currently, unincorporated portions of Napa County contain 39 RL properties under their jurisdictional umbrella. Of the 39 properties, 6 are SRL properties. The total dollar amount of claims paid to date by the NFIP for RL properties is $2,578,028 of structural and $718,251 content claims. Together, the total claims paid by the NFIP are $3,296,280 for the unincorporated areas of the County.

Since 2010, Napa County has successfully mitigated several RL/SRL properties, primarily through elevation and relocation to reduce exposure in certain repetitive loss areas (RLA). However, **39[4] properties remain unmitigated and insured** under the NFIP which continue to generate claims during significant flood events. Addressing these remaining properties through cost-effective mitigation measures remains a priority in the county's flood risk reduction strategy. Loss statistics under the NFIP are presented in Table 3-12.

[4] ** According to FEMA data, 4 RL properties assigned to local participating jurisdictions are in the unincorporated County.*

3.3.2.5.2 Repetitive Loss Areas Analysis (RLAA)

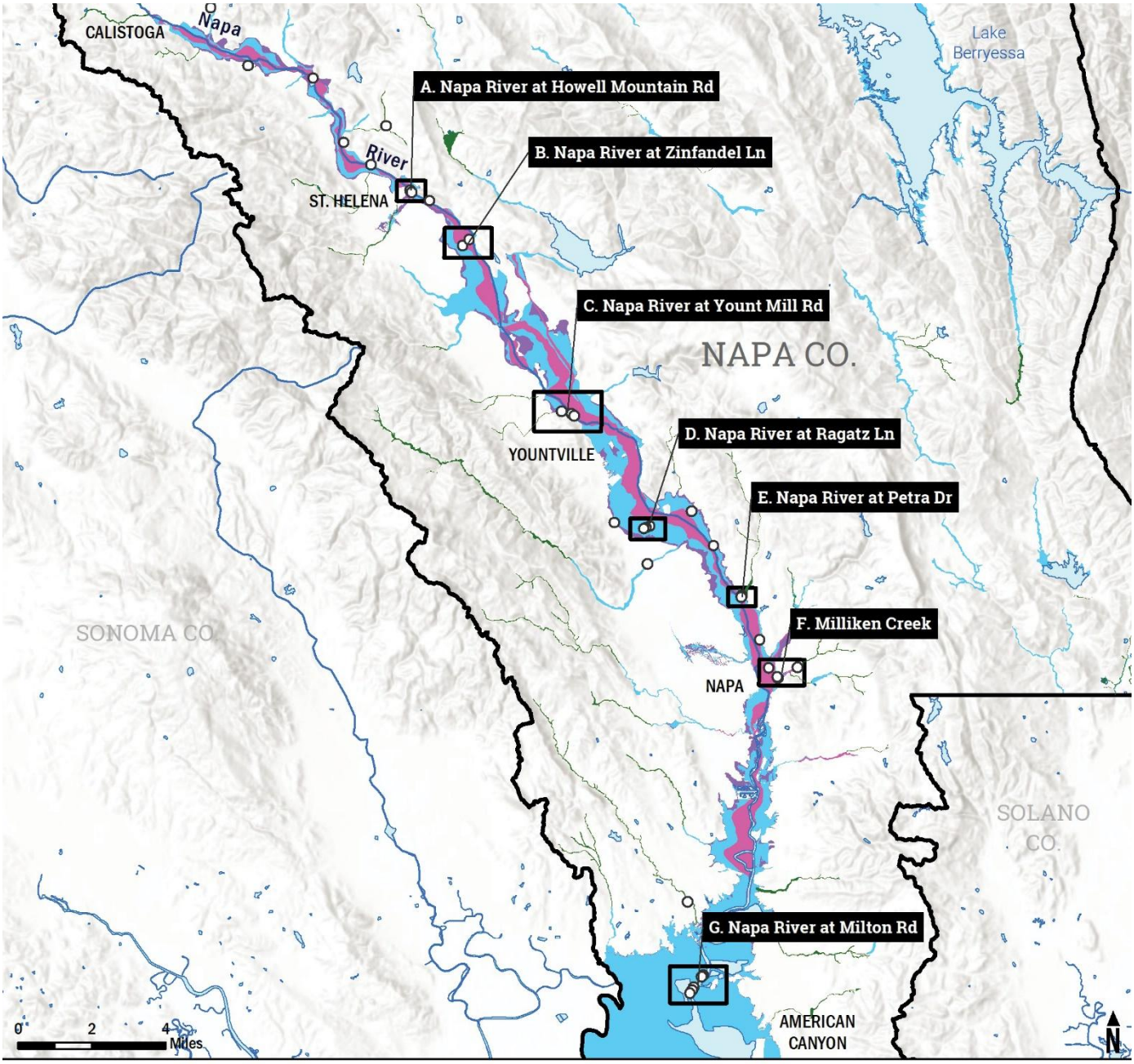
A Repetitive Loss Areas Analysis (RLAA) identifies clusters of RL and SRL properties located in close proximity and subject to similar flood hazard conditions. These repetitive loss areas (RLA) typically share the same flooding source—such as a river, creek, or coastal reach—and are susceptible to repetitive damage during high-water events. In unincorporated Napa County, repetitive loss properties are concentrated in the riverine corridors and smaller narrow tributaries.

The county-wide repetitive loss areas map in depicts all 7 identified RLAs in unincorporated Napa County. Each RLA represents a geographic cluster of RL and SRL properties that share similar flooding sources and conditions. The boundaries are based on FEMA NFIP claim records, spatial clustering of affected parcels, and local knowledge of flood hazard patterns. These areas capture the most concentrated repetitive flooding risks in the county, occurring in predominantly in the Napa River corridor.

The RLA map series prepared for this plan delineates these clusters and provides aggregated data on claim history, historic losses, and current property values for each identified RLA. These RLAs represent the most concentrated geographic expression of repetitive flooding in the county and are the logical focus for targeted mitigation actions such as structure elevation, acquisition, or floodproofing. Each RLA is profiled individually in this section, contains a summary of its location, flood source, historical flooding patterns, NFIP claims history, known mitigation actions, and recommended strategies for reducing RL exposure.

Under the Privacy Act of 1974 (5 U.S.C. 552a), FEMA restricts public release of flood insurance policy and claims data. Individual property-level information can only be shared with state and local governments for floodplain management, mitigation, or research purposes. Accordingly, this plan presents only aggregated information for each RLA and does not identify specific properties or individual claim records.

Other sources used to inform the RLAA and recommended mitigation measures include: the 2020 Napa County Multi-Jurisdictional Hazard Mitigation Plan, the 2022 City of Napa Hazard Mitigation Plan, the FEMA Local Mitigation Planning Policy Guide (2022), the FEMA Local Mitigation Planning Handbook (2023), the FEMA Flood Insurance Study (FIS) for Napa County, the California Department of Water Resources Best Available Mapping (BAM) datasets, and FEMA Mitigation Ideas (2013).



NAPA COUNTY - REPETITIVE LOSS AREAS

- Repetitive Loss Property
- Repetitive Loss Area

FEMA Flood Zones:
- Floodway
- Flood Fringe
- 500-YR
- Flood Awareness Zone

FEMA REPETITIVE LOSS DATA SUMMARY

PROPERTY COUNT:	37	BUILDING PAYOUTS:	$2,578,028
LOSSES:	114	CONTENT PAYOUTS:	$718,251
AVERAGE PAYOUT:	$28,581	TOTAL PAID:	$3,296,280

Figure 3-13: Napa County Repetitive Loss Areas

Napa River at Howell Mountain Road (RL Area A)

The Howell Mountain Road RLA lies along the Napa River near the intersection of Howell Mountain Road and Silverado Trail, where the river corridor narrows and development is situated in close proximity to the active channel (Figure 3-14). Upstream watershed areas draining the eastern hillslopes can generate rapid runoff during intense winter storm events, particularly during atmospheric river conditions common between December and February. The confined floodplain and presence of transportation crossings contribute to localized increases in water surface elevations during peak flows.

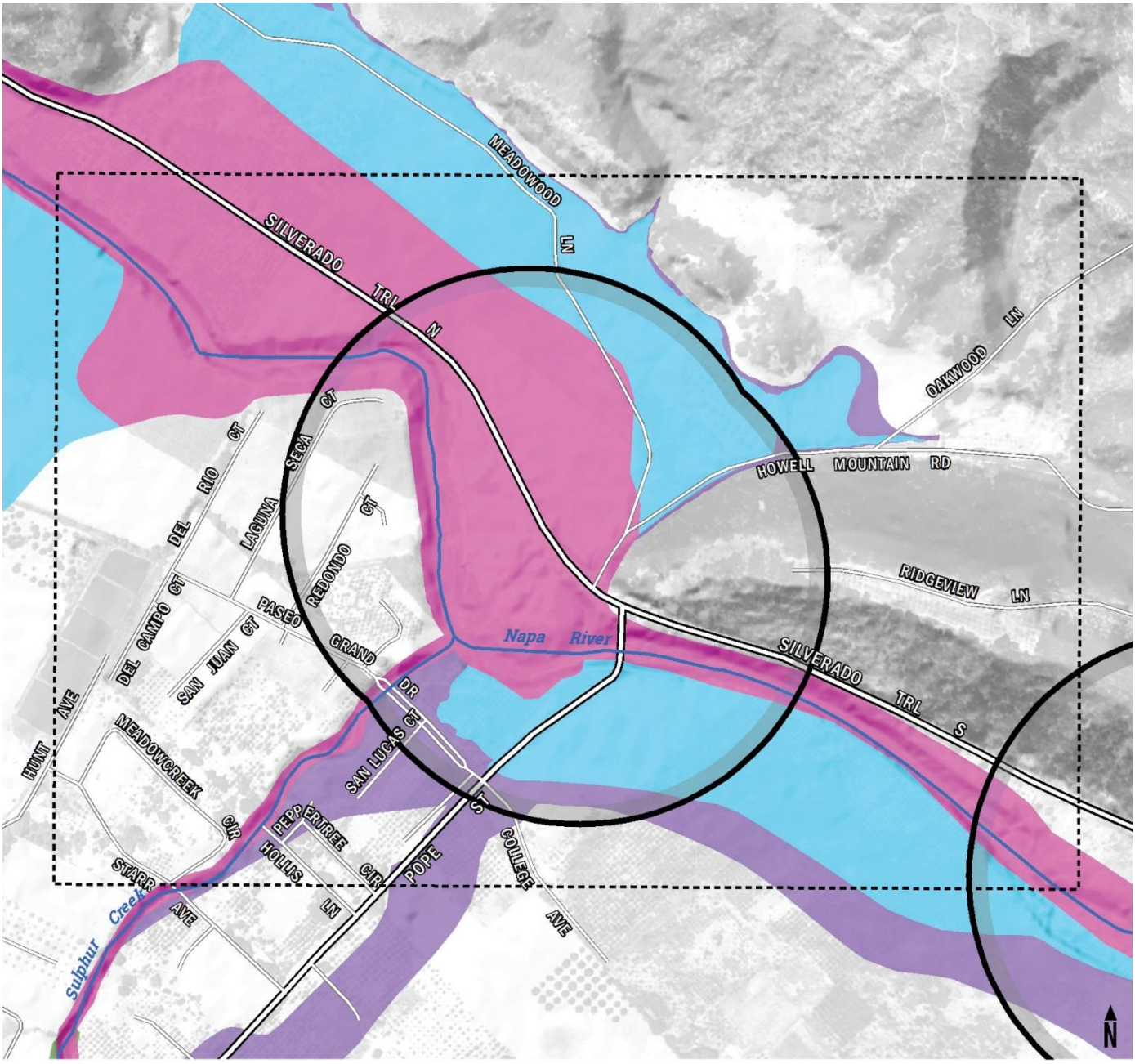
Historical flood impacts in this area have included overbank flooding affecting residential structures, roadway inundation along Silverado Trail, and localized erosion along the riverbanks. The proximity of structures to the floodway increases susceptibility to direct inundation, while limited overbank storage capacity exacerbates flood depths.

Past mitigation efforts have largely focused on regional improvements associated with the Napa River Flood Protection Project downstream; however, localized measures in this area have been limited. Property-level adaptations, including minor grading and drainage improvements, have been implemented in some cases.

Mitigation options are constrained by the narrow floodplain and existing development patterns adjacent to the river corridor. These constraints limit opportunities for channel widening or major structural improvements.

Future recommendations for the Howell Mountain Road RLA include:

- Evaluating bridge and roadway crossing capacity to reduce backwater effects.
- Enhancing riparian corridor management to improve conveyance and reduce debris accumulation.
- Promoting property-level mitigation measures such as elevation and floodproofing through FEMA programs.



REPETITIVE LOSS AREA - A. NAPA RIVER AT HOWELL MOUNTAIN RD

Repetitive Loss Area
Repetitive Loss Property (Approx.)
FEMA Flood Zones
- Floodway
- Flood Fringe
- 500-YR
- Flood Awareness Zone

FEMA REPETITIVE LOSS DATA SUMMARY

PROPERTY COUNT:	2	BUILDING PAYOUTS:	$198,800
LOSSES:	7	CONTENT PAYOUTS:	$127,635
AVERAGE PAYOUT:	$35,753	TOTAL PAID:	$326,435

Figure 3-14 Howell Mountain Rd. Repetitive Loss Area

Napa River at Zinfandel Lane (RL Area B)

The Zinfandel Lane RLA is located west of the Napa River within a low-gradient agricultural area characterized by broad floodplain conditions and limited drainage infrastructure (Figure 3-15). The flat terrain and proximity to the river result in slow drainage and prolonged inundation following storm events.

Flooding in this area is driven by a combination of Napa River overbank flow and sheet flow runoff from surrounding agricultural lands. During significant rainfall events, water can accumulate across fields and roadways, contributing to localized flooding of residential structures.

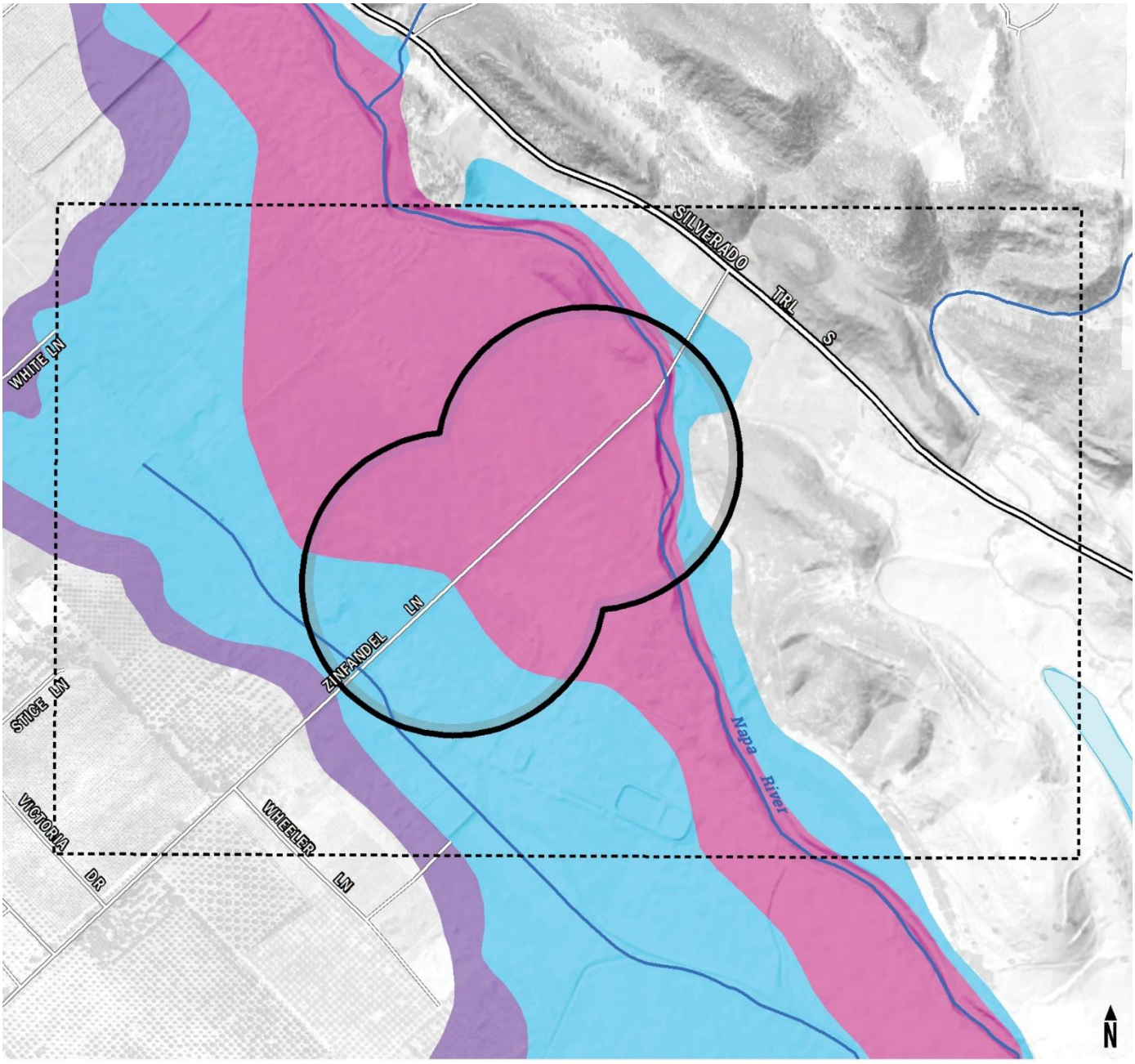
Historical impacts have included flooding of access roads, ponding on agricultural lands, and repeated inundation of structures located within the floodway. Limited stormwater infrastructure and minimal topographic relief contribute to extended flood durations.

Past mitigation actions have primarily been limited to site-specific drainage improvements and maintenance of agricultural ditches. No large-scale structural flood control measures have been implemented in this area.

Mitigation opportunities are constrained by the agricultural land use and the need to maintain drainage patterns that support farming operations.

Future recommendations for the Zinfandel Lane RLA include:

- Improving local drainage conveyance through ditch maintenance and targeted upgrades.
- Evaluating opportunities for floodplain restoration or setback to increase storage capacity.
- Encouraging participation in FEMA mitigation programs for elevation and acquisition where feasible.



REPETITIVE LOSS AREA - B. NAPA RIVER AT ZINFANDEL LN

Repetitive Loss Area
Repetitive Loss Property (Approx.)
FEMA Flood Zones
Floodway
Flood Fringe
500-YR
Flood Awareness Zone

FEMA REPETITIVE LOSS DATA SUMMARY

PROPERTY COUNT:	2	BUILDING PAYOUTS:	$165,190
LOSSES:	4	CONTENT PAYOUTS:	$9,804
AVERAGE PAYOUT:	$43,749	TOTAL PAID:	$174,994

Figure 3-15 Zinfandel Ln Repetitive Loss Area

Napa River at Yount Mill Road (RL Area C)

The Yount Mill Road RLA is located along the Napa River just north of the Town of Yountville, where the river meanders through a relatively broad but low-lying floodplain (Figure 3-16). The area is influenced by both mainstem flooding and backwater effects from nearby tributaries, including Conn Creek and Rector Creek.

During intense storm events, high flows in the Napa River combined with tributary inflows can create complex hydraulic conditions, resulting in elevated flood stages and extended inundation.

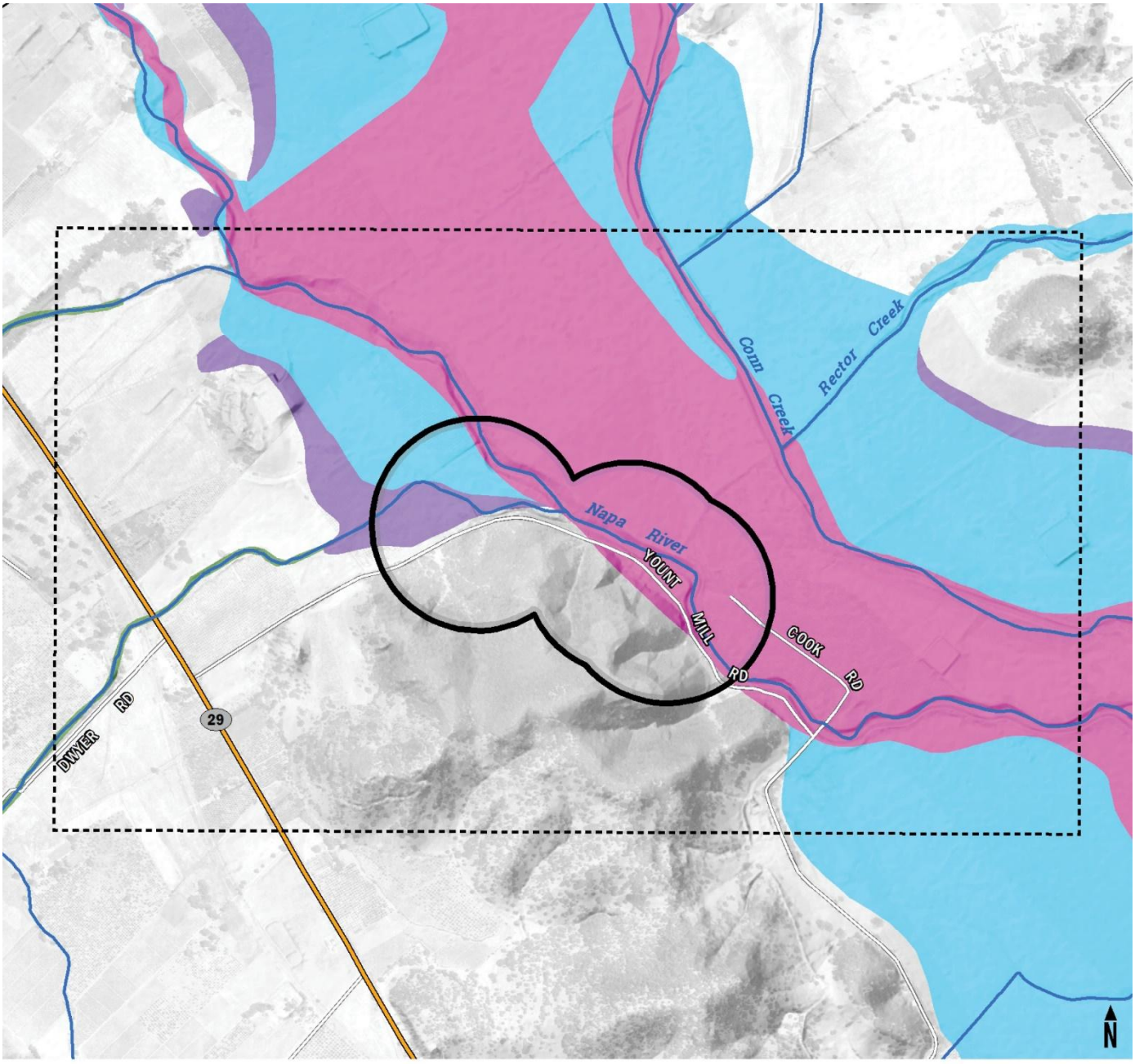
Historical flooding has resulted in impacts to residential properties, roadway closures, and ponding in low-lying areas. Limited drainage capacity and flat topography contribute to slow recession of floodwaters.

Mitigation efforts in the broader Napa River corridor, including elements of the Napa River Flood Protection Project, have reduced risk in downstream urban areas; however, this reach remains vulnerable due to its rural setting and limited infrastructure improvements.

Constraints to mitigation include the dispersed development pattern and the need to preserve agricultural land uses.

Future recommendations for the Yount Mill Road RLA include:

- Assessing drainage improvements to reduce ponding and improve floodwater recession.
- Enhancing coordination with upstream reservoir and watershed management where applicable.
- Supporting property-level mitigation measures, including elevation and floodproofing.



REPETITIVE LOSS AREA - C. NAPA RIVER AT YOUNT MILL RD

Repetitive Loss Area
Repetitive Loss Property (Approx.)
FEMA Flood Zones
Floodway
Flood Fringe
500-YR
Flood Awareness Zone

FEMA REPETITIVE LOSS DATA SUMMARY

PROPERTY COUNT:	3	BUILDING PAYOUTS:	$255,135
LOSSES:	15	CONTENT PAYOUTS:	$49,497
AVERAGE PAYOUT:	$16,172	TOTAL PAID:	$304,631

Figure 3-16 Yount Mill Rd. Repetitive Loss Area

Napa River at Ragatz Lane (RL Area D)

The Ragatz Lane RLA is situated along Hopper Creek near its confluence with the Napa River in a low-lying agricultural area east of State Route 29 (Figure 3-17). The area is subject to both tributary flooding and backwater effects from the Napa River during high-flow conditions.

Flooding is characterized by sheet flow across agricultural lands, overtopping of small drainage channels, and localized inundation of roadways and structures. The flat terrain and presence of irrigation and drainage infrastructure influence flow paths and can exacerbate flooding during storm events.

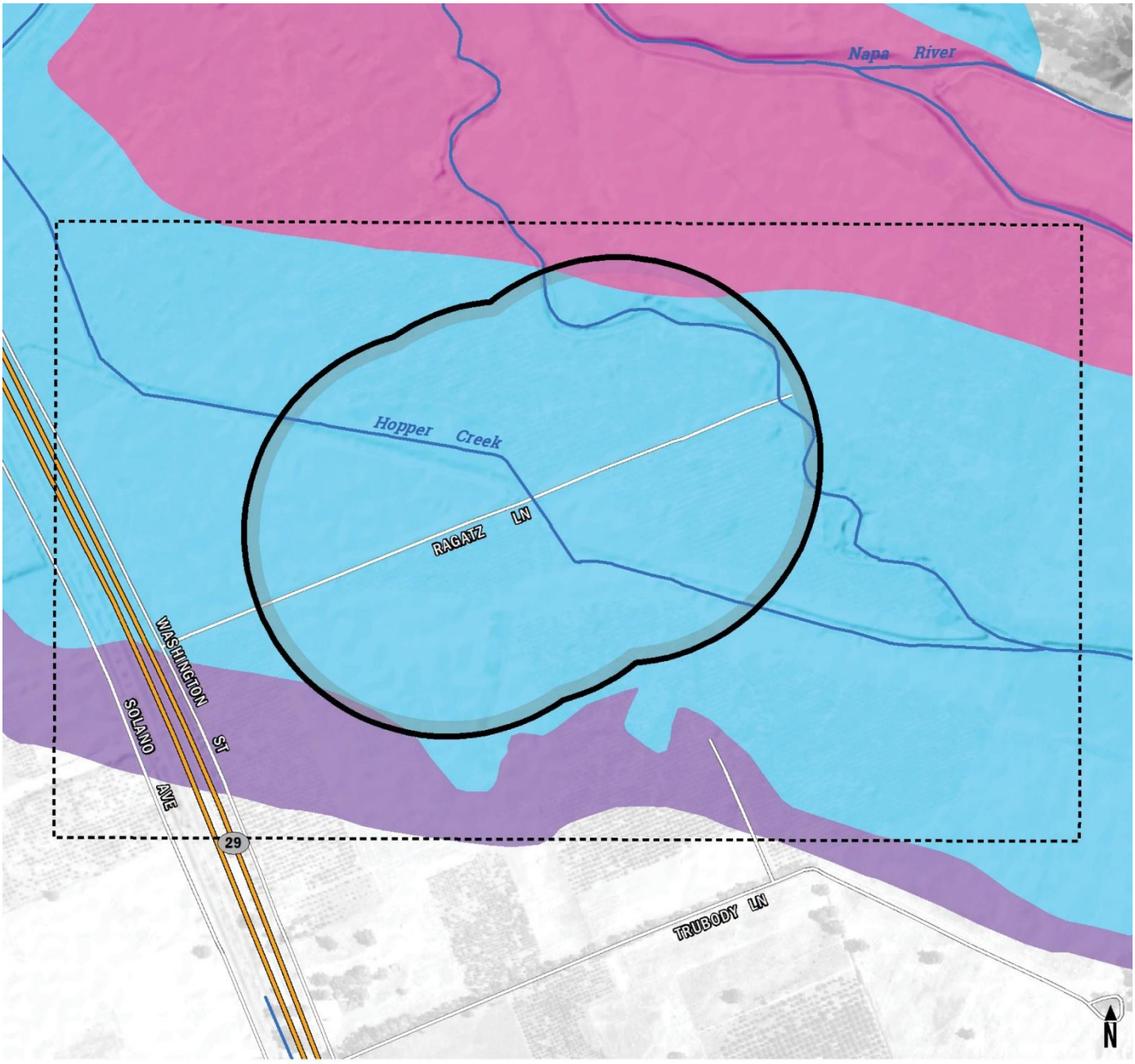
Historical impacts include roadway flooding, access limitations, and repeated damage to residential structures.

Mitigation actions to date have primarily involved maintenance of agricultural drainage systems and minor site improvements.

Mitigation opportunities are limited by the agricultural setting and the interconnected nature of drainage and irrigation systems.

Future recommendations for the Ragatz Lane RLA include:

- Improving coordination of agricultural drainage and flood management practices.
- Evaluating opportunities for localized detention or retention to reduce peak flows.
- Encouraging property-level mitigation measures such as elevation and floodproofing.



REPETITIVE LOSS AREA - D. NAPA RIVER AT RAGATZ LN

Repetitive Loss Area
Repetitive Loss Property (Approx.)
FEMA Flood Zones
Floodway
Flood Fringe
500-YR
Flood Awareness Zone

FEMA REPETITIVE LOSS DATA SUMMARY

PROPERTY COUNT:	3	BUILDING PAYOUTS:	$148,837
LOSSES:	10	CONTENT PAYOUTS:	$43,163
AVERAGE PAYOUT:	$22,967	TOTAL PAID:	$192,001

Figure 3-17 Ragatz Ln. Repetitive Loss Area

Napa River at Petra Drive (RL Area E)

The Petra Drive RLA is located near the confluence of Soda Creek and the Napa River, where residential development is situated within a dynamic floodplain environment (Figure 3-18). The confluence setting creates increased flood risk due to the interaction of flows from both watercourses.

During major storm events, backwater effects from the Napa River can impede drainage from Soda Creek, resulting in rapid rises in water levels and increased flood depths.

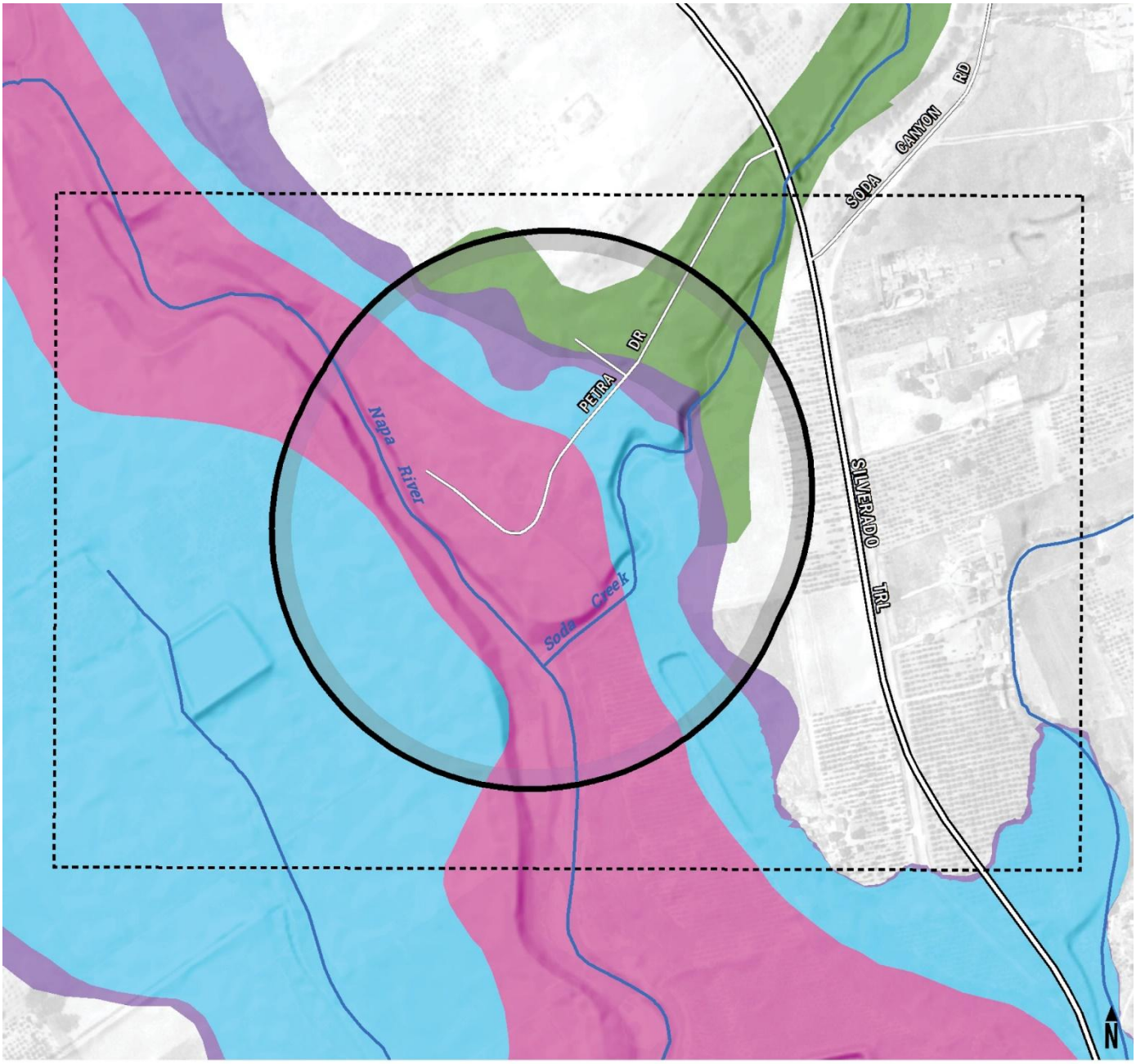
Historical flooding has included inundation of residential structures, roadway closures, and localized erosion. The proximity of homes to the floodway significantly increases exposure to flood hazards.

Past mitigation efforts have included limited drainage improvements and maintenance of creek channels. However, no comprehensive flood control project has been implemented in this area.

Mitigation constraints include the established residential development within the floodplain and limited space for structural improvements.

Future recommendations for the Petra Drive RLA include:

- Evaluating improvements to Soda Creek conveyance and confluence hydraulics.
- Enhancing early warning and emergency access planning.
- Promoting FEMA-funded elevation or acquisition of high-risk properties.



REPETITIVE LOSS AREA - E. NAPA RIVER AT PETRA DR

Repetitive Loss Area
Repetitive Loss Property (Approx.)
FEMA Flood Zones
Floodway
Flood Fringe
500-YR
Flood Awareness Zone

FEMA REPETITIVE LOSS DATA SUMMARY

PROPERTY COUNT:	4	BUILDING PAYOUTS:	$503,767
LOSSES:	15	CONTENT PAYOUTS:	$100,633
AVERAGE PAYOUT:	$47,385	TOTAL PAID:	$604,400

Figure 3-18 Petra Dr. Repetitive Loss Area

Milliken Creek (RL Area F)

The Milliken Creek RLA is located near the confluence of Milliken Creek and the Napa River within the eastern portion of the City of Napa (Figure 3-19). This area reflects an urban interface where tributary and mainstem flooding interact.

Flooding occurs when high flows in Milliken Creek coincide with elevated stages in the Napa River, reducing drainage capacity and creating backwater conditions. Urban development, roadway crossings, and constrained channels further limit conveyance.

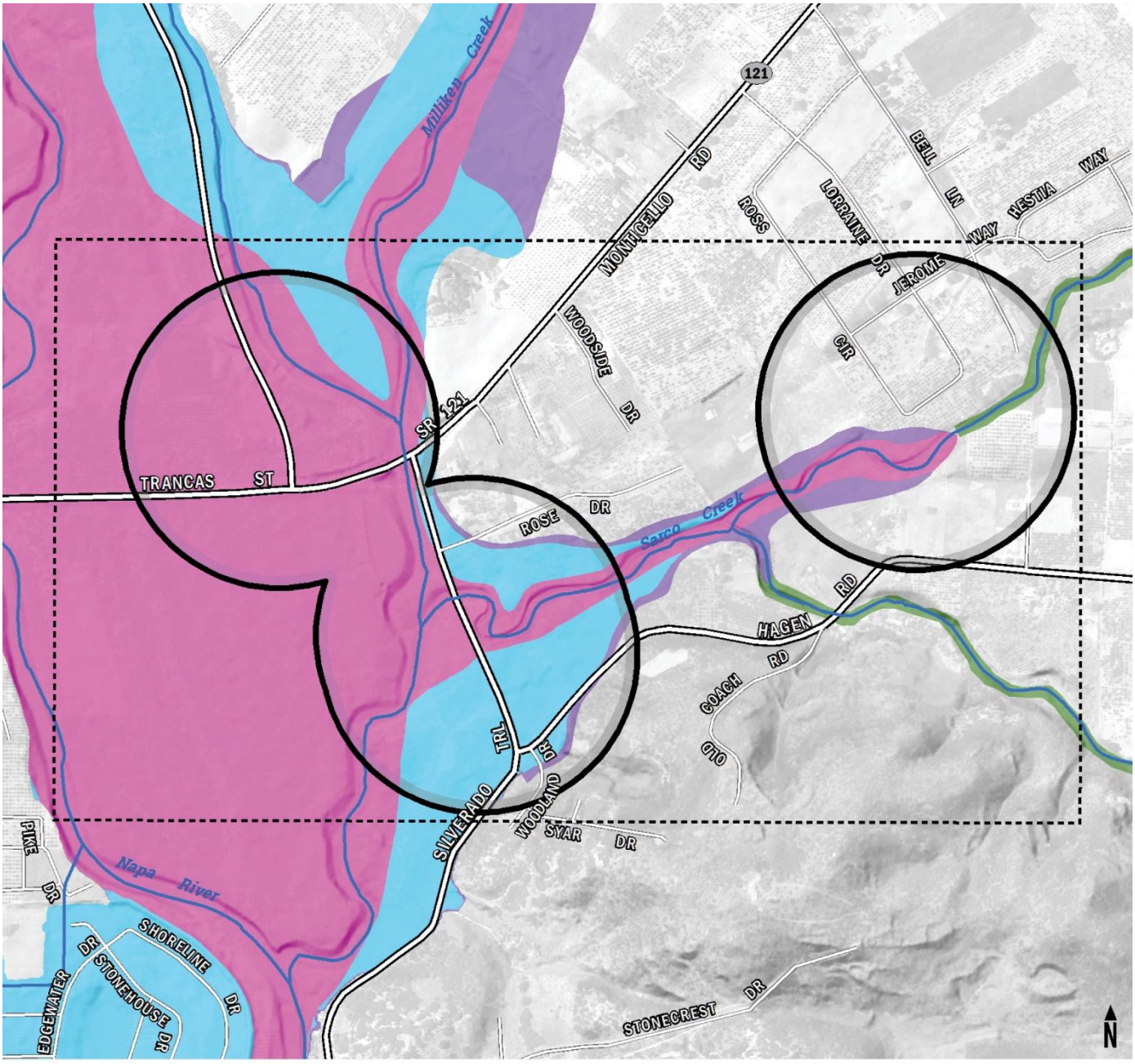
Historical impacts have included roadway flooding, property damage, and localized drainage failures. Debris accumulation in culverts and bridge crossings can exacerbate flooding during storm events.

Past mitigation actions have included maintenance of drainage infrastructure and participation in broader Napa River flood management efforts.

Mitigation constraints include urban development patterns and limited space for channel expansion.

Future recommendations for the Milliken Creek RLA include:

- Upgrading culverts and bridge crossings to improve hydraulic capacity.
- Continuing vegetation and debris management to maintain conveyance.
- Supporting property-level mitigation and stormwater system improvements.



REPETITIVE LOSS AREA - F. MILLIKEN CREEK

- Repetitive Loss Area
- Repetitive Loss Property (Approx.)
- FEMA Flood Zones
  - Floodway
  - Flood Fringe
  - 500-YR
  - Flood Awareness Zone

FEMA REPETITIVE LOSS DATA SUMMARY

PROPERTY COUNT:	4	BUILDING PAYOUTS:	$440,128
LOSSES:	14	CONTENT PAYOUTS:	$132,756
AVERAGE PAYOUT:	$45,497	TOTAL PAID:	$572,884

Figure 3-19 Milliken Creek Repetitive Loss Area

Napa River at Milton Road (RL Area G)

The Milton Road RLA is located in southern Napa County near the Napa River estuary, where the river transitions into tidally influenced marshlands (Figure 3-20). This area is characterized by very low elevations, reclaimed lands, and extensive levee systems primarily designed for agricultural and habitat management.

Flooding in this area is driven by a combination of riverine flows, tidal influence from San Pablo Bay, and the performance of surrounding levees. During high tides and storm events, water levels can rise significantly, reducing drainage capacity and increasing the likelihood of inundation.

Historical impacts have included roadway flooding, limited access during high water events, and repeated low-level flooding of properties.

Past mitigation measures have largely focused on levee maintenance and wetland management, with limited structural flood protection designed specifically for residential areas.

Mitigation options are constrained by the reliance on non-engineered or aging levee systems and the ecological importance of surrounding wetlands.

Future recommendations for the Milton Road RLA include:

- Evaluating levee conditions and opportunities for targeted improvements.
- Assessing the impacts of sea level rise and incorporating adaptation strategies.
- Enhancing evacuation planning and resilience measures for isolated properties.
- Encouraging participation in FEMA mitigation programs where applicable.



REPETITIVE LOSS AREA - G. NAPA RIVER AT MILTON RD

Repetitive Loss Area
Repetitive Loss Property (Approx.)
FEMA Flood Zones
Floodway
Flood Fringe
500-YR
Flood Awareness Zone

FEMA REPETITIVE LOSS DATA SUMMARY

PROPERTY COUNT:	5	BUILDING PAYOUTS:	$47,976
LOSSES:	13	CONTENT PAYOUTS:	$21,421
AVERAGE PAYOUT:	$5,661	TOTAL PAID:	$69,397

Figure 3-20 Milton Rd. Repetitive Loss Area

3.3.2.6 Frequency & Probability of Future Occurrences

Flooding in Napa County is a recurring and well-documented hazard, with historical records and recent events demonstrating that flood occurrences are not isolated or rare. Flood frequency terminology such as the "100-year flood" (1% annual chance event) is often misunderstood. This designation does not imply that such an event occurs only once every 100 years; rather, it indicates that there is a 1% probability of that magnitude flood occurring in any given year. Over a standard 30-year period, such as the life of a mortgage, this corresponds to approximately a 26% chance of occurrence.

Similarly, higher probability events, such as the 10-year (10% annual chance) or 50-year (2% annual chance) floods, have a substantially greater likelihood of occurring over shorter timeframes. As shown in Table 3-15, even relatively infrequent flood events have a significant cumulative probability over time. Importantly, multiple flood events of similar magnitude can occur within short intervals, as evidenced by Napa County's historical record of repeated flooding (e.g., 1986, 1995, 1997, 2005, and more recent atmospheric river events).

Table 3-15: Flood Probability Annually and Over 30-Year Period

Annual Chance	Common Name	30-Year Chance of Occurrence	Example
0.2%	500-YR Flood	**6%**	Like rolling a 100-sided die each year for 30 years, you have about a 1-in-16 chance of getting a "flood" roll.
1%	100-YR Flood	**26%**	Each year over a 30-year period, you have about a 1-in-4 chance of a flood roll.
2%	50-YR Flood	**45%**	Nearly even odds for each yearly die roll over the span of 30 years.
10%	10-YR Flood	**96%**	Almost certain to get a flood roll at least once, if not multiple times, in 30 years.
50%	2-YR Flood	**100%**	Expected to get a flood roll many times during a 30-year period.

Frequency of flooding events in Napa County is strongly influenced by regional meteorology and watershed characteristics. The county is subject to intense winter storm systems, including atmospheric rivers, which can deliver high-intensity rainfall over extended durations between approximately November and April. These events can produce rapid runoff from steep upland areas surrounding Napa Valley, resulting in sharp rises in streamflow within the Napa River and its tributaries. Smaller tributary systems, particularly those draining the eastern and western hillslopes, are characterized by flashy hydrologic response, contributing to localized flooding, debris flows, and downstream backwater effects.

While FEMA Flood Insurance Rate Maps (FIRMs) delineate Special Flood Hazard Areas (SFHAs) based on the 1% annual chance flood, actual flood risk in Napa County extends beyond these mapped boundaries. As documented in recent storm events and reflected in DWR Best Available Mapping (BAM) Flood Awareness Zones, localized flooding can occur outside mapped floodplains due to factors such as:

- Intense short-duration rainfall overwhelming drainage infrastructure

- Debris blockage at culverts and bridge crossings
- Backwater effects at tributary confluences
- Sheet flow across agricultural lands
- Tidal influence in southern Napa County near the Napa River estuary

In southern Napa County, particularly in low-lying areas influenced by San Pablo Bay, flood frequency is further affected by tidal cycles, storm surge, and sea level rise. These conditions can reduce drainage capacity and increase the duration and extent of inundation during storm events, even in the absence of extreme riverine flows.

The Napa River Flood Protection Project has been designed to reduce flood risk to the City of Napa and surrounding areas for approximately the 1% annual chance event. However, residual risk remains due to the potential for events exceeding design capacity, levee performance variability, and localized drainage limitations. Additionally, upstream and tributary flooding continues to present a risk independent of mainstem river improvements.

Based on historical occurrence, watershed characteristics, and projected climate influences, the probability of future flooding in Napa County is considered likely, corresponding to an annual probability range of approximately 10% to 100% for flood-related impacts of varying magnitudes. Smaller, nuisance-level flooding may occur annually, while more significant and damaging flood events can be expected multiple times over a multi-decade period.

Projected climate change impacts, including increased precipitation intensity, more frequent atmospheric river events, and rising sea levels, are expected to further increase both the frequency and severity of flooding in Napa County. These trends underscore the importance of continued mitigation planning, infrastructure investment, and adaptive land use strategies to reduce long-term flood risk.

3.3.2.7 Severity

The main factors affecting flood damage are water depth and velocity. Deeper and faster flood flows can cause more damage. Shallow flooding with high velocities can cause as much damage as deep flooding with slow velocity. This is especially true when a channel migrates over a broad floodplain, redirecting high velocity flows and transporting debris and sediment. Flood severity is often evaluated by examining peak discharges; Table 3-16 lists peak flows used by FEMA to map the floodplains of Napa County.

Table 3-16: Summary of Discharges in Napa County

Flooding Source/Location	Drainage sq. Miles	Peak Discharge (cubic feet/second)			
		10-%	2-%	1-%	0.2-%
Blossom Creek					
At confluence with Napa River	3.4	1,000	N/A	1,700	2,000
Cyrus Creek					
At confluence with Napa River	2.9	900	N/A	1,500	1,900
Garnett Creek					
At confluence with Napa River	6.9	1,900	N/A	3,200	3,900
Napa Creek					
At mouth	14.9	*	*	4,300	*
At the City of Napa corporate limits	14.9	2,200	*	3,500	4,500
Napa River					
Upstream of Bull Island	324	25,500	38,900	45,200	69,000
Upstream of Imola Avenue	300	26,770	39,200	44,390	53,450
Upstream of confluence of Tulucay Creek	*	25,810	38,010	42,720	51,260
Upstream of confluence of Napa Creek	*	20,040	35,600	40,100	48,300
Upstream of Trancas Street	*	22,750	33,430	39,000	44,540
Near the City of Napa (Oak Knoll Avenue)	281	18,500	*	33,000	46,000
Upstream of Oak Knoll Avenue	218	18,400	28,100	32,700	50,300
Near the City of St. Helena (Zinfandel Lane)	81.4	13,000	*	21,000	25,000
At Dunweal lane	23	7,800	N/A	12,500	15,000
At State Highway 29	21.6	7,400	N/A	12,000	14,500
At upstream corporate limits	5.4	3,300	N/A	5,100	6,400
Salvador Creek					
At confluence with Napa River	*	*	*	3,910	*
At Big Branch Road	1.8	*	*	3,213	*
Sulphur Creek					
At confluence with Napa River to Sulphur Creek Tributary	9.2	*	*	3,330[5]	*
Upstream of Sulphur Creek Tributary	7.6	*	*	3,110	*
Sulphur Creek Tributary					
At confluence with Sulphur Creek	1.1	*	*	500	*
Tulucay Creek					
At Soscol Avenue	*	2,880	*	4,530	5,500
Upstream of Camille Creek	*	2,050	*	3,250	4,050

** Data not available*

Source: Table 5 Summary of Discharges from FEMA FIS Text, 2016

[5] Flow rate reduction due to capacity restriction

3.3.2.8 Warning Time

The type and rate of flooding experienced in Napa County varies. In general, warning times for floods can be between 24 and 48 hours to prepare communities to reduce flood damages Seasonal notification for flooding can enhance awareness for citizens at risk, and, when communicated effectively, advance notification can reach target audiences on a large scale

Napa County maintains a storm watch program that serves as flood surveillance and an early warning system. The Napa Valley Regional Rainfall and Stream Monitoring System is a real-time rainfall and river-stream data network that relies on data from automated stream gages in rivers and streams throughout Napa County. The Napa County Flood Control and Water Conservation District is responsible for maintaining that data network which provides current and historical rainfall, river, and stream level monitoring data. Napa County coordinates with the National Weather Service in Reno, NV and the California Department of Water Resources for flood forecasting for the Napa River.

DWR Awareness Zones Notification

The Flood Risk Notification Program (FRN Program) is part of the Department of Water Resources' (DWR) FloodSAFE California Initiative. The program's key goal is to increase flood risk awareness by effectively communicating that risk to individual property owners, the public, and local, state, and federal agencies. This includes encouraging people to understand the levee system that protects them; be prepared and aware of their flood risk; and take appropriate actions before, during, and after flooding to protect themselves, minimize damage to their property or personal possessions, and facilitate recovery. To achieve this goal, the FRN Program:

- Sends out an annual notice to property owners whose property is at risk of flooding,
- Maintains accurate Levee Flood Protection Zone (LFPZ) maps and an associated parcel information database (note: these maps are different from Federal Emergency Management Agency regulatory maps),
- Provides people with useful ways to assess risk and reduce flood loss,
- Establishes outreach and educational projects with public involvement,
- Expands its interactive Flood Risk Notification website, and
- Collaborates with federal agencies, local agencies, and communities.

In September 2010, DWR provided the first annual written notice of flood risks to each landowner whose property is protected by State Plan of Flood Control levees and is within an LFPZ. The notice informs recipients of their property's potential flood risks and potential sources of flooding and offers flood emergency planning and preparedness tips. It encourages recipients to take preventative actions such as purchasing flood insurance, elevating or "floodproofing" their buildings, and preventing blockage of channels, drains, and ditches.

3.3.2.9 Flood Vulnerability Assessment

Flood vulnerability in Napa County is influenced by the interaction of flood hazard exposure, land use patterns, population distribution, critical infrastructure, and watershed characteristics. As shown in Figure 3-9, flood-prone areas are concentrated along the Napa River corridor from Calistoga to the Napa-Sonoma Marshes, as well as along major tributaries and low-lying areas in southern Napa County. Development within these floodplains, including residential neighborhoods, agricultural lands, and transportation corridors, contributes to increased exposure to both riverine and localized flooding hazards.

The County's physical setting further contributes to vulnerability. Steep upland watersheds surrounding Napa Valley generate rapid runoff during intense storm events, while the relatively flat valley floor and southern tidal areas are prone to prolonged inundation. Tributary systems such as Napa Creek, Milliken Creek, and others can produce localized flooding that interacts with mainstem Napa River flooding. In southern Napa County, tidal influence, subsidence of reclaimed lands, and reliance on levee systems—many of which were constructed for agricultural or habitat purposes rather than flood protection—further increase vulnerability to flooding and compound flood hazards.

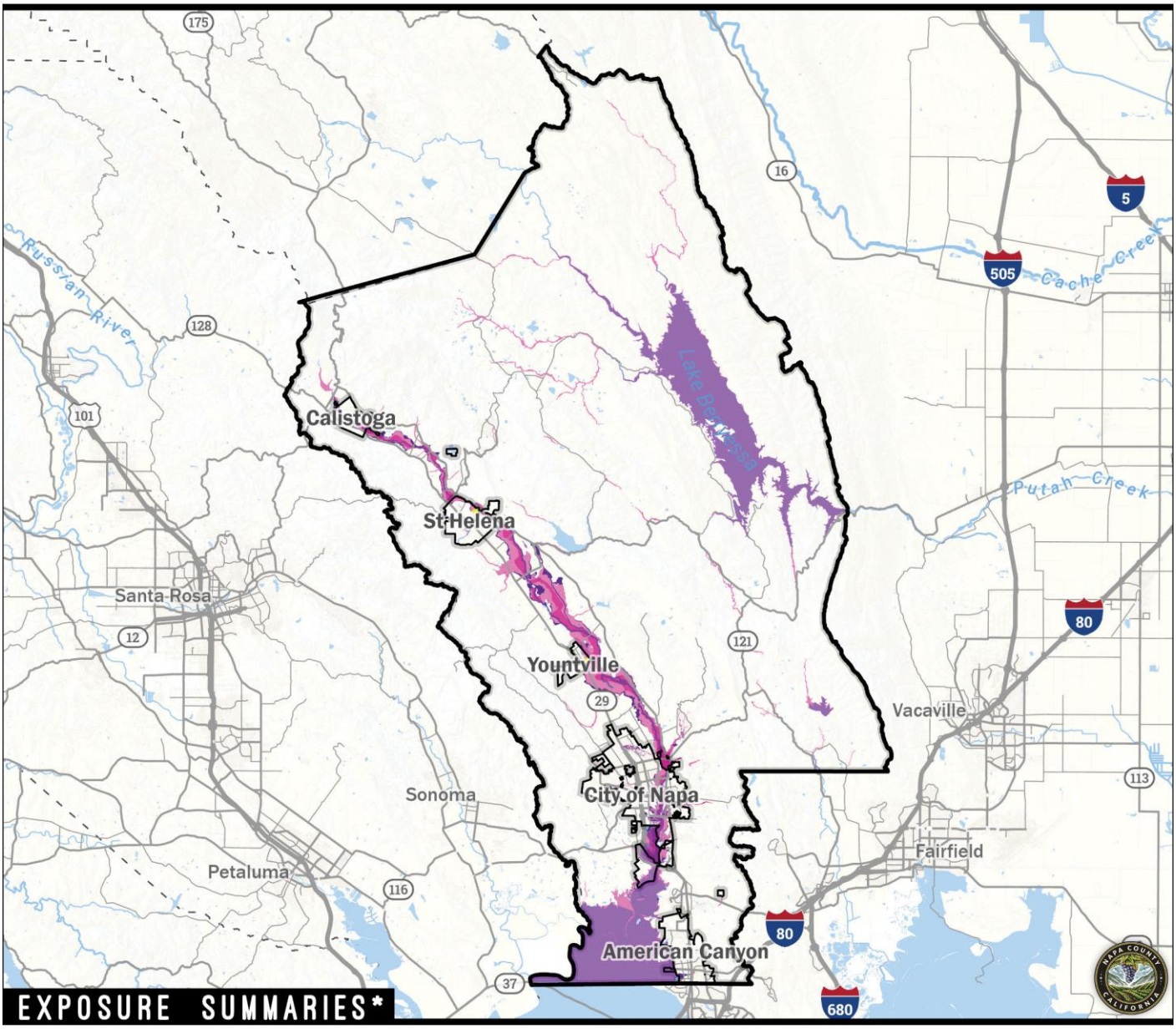
Population and development patterns also play a significant role. Communities located within or adjacent to Special Flood Hazard Areas (SFHAs), including portions of the City of Napa, Yountville, St. Helena, and unincorporated areas, face heightened risk of structural damage and disruption. Agricultural operations throughout the valley are vulnerable to crop loss, soil erosion, and damage to irrigation infrastructure. Additionally, repetitive loss properties identified along the Napa River and its tributaries highlight areas of persistent flood risk.

Critical infrastructure and community lifelines are also exposed. Key transportation routes, including State Route 29, Silverado Trail, and local roadways, traverse flood-prone areas and may become impassable during flood events, limiting emergency response and evacuation. Utilities and essential services located within flood hazard areas may experience service interruptions, compounding the impacts on residents and businesses.

This section evaluates the populations, structures, critical facilities, and infrastructure most at risk from flooding, as well as the potential impacts to the local economy, agricultural resources, and natural systems. Particular attention is given to vulnerable populations, including residents in low-lying or isolated areas, agricultural workers, and individuals with limited mobility. The assessment also considers how flooding may disrupt transportation networks, utilities, and emergency services.

FEMA FLOOD RISK EXPOSURE

UNINCORPORATED COUNTY



EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA

Count	Exp. Rate**
2,795	12%

Count Includes: 100 + 500

PARCEL COUNT IN HAZARD AREA

Count	Exp. Rate**
874	6%

Count Includes: 100 + 500

PARCEL VALUE IN HAZARD AREA

	Exp. Rate**
Sum of Improvement Value: $591,473,033	5%
Sum of Content Value: $459,168,723	5%

Count Includes: 100 + 500

CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA

Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
Essential Facilities	2	7%	100 + 500
Hazmat	27	11%	
High Potential Loss	34	11%	Sum of Transportation & Lifeline Linear Mileage
Transportation & Lifeline	62	42%	264 14%

MAP LEGEND

100YR
FLOODWAY
LEVEE
500YR

*Exposure summaries include 100-year and 500-year flood zone areas. Hazard data source: FEMA.
**Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

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Figure 3-21: Exposure Summary – Napa County Flood Risk (FEMA)

3.3.2.9.1 Population

Population at risk from flooding in Napa County was estimated by intersecting FEMA's 100-year (1% annual chance) and 500-year (0.2% annual chance) floodplain boundaries with U.S. Census Bureau population data. Using GIS, census blocks, and tracts, populations were weighted according to the percentage of each block lying within the mapped flood hazard areas.

The results show that a substantial share of the county's population resides within areas that could experience significant flooding during a 100-year event, with additional residents located in areas subject to the less frequent but still damaging 500-year flood. Most at-risk residents are in the broader flood fringe, with smaller portions in high-velocity floodways and low-lying coastal areas vulnerable to storm surge and wave overtopping.

Using this approach, it was estimated that almost two thousand eight hundred county residents are exposed to some sort of FEMA-identified flood risk, in either 100-year or 500-year floodplains, as shown in Figure 3-22 and Table 3-17

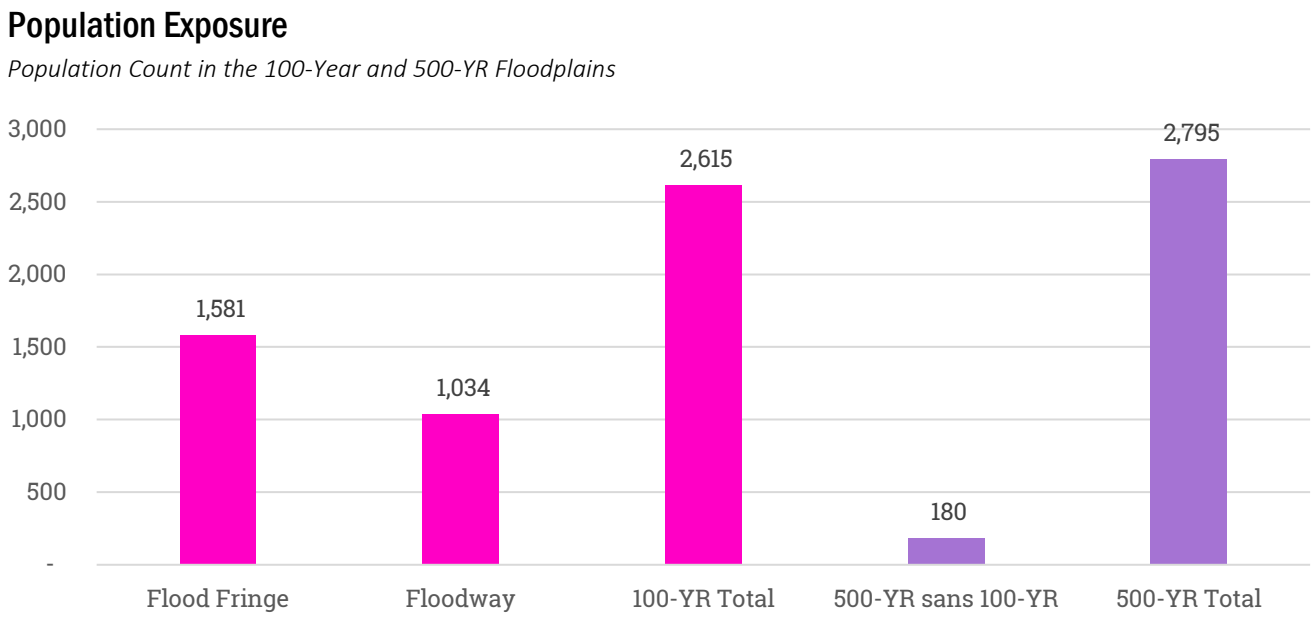


Figure 3-22: Napa County Population Exposed to Flood Risk

Table 3-17: Napa County Population Exposed to Flood Risk

	Total Population
Unincorporated County	22,468

Flood Hazard Zone	Population Count	% of Total
Flood Fringe	1,581	*7.04%*
Floodway	1,034	*4.60%*
100-YR Total*	2,615	*11.64%*
500-YR sans 100-YR	180	*0.80%*
500-YR Total	2,795	*12.44%*

**Special Flood Hazard Area (SFHA)*

Population exposure to flood hazards in Napa County is concentrated along the Napa River corridor and its primary tributaries, as well as in low lying areas in the southern portion of the county. Communities along the Napa River from Calistoga through St. Helena, Yountville, and the City of Napa contain some of the highest concentrations of residents within FEMA mapped floodplains. Additional exposure occurs along tributary systems such as Napa Creek, Milliken Creek, and Browns Valley Creek, where development extends into areas influenced by both riverine and localized flooding.

In the northern and central portions of the county, smaller but notable population clusters are located along valley floors and creek corridors near Calistoga and St. Helena, where steep surrounding terrain contributes to rapid runoff and localized flood hazards. In the City of Napa and surrounding unincorporated areas, higher density development within the valley floor increases the number of people exposed to flooding, particularly near the Napa River and its tributaries.

In southern Napa County, including areas near American Canyon and the Napa Sonoma Marshes, population exposure is shaped by low elevations, tidal influence, and levee systems. While population density is generally lower in these areas, flood risk can be more persistent due to limited drainage and prolonged inundation during storm events and high tides. These patterns reflect historical settlement along waterways and valley corridors, where developable land has been concentrated.

3.3.2.9.2 Property

Table 3-18 summarizes parcel exposure to flood hazards in Napa County. Within the 100-year floodplain, approximately $890 million in combined structure and content value is exposed to flood risk. Of this total, about $234 million is located within the floodway, where the highest hazard exists due to depth and velocity of flooding, while the remaining exposure is within the flood fringe areas subject to inundation during major storm events. When including the 500-year floodplain, total exposure increases to over $1.05 billion in combined value. These figures highlight the substantial economic risk associated with flooding in Napa County and reinforce the importance of continued mitigation and flood risk management efforts.

The highest concentration of at-risk assets follows the Napa River corridor, extending from Calistoga through St. Helena, Yountville, and into the City of Napa. Within this corridor, a mix of residential, commercial, and agricultural properties are located within mapped flood hazard areas, reflecting historic development patterns along the valley floor. Additional clusters of exposed assets occur along tributaries such as Napa Creek, Milliken Creek, and Browns Valley Creek, where localized flooding and backwater effects contribute to risk.

In southern Napa County, asset exposure is concentrated in low lying areas near the Napa Sonoma Marshes and the Napa River estuary. Although development is less dense in this area, properties are subject to persistent flood risk due to tidal influence, limited drainage capacity, and reliance on levee systems.

Overall, the distribution of exposed parcels reflects a predominantly riverine flood hazard pattern, with the greatest concentrations of value located along the Napa River and its tributaries. These patterns underscore the need for a combination of watershed based, structural, and property level mitigation strategies to reduce long term flood risk across Napa County.

Table 3-18: Napa County Parcels Exposed to Flood Risk

	Total Parcels		Total Market Value ($)	Total Content Value ($)	Total Value ($)	
Unincorporated County	13,668		$11,215,199,644	$9,248,691,039	$20,463,890,683	
Flood Hazard Zone	**Parcel Count**	**% of Total**	**Market Value Exposure ($)**	**Content Value Exposure ($)**	**Total Exposure ($)**	**% of Total**
Flood Fringe	553	*4.0%*	$373,057,827	$282,519,082	$655,576,909	*3.2%*
Floodway	175	*1.3%*	$125,068,121	$109,379,109	$234,447,230	*1.1%*
100-YR Total	728	5.3%	$498,125,948	$391,898,190	$890,024,139	4.3%
500-YR sans 100-YR	146	*1.1%*	$93,347,085	$67,270,532	$160,617,617	*0.8%*
500-YR Total	874	6.4%	$591,473,033	$459,168,723	$1,050,641,756	5.1%

Note: The table above does not display loss estimation results; the table exhibits total value at risk based upon the hazard overlay and Napa County Assessor data.

3.3.2.9.3 Critical Facilities & Infrastructure

Essential facilities, high potential loss sites, and lifeline infrastructure in Napa County face notable flood risk due to their location within FEMA mapped 100-year and 500-year floodplains. This assessment evaluates exposure only, meaning facilities are identified based on whether they intersect mapped hazard areas. No first floor elevation or site specific depth data was available, so these results represent potential exposure rather than expected damage.

Flood exposure is concentrated along the Napa River corridor and its major tributaries, where a number of public and private assets intersect flood hazard zones. Essential facilities in flood prone areas include fire

stations, emergency shelters, and farmworker housing, all of which play critical roles in emergency response and community resilience. While no essential facilities are located within mapped floodways, several are within the 100-year floodplain and may experience operational disruption during significant flood events.

Transportation and lifeline infrastructure represent the largest share of exposed assets. A total of 62 transportation related facilities intersect flood hazard areas, including 58 bridges, which are particularly vulnerable to high flows, debris accumulation, and scour. Flooding at these crossings can restrict access, isolate communities, and delay emergency response. Additional exposed infrastructure includes a wastewater treatment facility, water supply intake, and an airport, all of which are essential to maintaining basic services during and after flood events.

High potential loss facilities are also present within flood hazard areas, including a mix of real property assets, emergency shelters, and farmworker housing. These sites may experience significant economic and social impacts if damaged. Hazardous materials facilities represent another key area of concern, with 27 sites located within flood hazard zones, including several within the floodway. Flooding at these locations could result in the release of hazardous substances, posing risks to public health and the environment.

Overall, the distribution of exposed facilities reflects Napa County's reliance on infrastructure located within valley floors and along waterways. As shown in Table 3-19, a total of 125 critical facilities and infrastructure assets intersect the 100-year and 500-year floodplains. This concentration of essential services and lifeline systems within flood prone areas highlights the importance of targeted mitigation actions, including infrastructure hardening, redundancy planning, and continued maintenance to reduce the risk of service disruption during future flood events.

Table 3-19: Napa County Critical Facilities Exposed to Flood Risk

Infrastructure Type	Flood Fringe	Floodway	100-YR Total	500-YR sans 100-YR	500-YR Total
Essential Facilities	2	-	2	-	2
EOC	-	-	-	-	-
Fire Station	2	-	2	-	2
Hospital	-	-	-	-	-
Law Enforcement	-	-	-	-	-
High Potential Loss	10	5	15	19	34
Adult Residential Care	-	-	-	-	-
Child Care Center	-	-	-	-	-
Church	1	-	1	-	1
Communication Tower	-	-	-	-	-
Dam	-	-	-	-	-
Emergency Shelter	2	-	2	-	2
Farm Worker Housing	2	-	2	-	2

Infrastructure Type	Flood Fringe	Floodway	100-YR Total	500-YR sans 100-YR	500-YR Total
Historic Building	-	-	-	-	-
Library	-	-	-	-	-
Mobile Home Park	-	-	-	-	-
Nursing Home	-	-	-	-	-
Private School	-	-	-	-	-
Public School	-	-	-	-	-
Real Property Asset*	5	5	10	19	29
Transportation and Lifeline	36	25	61	1	62
Airport	1	-	1	-	1
Bridge	33	25	58	-	58
Bus Stop	-	-	-	-	-
HMMWC Asset	-	-	-	-	-
HMMWC Dam	-	-	-	-	-
HMMWC Hydrant	-	-	-	-	-
NG Station	-	-	-	-	-
Power Plant	-	-	-	1	1
Substation	-	-	-	-	-
Wastewater Treatment Facility	1	-	1	-	1
Water Supply Intake	1	-	1	-	1
Water Tank	-	-	-	-	-
Water Treatment Facility	-	-	-	-	-
Hazmat	14	7	21	6	27
Geotracker Cleanup Site	-	-	-	-	-
HWTS Active Facility	14	7	21	6	27
Landfill	-	-	-	-	-
Grand Total	**62**	**37**	**99**	**26**	**125**

**Real Property Assets are digitized insurance rolls for demonstrating value and ownership and may have overlapping points with other categories such as fire stations and law enforcement.*

Lifeline infrastructure in Napa County, including transportation networks, utilities, and levee systems, faces notable flood risk due to its location within FEMA mapped 100-year and 500-year floodplains. Much of this infrastructure is concentrated along the Napa River corridor and across the valley floor, where flood hazards are most prevalent.

Transportation infrastructure represents the largest share of exposed lifeline systems. As shown in Table 3-20, more than 238 miles of roadway are located within the 100-year floodplain, with an additional 26 miles in the 500-year floodplain. These include major roads such as State Route 29 and Silverado Trail, as well as

an extensive network of local and service roads that traverse flood prone areas. Flooding along these routes can restrict regional mobility, isolate rural and unincorporated communities, and delay emergency response and recovery efforts. Bridges and roadway crossings are particularly vulnerable to high flows, debris accumulation, and scour, increasing the likelihood of closures during storm events. Rail infrastructure is also exposed, with over 10 miles intersecting flood hazard areas, creating potential disruptions to goods movement and regional connectivity.

Utility systems are similarly exposed. Natural gas pipelines, electric transmission lines, and water and wastewater infrastructure cross floodplains throughout the county. Flooding can damage these systems or interrupt service, resulting in power outages, reduced water supply reliability, wastewater overflows, and potential public safety hazards. Critical facilities such as wastewater treatment infrastructure and water supply systems located within flood hazard areas are particularly vulnerable to operational disruption during flood events.

Levee systems, which extend over 100 miles within mapped flood hazard areas, are a key component of Napa County's flood management system, particularly in southern portions of the county. However, many of these levees were constructed for agricultural or habitat management purposes and do not provide a consistent level of flood protection. Overtopping or failure of these systems can result in rapid inundation of adjacent lands, including transportation corridors and utility infrastructure.

Overall, the widespread exposure of lifeline infrastructure reflects the county's reliance on systems located within valley floors and along waterways. The concentration of roads, utilities, and levees within flood prone areas underscores the importance of resilient design, regular maintenance, and emergency planning. As summarized in Table 3-20, a total of approximately 264 miles of lifeline infrastructure intersect flood hazard zones, highlighting the potential for significant service disruptions during major flood events and the need for targeted mitigation strategies.

Table 3-20:Napa County Lifeline Infrastructure Exposed to Flood Risk

Lifelines (miles) - Flood Risk Exposure					
Infrastructure Type (linear)	Flood Fringe	Floodway	100-YR Total	500-YR sans 100-YR	Grand Total
Levee	94.7	6.3	101.0	0.5	101.5
NG Pipeline	3.5	0.7	4.1	0.6	4.8
Railroad	4.8	-	4.8	5.3	10.2
Transmission Line	7.2	1.2	8.4	0.9	9.2
Street OSM	97.3	22.5	119.8	23.6	143.4
Highway & Interstate	1.1	-	1.1	0.1	1.1
Major Road	3.7	0.3	3.9	0.8	4.7

Lifelines (miles) - Flood Risk Exposure					
Residential Road	11.3	1.9	13.2	2.1	15.3
Road - Secondary	6.6	3.6	10.2	2.6	12.8
Road - Tertiary	6.6	1.5	8.1	1.5	9.6
Service Road	60.9	14.7	75.6	16.2	91.9
Unclassified	7.2	0.5	7.7	0.3	8.0
Grand Total	**207.5**	**30.7**	**238.2**	**26.1**	**264.2**

**Partially Overlaps "All Roads".*

3.3.2.10 Development Trends

Napa County faces ongoing challenges in balancing development pressures with flood hazards, particularly as climate change increases the frequency and intensity of storm events and influences downstream tidal conditions. Unlike coastal counties where flood risk is driven by ocean processes, flooding in Napa County is primarily riverine, centered on the Napa River watershed and its tributary systems. However, in southern portions of the county, flood risk is also influenced by tidal backwater effects and sea level rise, creating compound flooding conditions in low lying areas. Future development in these areas must account for multiple pathways of flooding, including extreme rainfall, tributary overflow, and reduced drainage capacity during high tide conditions.

Flood risk management in Napa County relies on a combination of structural and non structural approaches. The Napa River Flood Protection Project provides significant flood risk reduction along portions of the mainstem river, particularly in and around the City of Napa, but much of the watershed including tributary corridors and unincorporated areas remains vulnerable to flooding. In southern Napa County, levee systems are present but are largely designed for agricultural and habitat management rather than engineered flood protection, limiting their effectiveness during major storm events. As a result, localized flooding continues to occur in areas with constrained channels, aging infrastructure, and limited drainage capacity.

Future growth in Napa County is guided by General Plan policies that emphasize limiting development in flood hazard areas, preserving floodplains for agricultural and open space uses, and requiring mitigation measures such as elevation, floodproofing, and drainage improvements where development does occur. Development trends continue to reflect a concentration of residential and agricultural uses along the valley floor, where flood exposure is inherently higher. In unincorporated areas, rural development patterns and reliance on local road networks further increase vulnerability to flood related disruptions.

Looking ahead, more intense atmospheric river events, changing watershed conditions, and sea level rise in the southern portion of the county are expected to expand the extent and severity of flooding. These trends highlight the need for continued investment in flood management infrastructure, updated hazard mapping, and proactive land use planning. Ensuring that future development does not increase flood risk will require integrating watershed based approaches, maintaining natural floodplain functions, and prioritizing resilience in both urban and rural areas of Napa County.

3.3.2.11 Climate Change Impacts

Flooding is a recurring and costly hazard in unincorporated Napa County, with climate change expected to increase both the frequency and intensity of extreme precipitation events, particularly atmospheric rivers. These changes are anticipated to produce higher peak flows in the Napa River and its tributaries, expand flood extents, and increase the likelihood of localized flooding in smaller, unmapped watersheds. In southern Napa County, sea level rise and tidal influences will further compound flood risks by reducing drainage capacity and increasing backwater effects. These evolving conditions will disproportionately impact vulnerable populations, critical facilities, and aging infrastructure systems.

Vulnerable Populations & At-Risk Facilities

Several populations in Napa County face elevated flood risk due to their location and limited ability to respond to or recover from flood events. County operated farmworker housing centers located within the Agricultural Preserve are situated in mapped flood zones and house approximately 180 low income residents who may have limited access to evacuation resources or temporary shelter options. Similarly, critical community facilities such as Calistoga Elementary School are located within both the one percent annual chance floodplain and a dam inundation zone, increasing the potential for compounded hazard exposure during extreme events.

Repetitive loss properties also represent a concentration of vulnerability, with 34 properties in unincorporated Napa County accounting for over $2.7 million in cumulative flood insurance claims. These properties highlight persistent exposure to flooding and indicate areas where structural and non structural mitigation measures remain limited or underutilized.

Infrastructure & Access Constraints

Flooding in Napa County frequently affects transportation and drainage infrastructure located within floodplains. Roads, culverts, and local access routes are susceptible to inundation, erosion, and structural damage during flood events, which can isolate rural communities, delay emergency response, and disrupt economic activity. Stormwater management systems, including culverts, channels, and detention capacity, are critical to flood mitigation but may be undersized or impacted by sedimentation, debris, or changing hydrologic conditions. Limitations in stormwater storage and conveyance capacity can exacerbate localized flooding, particularly in developed valley floor areas and agricultural lands.

Systemic & Planning Challenges

Flood risk in Napa County is further influenced by the need to regularly update zoning, floodplain management ordinances, and development standards to reflect changing conditions, including population growth, land use changes, and evolving hazard data. In addition, public awareness of flood risk remains a challenge, as some residents and business owners may not fully understand their exposure or the importance of preparedness measures such as flood insurance, evacuation planning, and property level mitigation.

Climate Change Trends

Projected increases in the intensity of atmospheric river events will likely result in more frequent high flow conditions, increased sediment transport, and greater strain on both natural and engineered drainage systems. These changes may expand flood hazard areas beyond currently mapped FEMA Special Flood Hazard Areas, particularly in smaller tributary systems and flood awareness zones identified through Best Available Mapping. In southern Napa County, rising sea levels will further reduce the effectiveness of existing drainage infrastructure and levee systems that were not designed for future hydrologic conditions.

Future Considerations & Mitigation Direction

Addressing these risks will require a coordinated approach that prioritizes vulnerable populations and critical facilities while enhancing system wide resilience. Key considerations include improving flood risk awareness and outreach, particularly for underserved communities; investing in upgrades to stormwater and transportation infrastructure; addressing repetitive loss properties through mitigation programs; and maintaining up to date floodplain regulations and mapping. By aligning mitigation actions with identified problem statements, Napa County can reduce long term flood risk, improve emergency response capabilities, and enhance resilience to future climate driven flood events.

3.3.2.12 Flood Hazard Problem Statements

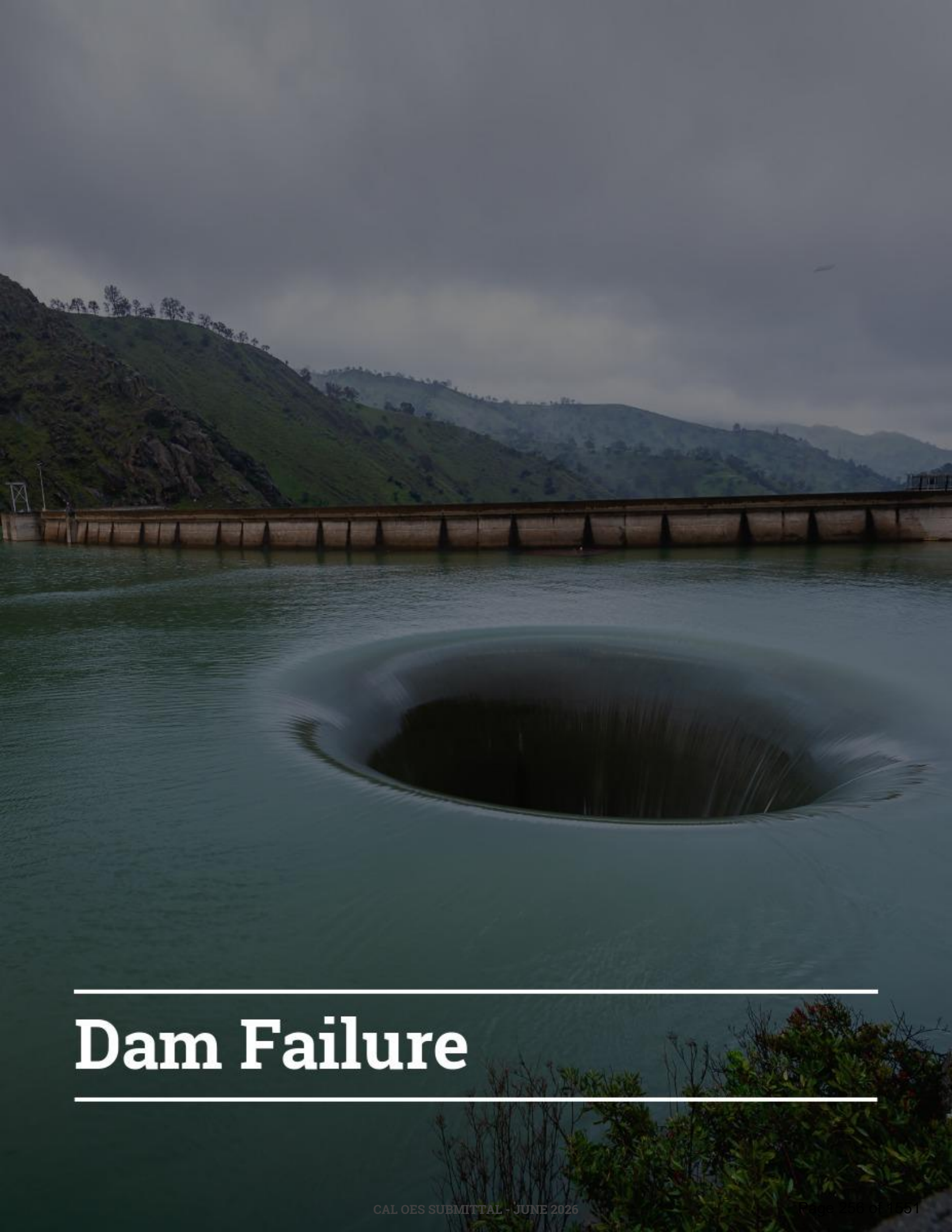
As part of the flood mitigation planning process, the Napa County Planning Team developed areas of concern (i.e., problem statements) that summarize the county's most pressing flood-related vulnerabilities and challenges. The problem statements were developed based on the updated risk assessment and vulnerability analysis contained herein, as well as the team's local knowledge and experience and community input.

These problem statements are not intended to be all-encompassing or to describe each and every issue associated with flood. Instead, they highlight the most urgent concerns that can be addressed within the scope of this MJHMP. Each statement will be linked to at least one mitigation action, ensuring that identified needs are met with specific, measurable, and equitable solutions. Table 3-21 presents the flood problem statements for Napa County, along with their associated area of concern and reference numbers for cross-linking to the mitigation actions in Table 4-4.

Table 3-21: Napa County Flood Hazard Problem Statements

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-FL-NCo-102	Flood	Victim	**Napa County**	Napa County owns 3 farmworker centers located within flood hazard zones, the residents of which are low-income and vulnerable to displacement after an event without assistance.	ma-FL-NCo-59, ma-FL-NCo-57

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-FL-NCo-110	Flood	Victim	**Napa County**	Calistoga Elementary School is located within a high flood risk area and dam inundation zone, posing risks to children and staff during a flood event.	ma-FL-NCo-52, ma-FL-NCo-55, ma-FL-NCo-56, ma-FL-NCo-57
ps-FL-NCo-117	Flood	Threat	**Napa County**	County zoning and floodplain regulations may be inadequate and may not reflect changes in development patterns, population growth, and recent hazard mapping updates.	ma-FL-NCo-54, ma-DR-NCo-26, ma-CC-NCo-13
ps-FL-NCo-119	Flood	Threat	**Napa County**	Approximately 34 Repetitive Loss properties with substantial historical losses exist in the County, underscoring the need for property-level mitigation and funding strategies.	ma-FL-NCo-51, ma-FL-NCo-53, ma-FL-NCo-61, ma-FL-NCo-54, ma-FL-NCo-57
ps-FL-NCo-128	Flood	Threat	**Napa County**	Many residents and business owners lack awareness of flood risk, mitigation options, and available assistance programs.	ma-AH-NCo-6, ma-FL-NCo-54
ps-FL-NCo-129	Flood	Impact	**Napa County**	Critical infrastructure located in the floodplain, especially roads and culverts, can be inundated and damaged or destroyed during flood events, hindering emergency response.	ma-FL-NCo-57, ma-FL-NCo-58, ma-FL-NCo-60, ma-AH-NCo-4, ma-FL-NCo-51
ps-FL-NCo-395	Flood	Threat	**Napa County**	Accelerating sea-level rise, higher storm surges, and increasing atmospheric and heavy rain events due to climate change, together, increase the probability of levee failures in the Sacramento-San Joaquin Delta.	ma-AH-NCo-6, ma-DR-NCo-26, ma-CC-NCo-13, ma-FL-NCo-51, ma-FL-NCo-54, ma-FL-NCo-57



Dam Failure

3.3.3 Dam Failure Hazard Profile



Dam failure can be sudden and catastrophic to all life and property downstream. Hundreds of dam failures have occurred throughout U.S. history, mostly before safety legislation was passed in 1972, that caused immense property and environmental damages and took thousands of lives. As the nation's dams age and population increases, the potential for deadly dam failures grows. (Association of State Dam Safety Officials, 2024)

Timber, rock, concrete, earth, steel, or a combination of these materials may be used to build a dam. Dams must have spillway systems to safely convey normal stream and flood stage flows over, around, or through the dam. Spillways are commonly constructed of non-erosive materials such as concrete. Dams also have a drain or other water-withdrawal facility to control the reservoir level and to lower or drain the reservoir for normal maintenance and emergency purposes.

Dam failures can result from earthquakes, structural instability, or intense rain in excess of design capacity, but typically occur in one of four ways:

- **Overtopping** of the primary dam structure, which accounts for 34% of all dam failures, can occur due to inadequate spillway design, settlement of the dam crest, blockage of spillways, and other factors.
- **Foundation defects** due to differential settlement, slides, slope instability, uplift pressures, and foundation seepage can also cause dam failure. These account for 30% of all dam failures.
- Failure due to **piping**, or internal erosion caused by seepage, accounts for 20% of all failures. Piping occurs when seepage through a dam is not properly filtered and soil particles continue to progress and form sink holes within it. Seepage often occurs around hydraulic structures, such as spillways; through animal burrows; around roots of woody vegetation; and through cracks in dams, dam appurtenances, or dam foundations. (*Id.*)
- Failure due to **problems with conduits and valves**, typically caused by the intrusion of embankment material into conduits through joints or cracks, constitutes 10% of all failures.

3.3.3.1 Secondary & Compounding Hazards

The main secondary hazard posed by dam failure is rapid and severe downstream flooding, depending on the magnitude of the failure. Other potential secondary hazards of dam failure are landslides around the reservoir perimeter and bank erosion downstream.

Many historical dam failures have been secondary hazards triggered by other disasters, such as earthquakes, landslides, extreme storms, and sabotage. Poor construction, lack of maintenance and repair, and deficient operational procedures are preventable or correctable by a program of regular inspections; however, terrorism and vandalism are serious concerns that all operators of public facilities must plan for. These threats are under continuous review by public safety agencies. In Napa County, dam failure would most likely be a secondary hazard triggered by a major earthquake, excessive rainfall, or slope failure, which

are discussed in the Earthquake (Section 3.3.4), Severe Weather (Section 3.3.7), and Slope Failure (Section 3.3.5) Hazard Profiles.

Climate Change

Dams are designed partly based on assumptions about a river's flow behavior, expressed as hydrographs. As such, changes in weather patterns can have significant effects on the hydrograph used for the design of a dam. Although climate change will not increase the probability of catastrophic dam failure, it may increase the probability of design failures. If the hygrograph changes, then dam operators may be forced to release increased volumes earlier in a storm cycle to maintain required margins of safety, increasing flood potential downstream. Throughout the western United States, communities downstream of dams are already experiencing increases in-stream flows from early releases.

3.3.3.2 Policies, Plans & Regulatory Environment

Federal Regulatory Environment

National Dam Safety Act & Dam Safety Program

The potential for catastrophic flooding due to dam failures led to passage of the 1972 National Dam Safety Act. (Public Law 92-367) Then, following a series of deadly dam failures between 1972 and 1977, President Jimmy Carter directed the U.S. Army Corps of Engineers to inspect non-federal, high-hazard dams around the nation. The findings of these inspections helped establish dam safety programs in most states, and, ultimately, resulted in the creation of the National Dam Safety Program. (*Id.*)

The National Dam Safety Program requires a periodic engineering analysis of every major dam in the country. The goal of this program, monitored by FEMA, is to identify and mitigate the risk of dam failure to protect lives and property.

U.S. Army Corps of Engineers (USACE)

Under the National Dam Safety Program, the U.S. Army Corps of Engineers (USACE) is responsible for safety inspections of some federal and non-federal dams in the United States that meet the size and storage limitations specified in the National Dam Safety Act. USACE has inventoried such dams and surveyed each state and federal agency's capabilities, practices, and regulations regarding design, construction, operation, and maintenance of the dams. USACE also develops guidelines for inspection and evaluation of dam safety.

USACE is also responsible for maintaining the National Inventory of Dams (NID) and works in close collaboration with dam regulating agencies, including FEMA and state agencies, to obtain accurate and complete information about dams in the database.

Federal Energy Regulatory Commission (FERC) Dam Safety Program

The Federal Energy Regulatory Commission (FERC) has the largest dam safety program in the United States. The FERC cooperates with a large number of federal and state agencies to ensure and promote dam safety and, more recently, homeland security. There are over 3,000 dams that are part of regulated hydroelectric projects in the FERC program. Two-thirds of these are more than 50 years old. As dams age, concern about their safety and integrity grows, so oversight and regular inspection are important. FERC staff inspects hydroelectric projects on an unscheduled basis to investigate:

- Potential dam safety problems;
- Complaints about constructing and operating a project;
- Safety concerns related to natural disasters; and
- Issues concerning compliance with the terms and conditions of a license.

Every five years, an independent consulting engineer, approved by the FERC, must inspect and evaluate projects with dams higher than 10 meters (32.8 feet), or with a total storage capacity of more than 2,000 acre-feet.

FERC staff monitors and evaluates seismic research in geographic areas where there are concerns about seismic activity. This information is applied in investigating and performing structural analyses of hydroelectric projects in these areas. FERC staff also evaluates the effects of potential and actual large floods on the safety of dams. During and following floods, FERC staff visits dams and licensed projects, determines the extent of damage, if any, and directs any necessary studies or remedial measures the licensee must undertake. The FERC publication *Engineering Guidelines for the Evaluation of Hydropower Projects* guides the FERC engineering staff and licensees in evaluating dam safety. The publication is frequently revised to reflect current information and methodologies.

The FERC requires licensees to prepare emergency action plans and conducts training sessions on how to develop and test these plans. The plans outline an early warning system if there is an actual or potential sudden release of water from a dam due to failure. The plans include operational procedures that may be used, such as reducing reservoir levels and reducing downstream flows, as well as procedures for notifying affected residents and agencies responsible for emergency management. These plans are frequently updated and tested to ensure that everyone knows what to do in emergency situations.

Monticello Dam is a federal facility owned and operated by the U.S. Bureau of Reclamation and serves multiple purposes, including water supply, flood control, and recreation. While the dam itself is not regulated by the Federal Energy Regulatory Commission (FERC), it is important to note that the hydroelectric powerplant located at the base of the dam operates under a separate regulatory framework.

The Monticello Dam Powerplant is an approximately 11.5-megawatt facility constructed in 1983 under a FERC license. Although the Bureau of Reclamation owns the dam structure, the powerplant is owned, operated, and maintained by the Solano Irrigation District (SID) under this license. The current FERC license

for the hydroelectric facility is set to expire on December 31, 2030, at which time relicensing or other regulatory actions will be required.

This distinction is important for hazard mitigation planning purposes, as regulatory oversight differs between the dam structure and the associated power generation facility. While inundation risk is tied to the structural integrity and operation of Monticello Dam under federal oversight, the powerplant component is subject to FERC regulation and licensing requirements, reflecting a shared but distinct operational and regulatory framework.

State Regulatory Environment

California Department of Water Resources (DWR), Division of Safety of Dams (DSOD)

The California Department of Water Resources (DWR) Division of Safety of Dams (DSOD) monitors the dam safety program at the state level. When a new dam is proposed, division staff inspects the site. DSOD reviews dam applications and building plans to ensure that the dam is designed to meet minimum requirements and that the design is appropriate for known geologic conditions. It also inspects construction to ensure that the work is done in accordance with the approved plans. Division staff inspects constructed dams on an annual basis to ensure they are performing as intended and are not developing problems. Roughly a third of these inspections include in-depth instrumentation reviews. DSOD periodically reviews the stability of dams and their major appurtenances in light of improved design approaches and requirements, as well as new findings regarding earthquake hazards and hydrologic estimates in California. (DWR, 2025)

California Senate Bill 92

Senate Bill 92 was signed into law in 2017 and provides new state requirements focused on dam safety. Specifically, it requires owners of significant and high hazard potential dams to submit inundation maps to the California DWR. After the map is approved, the dam owner must then submit an emergency action plan (EAP) to the California Office of Emergency Services (Cal OES). An EAP identifies the emergency notification protocols, response process, and responsibilities of the dam operator and other agencies should an incident occur. The plans also outline preparedness activities. EAPs must approved by Cal OES Dam Safety Planning Unit, and updated and resubmitted every 10 years and, in some cases, sooner. (CalOES, 2025)

California Senate Bill 854

Passed in 2018, Senate Bill 854 amended California Water Code Section 6161, clarifying requirements for dams with existing EAPs as of March 1, 2017. It stipulates that if the EAP lacked inundation maps for all critical appurtenant structures, dam owners must submit a schedule to the DSOD to complete these maps.

Local Regulatory Environment

Dam safety and inundation risk management in Napa County are guided by a combination of land use policies, emergency preparedness planning, and interagency coordination frameworks established in the Napa County General Plan and the County's Emergency Operations Plan (EOP). These regulatory and planning documents collectively support hazard mitigation, emergency response, and long-term resilience and dam safety.

Napa County General Plan

The Napa County General Plan Safety Element (August 2023) provides the primary policy framework for addressing dam failure hazards. The Safety Element identifies dam failure as a potentially high-consequence hazard characterized by rapid-onset flooding, limited warning time, and downstream impacts to people, infrastructure, and transportation systems. The General Plan incorporates several policies specifically relevant to dam failure risk:

- **Policy SAF-2.16:** Requires review of new development proposals related to dam failure inundation maps and allows the County to limit or deny development where necessary to protect life and property .
- **Policy SAF-2.17:** Requires dam operators to maintain and regularly update Emergency Action Plans (EAPs) for high- and significant-hazard dams, supporting warning and response capabilities.
- **Policy SAF-6.4:** Requires development proposals to be reviewed with reference to dam failure inundation maps to identify evacuation routes.
- **Policy SAF-6.5:** Establishes that dam and levee maintenance is the responsibility of the owner/operator, with the County supporting coordination to ensure proper maintenance and repairs.
- **Policy SAF-6.11:** Calls for improving risk assessments within the County to better understand and reduce hazard exposure.

Additional supporting policies reinforce evacuation planning and emergency access, including Policy SAF- 1.6 (development of intra-county evacuation routes) and Policy SAF-2.18 (prioritization of improvements to evacuation routes). These policies are consistent with California Government Code §65302(g) and AB 747 requirements for evacuation planning.

Collectively, these policies demonstrate an integrated approach that combines hazard mapping, land use regulation, infrastructure planning, and interagency coordination to reduce dam failure risk.

Napa County Emergency Operations Plan

The 2024 Napa County Emergency Operations Plan (EOP) provides the operational framework for preparedness, response, and recovery related to dam failure incidents and other hazards. The EOP adopts an all-hazards approach and incorporates the National Incident Management System (NIMS), Standardized Emergency Management System (SEMS), and Incident Command System (ICS) to ensure coordinated multi-agency response.

Dam failure is specifically addressed through hazard-specific annexes within the EOP structure, which define roles, responsibilities, and procedures for emergency response, including evacuation, warning, and resource coordination. The EOP establishes Napa County as the Operational Area responsible for coordinating information sharing, resource requests, and mutual aid among local jurisdictions, special districts, and state and federal partners. Key elements relevant to dam safety include:

- Emergency coordination and communication: The County's Emergency Operations Center (EOC) serves as the central coordination point for situational awareness, damage assessment, and resource deployment during dam-related incidents.
- Evacuation and warning systems: The EOP outlines alert and notification procedures, including mass notification systems and coordination with state and federal warning systems to support timely evacuation of at-risk populations.
- Multi-agency collaboration: The plan emphasizes coordination with dam owners/operators (e.g., Bureau of Reclamation, Solano Irrigation District), as well as regional, state, and federal agencies responsible for dam safety oversight.
- Whole community approach: The EOP incorporates coordination with schools, healthcare facilities, and community organizations to ensure inclusive and effective emergency response.

Together, the General Plan and EOP provide a complementary regulatory and operational framework that supports dam safety, risk reduction, and emergency preparedness in Napa County. These documents ensure that both long-term planning and real-time response capabilities are aligned to minimize risk to life, property, and critical infrastructure from potential dam failure events.

3.3.3.3 Location

Dam hazard classifications, or hazard potential classifications, are used to categorize dams based on the potential consequences of failure rather than the likelihood of failure. As defined in Table 3-22, dams are categorized as Low, Significant, or High Hazard depending on the potential for loss of life, economic damage, and environmental impacts. The California DSOD also includes an additional classification of "Extremely High" for facilities with particularly severe downstream consequences.

Table 3-22: Dam Hazard Potential Classifications

Hazard Potential Classification	Loss of Human Life	Economic, Environmental, Lifeline Losses
Low	None expected	Low and generally limited to owner
Significant	None expected	Yes
High	Probable; one or more expected	Yes (but not necessary for this classification)
Extremely High	One or more and inundating an area of 1,000+ population	Inundation of facilities or infrastructure, posing significant threat to public safety determined case-by-case by DSOD

Source: Federal Guidelines for Dam Safety, Hazard Potential Classification Systems for Dams, 2004; DSOD Jurisdictional Dams

According to the California DSOD and the National Inventory of Dams, Napa County contains over 50 jurisdictional dams, the majority of which are classified as High Hazard Potential (Table 3-23), indicating that failure could result in probable loss of life and significant property damage . These dams are owned and operated by a mix of entities, including local jurisdictions (e.g., City of Napa, City of St. Helena, City of Vallejo), state agencies (e.g., California Department of Veterans Affairs), federal agencies (e.g., U.S. Bureau of Reclamation), water companies, and numerous private landowners and vineyard operators. This diverse ownership structure requires coordinated oversight between DSOD, federal regulators, and local emergency management agencies.

Reservoir capacities range from small agricultural impoundments of less than 50 acre-feet to major regional facilities such as Monticello Dam, which exceeds 1.9 million acre-feet and represents the largest storage facility in the county. Many dams were constructed between the late 1800s and mid-20th century, reflecting a system that includes both aging infrastructure and more recently constructed facilities.

Areas of Napa County most susceptible to dam failure inundation are concentrated along the Napa River corridor and its tributaries, including developed areas within the Cities of Calistoga, St. Helena, Yountville, and Napa, where downstream flow paths converge and population exposure is greatest.

Table 3-23: Dams in or Adjacent to Napa County

Dam Name	Owner	River or Stream	Year Completed	Storage (Acre-Ft)	Hazard Classification	Condition Assessment
Lake Curry	City of Vallejo	Gordon Valley Cr	1926	10,700	**High**	**Poor**
Peju Reservoir No. 2	Persephone Ranch Ltd. And Peju Province Winery	Burton Creek		96	**High**	**Poor**
St. Helena Ler	City of Saint Helena	Tr Napa River	1878	210	**High**	**Poor**

Dam Name	Owner	River or Stream	Year Completed	Storage (Acre-Ft)	Hazard Classification	Condition Assessment
Araujo Reservoir No. 1	Kerwin Estate, LLC	Unnamed	1950	21.9	**High**	**Fair**
Araujo Reservoir No. 2	Kerwin Estate, LLC		1950	19.8	**High**	**Fair**
Bell Canyon	City of Saint Helena	Bell Creek	1959	2530	**High**	**Fair**
Conn Creek	City of Napa	Conn Creek	1946	31,000	**High**	**Fair**
Hestan Vineyards Dam	Stanley Cheng			146	**High**	**Fair**
Veterans Home	California Department of Veteran Affairs	Tr Napa River	1908	39	**High**	**Fair**
Angwin	Pacific Union College	Moore Creek	1967	156	**High**	**Satisfactory**
B. J. Robinson	Massimo De Simoni	Tulocay Creek	1957	49	**High**	**Satisfactory**
Blanchard-Offner	Jim Collins	Tr Pope Creek	1963	274	**High**	**Satisfactory**
Circle S	Circle R Ranch LLC	Tr Milliken Cr	1979	131	**High**	**Satisfactory**
Crystal	Glendale Ranch Vineyards	Tr Crystal Crk	1952	105	**High**	**Satisfactory**
Deer Lake	Howell Mountain Mutual Water Company	Tr Angwin Creek	1958	248	**High**	**Satisfactory**
Duvall	Jim Collins	Tr Pope Creek	1940	242	**High**	**Satisfactory**
Eaton H. Magoon Lake	Langtry Farms, LLC	Routan Creek	1965	3,760	**High**	**Satisfactory**
Foss Valley	Atlas Peak Vineyards	Tr Milliken Cr	1988	800	**High**	**Satisfactory**
Heitz	Heitz Wine Cellars	Tr Pope Creek	1991	272	**High**	**Satisfactory**
Henne	Howell Mountain Mutual Water Company	Angwin Stream	1959	109	**High**	**Satisfactory**
Kimball Creek	City of Calistoga	Kimball Creek	1939	405	**High**	**Satisfactory**
Lake Camille	Department of State Hospitals-Napa	Tr Tulucay Cr	1880	42.9	**High**	**Satisfactory**
Lake Cynthia	Krupp Brothers Vineyard	Tr Soda Creek	1955	92	**High**	**Satisfactory**
Lake Leticia	William E. Jarvis	Tr Milliken Cr	1960	115	**High**	**Satisfactory**
Lake Marie	County of Napa	Tr Tulucay Cr	1908	170	**High**	**Satisfactory**
Lake William	William E. Jarvis	Tr Milliken Cr	1960	340	**High**	**Satisfactory**
Maxville	Maxville Lake Winery	Maxwell Creek	1953	183	**High**	**Satisfactory**
Metcalf	Skalli Corporation	Tr Maxwell Cr	1974	1,045	**High**	**Satisfactory**

Dam Name	Owner	River or Stream	Year Completed	Storage (Acre-Ft)	Hazard Classification	Condition Assessment
Milliken	City of Napa	Milliken Creek	1924	1,980	**High**	**Satisfactory**
Olson	Precision Vineyards, LLC	Ledgewood Creek	1955	200	**High**	**Satisfactory**
Orville	Howell Mountain Mutual Water Company	Angwin Creek	1959	89	**High**	**Satisfactory**
Rector Creek	California Department of Veteran Affairs	Rector Creek	1946	4,587	**High**	**Satisfactory**
Robert L. Matheson	Sage Canyon, LLC	Elder Creek	1954	90	**High**	**Satisfactory**
Turkey Ranch	Juliana Mutual Water Company	Tr Pope Creek	1999	240	**High**	**Satisfactory**
Usibelli No. 2	Usibelli Coal Mine, Inc.	Tr Maxwell Cr	1973	900	**High**	**Satisfactory**
Will Lake #1	C. Mondavi and Son, Inc.	Tr Napa River	2004	89	**High**	**Satisfactory**
Winery Lake	Rene Di Rosa	Tr Carneros Creek	1953	310	**High**	**Satisfactory**
Monticello Dam	Bureau Of Reclamation	PUTAH CREEK	1957	1,902,086	**High**	**Not Available**
Bassett Brown	Brown Estate Vineyards	Sage Creek	1990	16.41	**Significant**	**Fair**
Hudson Vineyards	Hudson Vineyards	Tr Huichica Crk	1983	74.12	**Significant**	**Fair**
Burns	Buckman Vineyards LLC	Tri Swartz Cr	1956	62	**Significant**	**Satisfactory**
Davis	Temple Family Vineyards, LLC	Tr Pope Creek	1955	140	**Significant**	**Satisfactory**
Dick Week	Juliana Mutual Water Company	Tr Pope Creek	1955	3,140	**Significant**	**Satisfactory**
Hardester North	Juliana Mutual Water Company	Tr Burton Crrek	2003	150	**Significant**	**Satisfactory**
Jameson Vineyards	John Anthony Family of Wines Napa Valley LLC	Tr Fagan Creek		75	**Significant**	**Satisfactory**
Lake La Verne	Clinton and Nancy Pridmore	Tr Capell Creek	1956	54	**Significant**	**Satisfactory**
Linda Vista	Elizabeth C. Williamson	Tr Chiles Creek	1959	52	**Significant**	**Satisfactory**
Naz Lake	Huneeus-Chantre Properties	Tr Napa River	1955	150	**Significant**	**Satisfactory**

Dam Name	Owner	River or Stream	Year Completed	Storage (Acre-Ft)	Hazard Classification	Condition Assessment
Scotts Canyon	Stephen Juelsgaard	Tr Carneros Creek	1948	58	**Significant**	**Satisfactory**
Veeder Hills Dam	The Hess Persson Estates	Pickle Canyon Creek		23.9	**Significant**	**Satisfactory**
Deer Creek	Juliana Mutual Water Company	Tr Pope Creek	1980	103	**Low**	**Satisfactory**
La Herradura	L.P.R.P. Legacy Trust	Tr Conn Creek	1948	110	**Low**	**Satisfactory**
Ler Twin Lake	Juliana Mutual Water Company	Tr Pope Creek	1985	127	**Low**	**Satisfactory**
Long Valley West No. 2	Juliana Mutual Water Company	Tr Pope Creek	1982	177	**Low**	**Satisfactory**
Montana Lake	Terrence Wilson	Tr Lake Curry	2009	150	**Low**	**Satisfactory**
Morgan	William and Barbara Morgan	Tr Gordon Val Cr		94	**Low**	**Satisfactory**
Moskowite	George Moskowite	Tr Capell Creek	1955	472	**Low**	**Satisfactory**
Napa Valley Lake	Langtry Farms, LLC	Tr Putah Creek	1990	200	**Low**	**Satisfactory**
Upper Twin Lake	Juliana Mutual Water Company	Tr Pope Creek	1987	63	**Low**	**Satisfactory**

Source: National Inventory of Dams

Hazard Classification and Tributary-Based Risk Patterns

Dam hazard classifications reflect the consequences of failure rather than likelihood, with High Hazard dams posing the greatest potential risk to life safety. A review of Napa County's dam inventory indicates several notable concentrations of High Hazard dams within shared tributary systems, which may increase cumulative downstream risk during extreme events or cascading failures.

- **Pope Creek Watershed Cluster:** One of the most significant concentrations of dams occurs along tributaries to Pope Creek, where multiple High Hazard dams—including Blanchard-Offner, Duvall, Heitz, and Turkey Ranch—are located within the same drainage system. This clustering, combined with several additional Significant hazard dams (e.g., Dick Week, Davis), suggests the potential for cascading impacts that could affect downstream areas connected to Lake Berryessa and ultimately the Napa River system.
- **Milliken Creek Watershed Cluster:** Another concentration of High Hazard dams is present along Milliken Creek and its tributaries, including Circle S, Foss Valley, Lake Leticia, and Lake William, as well as the larger Milliken Dam operated by the City of Napa. This watershed drains directly into the Napa River near the City of Napa, indicating a direct pathway for downstream flooding impacts affecting urbanized areas and critical infrastructure.

- **Napa River Tributary Cluster:** Several High Hazard dams are located directly on or adjacent to tributaries of the Napa River, including St. Helena Ler, Veterans Home, and Will Lake #1, as well as Significant hazard facilities such as Naz Lake. These upstream facilities have the potential to contribute to localized flood surges that could propagate downstream through the Napa Valley floor.
- **Putah Creek / Lake Berryessa System:** The Monticello Dam, located on Putah Creek, represents the most regionally significant facility affecting Napa County. Its High Hazard classification reflects the extreme consequences of a failure scenario, although the facility is subject to federal oversight and rigorous safety standards.
- **Additional Localized Clusters:** Other smaller groupings of High Hazard dams occur along Tulucay Creek (Lake Camille, Lake Marie) and Maxwell Creek (Maxville, Metcalf, Usibelli No. 2), where multiple facilities within the same drainage could contribute to compounded downstream effects.

The presence of multiple High Hazard dams within shared tributary systems highlights the importance of considering cumulative and cascading failure scenarios in hazard mitigation planning. While individual dam failures are rare, the spatial clustering of dams—particularly within the Pope Creek and Milliken Creek watersheds—introduces the potential for compound flood waves, reduced warning times, and increased downstream exposure.

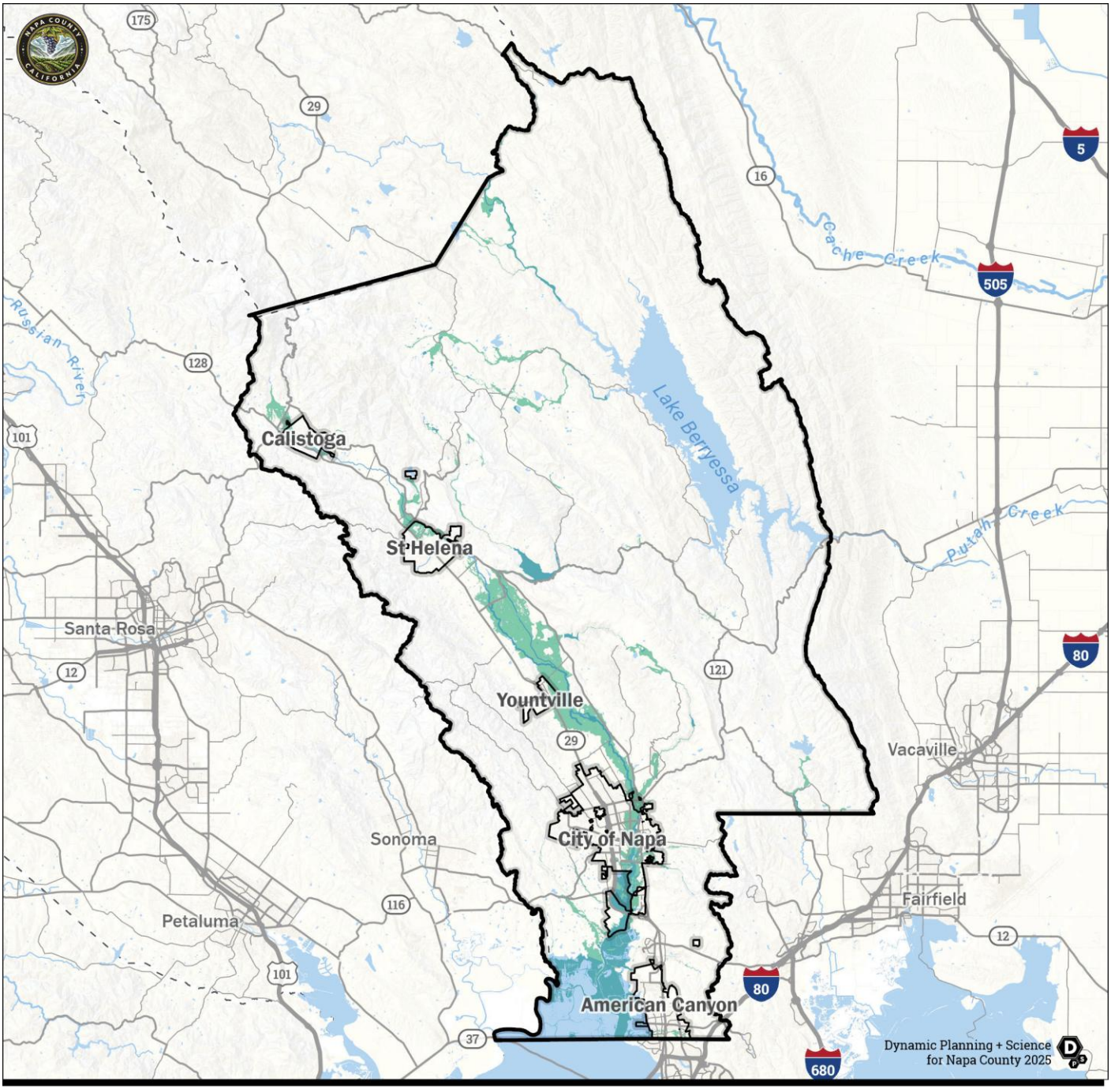


Figure 3-23: Napa County Dam Failure Risk Map

3.3.3.4 Past Events

No dams have failed in Napa County to date. As the risk assessment for Napa County illustrates, the chances of a dam failure area low, but the consequences of such are quite severe.

The most recent concerning dam failure in California was the 2017 collapse of a spillway on the Oroville Dam in Butte County, California. Oroville Dam is the largest facility within the State Water Project in California; the dam stores 3.5-million-acre feet of water, and serves as important flood control for the Feather River. In 2017, after substantial runoff from the Sierra Nevadas, Lake Oroville was full and the spillway was opened to release extra water downstream. "Spillways" are dam safety features that allow water to overtop the dam if the reservoir fills too quickly. Spillway overflow events, often referred to as "design failures," result in increased discharges downstream and increased flooding potential.

The force of the release gouged a large crater in the concrete spillway and required the California Department of Water Resources (DWR) to halt water releases via that conduit. The high lake level then created fear that erosion would compromise the integrity of the auxiliary spillway and flood the city of Oroville and surrounding communities. Thousands were evacuated, and eventually runoff receded without further issue. Ultimately, an independent analysis concluded that poor design and construction and inadequate state oversight contributed to the collapse of the concrete spillway. (Water Education Foundation, 2020)



Figure 3-24. Oroville Dam Spillway after 2017 failure.

Source: https://www.watereducation.org/aquapedia/oroville-dam

The Oroville Dam spillway failure triggered inspection of 93 dam spillways across California through the new Spillway Re-evaluation Program, including three in Napa County: Conn Creek, Bell Canyon, Lake Curry, and Rector Creek dams. (Cal. Dep't of Water Resources, 2019)

3.3.3.5 Frequency & Probability of Future Occurrences

Dams are constructed with engineered safety features, including spillways, that are designed to safely convey excess water when reservoir levels exceed storage capacity. Spillway overflow events, sometimes referred to as "design exceedance" events, can result in elevated downstream flows and increased flooding potential. The residual risk associated with dams reflects the possibility that an event exceeds design standards or that structural or operational failures occur despite safeguards. In modern regulatory environments, including oversight by the California DSOD and federal agencies, the overall probability of

dam failure remains low. Failures are most often associated with extreme or compound events such as earthquakes, landslides, or unusually intense rainfall and runoff.

Currently available information indicates that the overall probability of dam failure in Napa County is low (generally less than 1% annual probability); however, this probability is not uniform across all facilities. The likelihood of failure is influenced by several key factors, including dam condition, age, design, maintenance practices, and hazard potential classification. While hazard classification reflects the consequences of failure rather than failure likelihood, dams classified as High Hazard Potential often receive increased regulatory scrutiny due to the severe consequences associated with failure. At the same time, condition assessments (e.g., Fair or Poor) provide important insight into structural integrity and operational reliability. Dams in Poor condition, particularly those classified as High Hazard, may present a relatively elevated probability of failure compared to well-maintained facilities, especially under stress from extreme hydrologic or seismic events.

As shown in Table 3-23, Napa County contains several dams where high hazard classification coincides with Fair or Poor condition ratings. This combination represents a higher-priority concern for risk management and emergency planning, as these facilities may be more susceptible to performance issues during extreme events. For example, dams such as Lake Curry, Peju Reservoir No. 2, and St. Helena Ler are classified as High Hazard and Poor condition, indicating both significant downstream consequences and potential structural or maintenance deficiencies. Additional dams, including Araujo Reservoir No. 1 and No. 2, Bell Canyon, Conn Creek, Hestan Vineyards Dam, and Veterans Home, are classified as High Hazard with Fair condition, suggesting that while they are currently functional, continued monitoring, maintenance, and potential upgrades are necessary to ensure long-term reliability.

Although the dam failure risk assessment for Napa County illustrates that the chances of a failure are low, the consequences are quite severe. Given the monitoring protocols at all the dams within and adjacent to the county with significant or high-hazard potential, the probability of dam failure in Napa County is unlikely (less than 1% annual probability).

3.3.3.6 Severity

Even though the probability of dam failure in Napa County is low, the potential consequences are severe to catastrophic, particularly for areas located downstream of large-capacity reservoirs and dams situated near populated areas. The severity of a dam failure event is strongly influenced by the volume of stored water, proximity to developed areas, and downstream channel characteristics, all of which affect the magnitude and speed of inundation.

Within Napa County, the most significant risk is associated with larger impoundments located upstream of populated areas, including facilities such as Monticello Dam (Lake Berryessa), Conn Creek Dam (Lake Hennessey), and Lake Curry Dam. These dams store substantial water volumes and are hydraulically connected to downstream waterways that flow through or toward developed areas, including the Napa Valley floor and incorporated jurisdictions such as the Cities of Napa, St. Helena, Yountville, and Calistoga.

A failure at one of these facilities could result in rapid-onset flooding, limited warning time, and widespread impacts to life safety, property, and critical infrastructure.

3.3.3.7 Warning Time

Warning time for dam failure depends on the cause of failure. In an event of extreme precipitation, such as during an atmospheric river event, evacuations can be planned with sufficient time, but in the event of a structural failure due to earthquake, there may be no warning time. A dam's structural type also affects warning time.

Earthen dams do not tend to fail instantaneously. Once a breach is initiated, discharging water erodes the breach until the reservoir water is depleted, or the breach resists further erosion. Concrete gravity dams also tend to have an initial partial breach. The time of breach formation ranges from a few minutes to a few hours. Several participating jurisdictions have established protocols in their emergency operations plans for warning and response to imminent dam failure. These protocols are tied to emergency action plans (EPA) created by the dam owner.

EAPs identify areas downstream from dams requiring warning and evacuation in the event of a failure. Documented cases have demonstrated that warning and evacuation time for EAPs can dramatically influence the loss of life, varying from 0.02% of the threatened population when the warning time is 90 minutes or more, to 50% when there is less than 15 minutes of warning. (Graham, 1988)

Dam failure inundation mapping studies usually assume one of two scenarios:

- Flows from a dam failure during "fair weather" or "sunny day" conditions with the reservoir at the normal pool level and receiving normal inflow (usually insignificant). A fair weather failure is generally considered to have the most potential for loss of human life, primarily due to the element of surprise.
- Flows from a dam failure during flood conditions or the inflow design flood. Failure during flood conditions is considered to show the upper limit of inundation and to have less potential for loss of human life because the operators and downstream population are on alert. However, the flood conditions scenario is used less frequently because of the expense in additional watershed and spillway analysis.

Inundation mapping shows a continuous line of inundation identifying the area potentially at risk. It starts at the dam and continues downstream to a point where the breach flood no longer poses a risk to life or property, such as a large river or reservoir with the capacity of storing the flood waters. The domino effect of a dam failure causing failures of any downstream dams is studied on a case-by-case basis.

EAPs are not publicly available but are on file with local emergency management agencies. Information provided on flooding conditions at downstream locations includes: distance downstream; arrival time of the leading edge of the breach flood wave; peak flow depth, incremental rise, or water surface elevation (as appropriate); and peak velocity.

3.3.3.8 Dam Failure Vulnerability Assessment

The primary danger associated with dam failure is high-velocity flooding downstream of the dam and limited warning times for evacuation. Vulnerability varies by community and depends on the particular dam and stream profiles, and the nature and extent of the failure. A summary of dam failure risk exposure in Napa County to people, property, and critical facilities and infrastructure is provided in Figure 3-25.

3.3.3.8.1 Population

The potential for loss of life resulting from a dam failure in Napa County is influenced by the volume of water impounded, proximity of downstream populations, warning time, and the availability and capacity of evacuation routes. While the probability of dam failure remains low, all populations located within mapped dam inundation areas are considered exposed to risk, particularly where large-capacity dams are hydraulically connected to developed areas.

As illustrated in Figure 3-25 and summarized in Table 3-24, a notable portion of the County's population is located within dam inundation zones, with exposure concentrated along the Napa Valley floor where development is densest.

Population exposure is not evenly distributed across all dams, but is instead concentrated downstream of a limited number of higher-capacity facilities. In particular, Conn Creek Dam represents the most significant population exposure, accounting for the largest share of residents within a single inundation area. Additional dams with comparatively high population exposure include Rector Creek, Summit Reservoir, Lake Marie, Milliken Dam, and Bell Canyon Dam, all of which are located upstream of or adjacent to developed portions of the Napa Valley corridor. These dams are hydraulically connected to areas with higher population density, increasing the potential life safety risk in the event of a failure.

In contrast, many smaller dams—particularly those located in rural or upland areas—have relatively limited population exposure, often affecting only small numbers of residents. However, even these facilities may pose localized risks, particularly where evacuation routes are constrained or warning times are limited.

Disproportionately Impacted Populations

Certain populations within inundation zones may be disproportionately vulnerable during a dam failure event. These include children, elderly individuals, and persons with access and functional needs, particularly those who may require assistance to evacuate. In addition, individuals with limited English proficiency, limited access to transportation, or reduced access to emergency alert systems may face increased challenges in receiving warnings and responding effectively. Schools, care facilities, and other community-serving institutions located within inundation areas require coordinated emergency planning, communication systems, and evacuation procedures to ensure life safety.

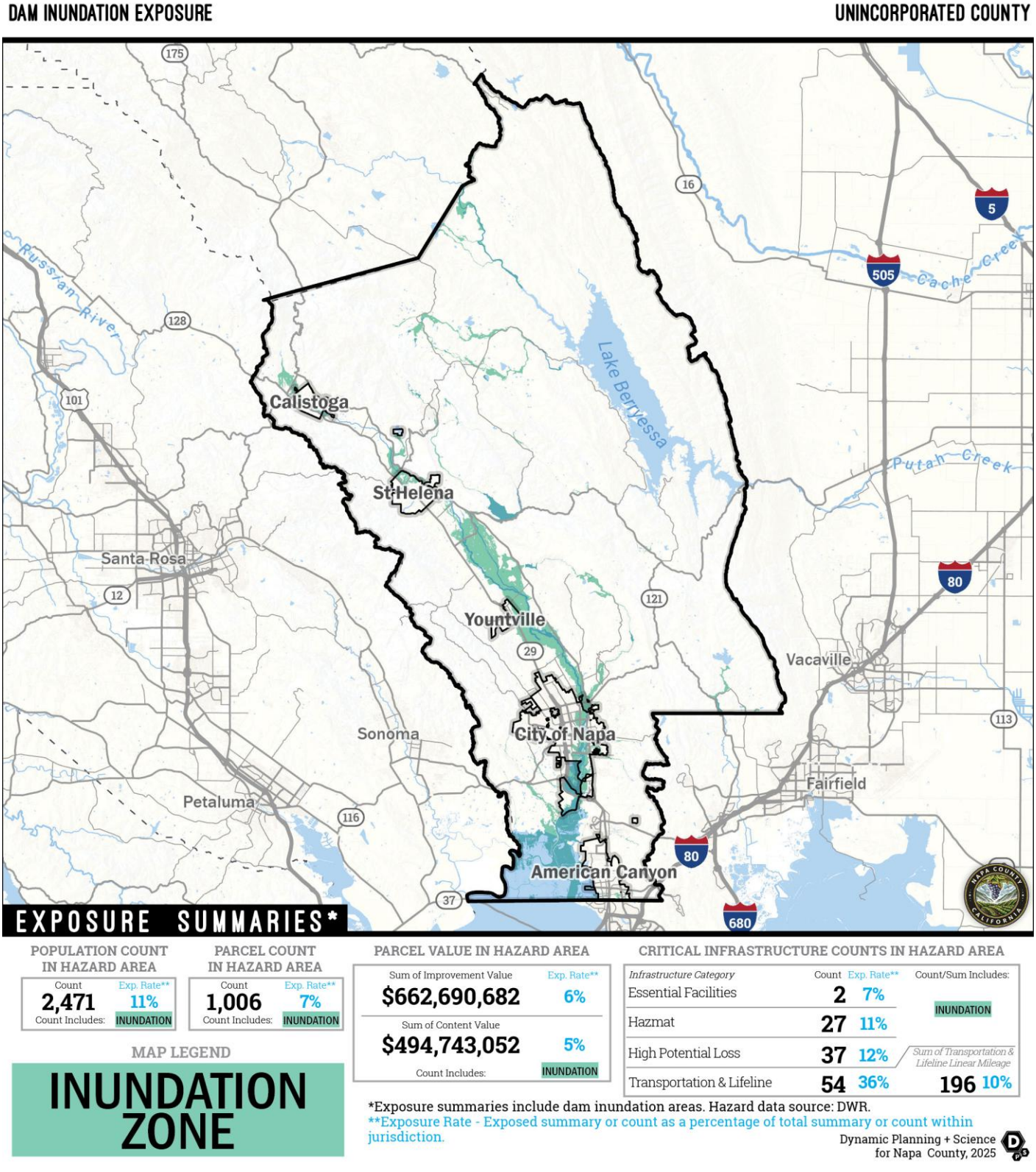


Figure 3-25: Exposure Summary – Napa County Dam Failure Risk

Table 3-24: Napa County Population Exposure to Dam Failure

Dam Inundation Zone	Population Count	% of Total
Angwin	57	*0.04%*
Araujo Reservoir 1	2	*0.00%*
Araujo Reservoir 2	2	*0.00%*
B J Robinson	304	*0.22%*
Bell Canyon	1,848	*1.35%*
Blanchard	4	*0.00%*
Burns	1	*0.00%*
Circle S	10	*0.01%*
Conn Creek	15,136	*11.02%*
Deer Lake	36	*0.03%*
Dick Week	1	*0.00%*
Duvall	3	*0.00%*
Eaton H Magoon Lake	1	*0.00%*
Foss Valley	15	*0.01%*
Guenoc Lake	1	*0.00%*
Heitz	6	*0.00%*
Henne	47	*0.03%*
Homestake Tailings	4	*0.00%*
Hudson Vineyards	1	*0.00%*
Jamieson Vineyards	19	*0.01%*
Kimball Creek	818	*0.60%*
Lake Camille	910	*0.66%*
Lake Curry	3	*0.00%*
Lake Cynthia	80	*0.06%*
Lake La Verne	1	*0.00%*
Lake Marie	2,262	*1.65%*
Linda Vista	1	*0.00%*
Milliken	2,012	*1.46%*
Naz Lake	7	*0.01%*
Orville	12	*0.01%*
Rector Creek	2,546	*1.85%*
Scotts Canyon	2	*0.00%*
St Helena Lower	404	*0.29%*

Dam Inundation Zone	Population Count	% of Total
Summit Reservoir	2,277	*1.66%*
Turkey Ranch	3	*0.00%*
Usibelli No 2	1	*0.00%*
Veeder Hills Dam	60	*0.04%*
Veterans Home	68	*0.05%*
Willow Lake 1	39	*0.03%*
Wine Lake	139	*0.10%*
Total*	**2,471**	**11.00%**

**Total population is not equal to sum of all dam inundation zones due to dissolved overlapping inundation areas.*

3.3.3.8.2 Property

Vulnerable properties include those located within or immediately adjacent to dam inundation areas, where flood depths and velocities would be greatest. These areas would experience the most destructive impacts from a dam failure, including structural damage, foundation failure, and loss of access. Properties located in low-lying areas along stream corridors and the Napa River floodplain are particularly susceptible, as these areas tend to concentrate floodwaters during an inundation event.

As summarized in Table 3-25, approximately 1,006 parcels (7.4% of all unincorporated parcels) are located within dam inundation areas. These parcels represent a combined exposure value of approximately $1.16 billion, including both structural (market value) and content value. This indicates that while a relatively small percentage of parcels are exposed, the total economic value at risk is substantial, reflecting the presence of higher-value residential, agricultural, and estate properties within the Napa Valley.

Similar to population exposure, property risk is highly concentrated downstream of a limited number of dams. The Conn Creek Dam inundation area accounts for the largest share of property exposure, with over $600 million in total value at risk, representing more than half of the total exposure within the unincorporated area. Additional dams with significant property exposure include Milliken Dam (approximately $269 million), Bell Canyon Dam (over $100 million), and Rector Creek (approximately $69 million). These facilities are located upstream of or adjacent to developed portions of the Napa Valley corridor, where property values and development intensity are highest.

In contrast, many smaller dams, particularly those located in rural or upland areas, are associated with minimal property exposure, often affecting only a small number of parcels with comparatively lower total value. However, localized impacts may still be significant for affected landowners, particularly where access routes, agricultural operations, or critical utilities are disrupted.

It is also important to note that overlapping inundation areas between dams may result in cumulative exposure that is not equal to the sum of individual dam totals. This highlights the importance of considering compound and cascading impacts, particularly in watersheds with multiple upstream facilities.

Table 3-25: Napa County Unincorporated Parcels Exposed to Dam Inundation Zones

	Total Parcels	Total Market Value ($)	Total Content Value ($)	Total Value ($)
Unincorporated County	13,668	$11,215,199,644	$9,248,691,039	$20,463,890,683

Dam Inundation Zone	Parcel Count	% of Total	Market Value Exposure ($)	Content Value Exposure ($)	Total Exposure ($)	% of Total
Angwin	3	0.0%	$9,852,564	$9,852,564	$19,705,127	0.1%
B J Robinson	21	0.2%	$9,113,700	$4,699,650	$13,813,350	0.1%
Bell Canyon	94	0.7%	$64,043,445	$39,879,150	$103,922,595	0.5%
Blanchard	2	0.0%	$515,911	$261,124	$777,035	0.0%
Conn Creek	438	3.2%	$335,128,769	$301,113,263	$636,242,031	3.1%
Deer Lake	18	0.1%	$5,982,193	$2,991,415	$8,973,608	0.0%
Duvall	2	0.0%	$515,911	$261,124	$777,035	0.0%
Eaton H Magoon Lake	2	0.0%	$1,030,200	$515,100	$1,545,300	0.0%
Foss Valley	1	0.0%	$1,003,850	$501,925	$1,505,775	0.0%
Heitz	2	0.0%	$515,911	$261,124	$777,035	0.0%
Henne	24	0.2%	$7,104,339	$3,552,490	$10,656,829	0.1%
Kimball Creek	33	0.2%	$19,309,936	$11,036,432	$30,346,368	0.1%
Lake Camille	7	0.1%	$3,005,176	$1,502,589	$4,507,765	0.0%
Lake Curry	23	0.2%	$16,723,654	$10,802,391	$27,526,045	0.1%
Lake La Verne	2	0.0%	$767,125	$383,563	$1,150,688	0.0%
Lake Marie	21	0.2%	$7,384,381	$3,692,192	$11,076,573	0.1%
Metcalf	2	0.0%	$2,367,998	$1,831,648	$4,199,646	0.0%
Milliken	324	2.4%	$177,005,495	$91,702,468	$268,707,963	1.3%
Orville	4	0.0%	$349,663	$175,148	$524,811	0.0%
Rector Creek	66	0.5%	$36,729,897	$32,415,192	$69,145,089	0.3%
Robert L Matheson	3	0.0%	$589,900	$589,900	$1,179,800	0.0%
Scotts Canyon	1	0.0%	$394,740	$394,740	$789,480	0.0%
Turkey Ranch	3	0.0%	$990,211	$735,423	$1,725,634	0.0%
Usibelli No 2	2	0.0%	$2,367,998	$1,831,648	$4,199,646	0.0%
Veeder Hills Dam	1	0.0%	$564,400	$282,200	$846,600	0.0%
Wine Lake	33	0.2%	$22,436,815	$15,209,690	$37,646,506	0.2%
Dam Inundation Area*	**1,006**	**7.4%**	**$662,690,682**	**$494,743,052**	**$1,157,433,734**	**5.7%**

**Totals are not equal to sum of all dam inundation zones due to dissolved overlapping inundation areas.*

3.3.3.8.3 Critical Facilities & Infrastructure

Critical facilities and infrastructure located within dam inundation areas in Napa County are vulnerable to severe damage or complete loss of function during a dam failure event. Facilities located in low-lying areas along the Napa River corridor and its tributaries are particularly susceptible due to the potential for high-velocity floodwaters and rapid inundation. While the overall number of critical facilities within mapped inundation zones is relatively limited, the presence of essential services and high-consequence assets within these areas presents a significant risk to emergency response and community recovery.

As summarized in Table 3-26, a total of 120 critical facility assets are located within dam inundation areas. These include essential facilities such as fire stations (2), as well as high potential loss facilities (37), hazardous materials sites (27), and other community-serving assets such as childcare centers, emergency shelters, and a mobile home park. In addition, 54 transportation and lifeline point assets—including bridges, airports, and wastewater infrastructure—are located within inundation zones. Although relatively few essential facilities are directly exposed, the presence of hazardous materials facilities and high potential loss sites introduces the potential for secondary impacts, including hazardous material releases, fire, or environmental contamination during a dam failure event.

Transportation and lifeline infrastructure are particularly vulnerable to dam failure impacts. As shown in Table 3-27, approximately 196 miles of linear infrastructure are located within inundation areas. This includes extensive roadway networks (over 130 miles of local streets and additional mileage across major, secondary, and service roads), as well as levees, railroads, natural gas pipelines, and electrical transmission lines. Damage to this infrastructure could result in significant disruptions to evacuation, emergency response, and regional mobility, particularly in areas where routes are limited by valley topography or where multiple systems converge.

The loss or impairment of critical infrastructure may also lead to cascading impacts, including power outages, communication failures, and reduced access to emergency services. For example, damage to bridges or key roadway segments could isolate communities or delay evacuation efforts, while impacts to utilities such as pipelines and transmission lines could complicate response and recovery operations.

Overall, while the number of exposed critical facilities in Napa County is relatively modest compared to other hazards, the strategic importance and interconnected nature of these assets—particularly within the Napa Valley corridor—elevates their significance in dam failure planning.

Table 3-26: Napa County Critical Facilities Exposure to Dam Failure

Critical Infrastructure - Dam Inundation	
Infrastructure Type	**Total Feature Count**
Essential Facilities	2
EOC	-
Fire Station	2
Hospital	-
Law Enforcement	-
High Potential Loss	37
Adult Residential Care	-
Child Care Center	1
Church	-
Communication Tower	-
Dam	6
Emergency Shelter	1
Farm Worker Housing	1
Historic Building	-
Library	-
Mobile Home Park	1
Res Elder Care Facility	1
Private School	-
Public School	-
Real Property Asset	26
Transportation and Lifeline	54
Airport	3
Bridge	50
Bus Stop	-
HMMWC Asset	-
HMMWC Dam	-
HMMWC Hydrant	-
NG Station	-
Power Plant	-
Substation	-
Wastewater Treatment Facility	1
Water Supply Intake	-
Water Tank	-
Water Treatment Facility	-

Critical Infrastructure - Dam Inundation	
Infrastructure Type	**Total Feature Count**
Hazmat	27
Geotracker Cleanup Site	1
HWTS Active Facility	26
Landfill	-
Grand Total	**120**

**Real Property Assets are digitized insurance rolls for demonstrating value and ownership and may have overlapping points with other categories such as fire stations and law enforcement.*

Table 3-27: Napa County Critical Infrastructure Exposure to Dam Failure

Critical Infrastructure - Dam Inundation	
Infrastructure Type (linear)	**Total Dam Exposure**
Levee	46.4
NG Pipeline	3.4
Railroad	4.0
Transmission Line	8.6
Street OSM	133.6
Highway & Interstate	-
Major Road	3.7
Residential Road	20.2
Road - Secondary	12.5
Road - Tertiary	10.9
Service Road	82.9
Unclassified	3.3
Grand Total	**196.0**

Miles of exposure

3.3.3.9 Development Trends

Flooding resulting from a dam failure event in Napa County has the potential to exceed mapped Special Flood Hazard Areas (SFHAs) regulated through local floodplain ordinances. As such, the County and participating jurisdictions should consider dam failure inundation zones in addition to FEMA floodplain maps when reviewing development proposals, particularly in areas located downstream of High and Significant Hazard dams. Land use decisions in these areas should account for the potential for rapid-onset, high-velocity flooding that may exceed typical regulatory flood protection standards.

While portions of Napa County remain rural, many dam inundation areas overlap with developed or developing areas along the Napa Valley floor, including incorporated jurisdictions and unincorporated

communities. As a result, future development, particularly infill and redevelopment within urbanized areas, may be exposed to dam failure risk, especially where it occurs downstream of major facilities such as Conn Creek, Milliken, and Rector Creek Dams. The County's growth management framework generally directs higher-density development toward existing urbanized areas with access to infrastructure; however, several of these areas are also located within or near mapped inundation zones.

Most areas susceptible to dam failure impacts overlap with mapped flood hazard zones along the Napa River and its tributaries. Consequently, existing floodplain management policies—such as requirements for elevation, setbacks, and floodproofing—provide a baseline level of protection for new development. However, dam failure events can produce flooding conditions that exceed the 1-percent annual chance (100-year) flood standard, which forms the basis for most regulatory requirements. Therefore, reliance solely on floodplain regulations may not fully address the risks associated with dam failure.

Incorporating dam inundation mapping into land use planning and development review processes would enhance risk reduction by ensuring that site design, access, and emergency planning consider worst-case flooding scenarios. This is particularly important for critical facilities, high-occupancy uses, and vulnerable populations located within inundation areas. Additionally, as development occurs downstream of existing dams, hazard classifications may change over time, with Low Hazard dams potentially being reclassified as Significant or High Hazard due to increased downstream consequences.

Overall, integrating dam failure considerations into planning, permitting, and capital improvement decisions represents an important opportunity to reduce long-term risk in Napa County, particularly in areas where flood and dam inundation hazards overlap.

3.3.3.10 Climate Change Impacts

Dam failure is a low-probability but high-consequence hazard in Napa County, with climate change expected to increase stress on dam systems and downstream environments, potentially influencing both the likelihood and consequences of failure. Projected increases in extreme precipitation, atmospheric river events, and runoff variability are expected to result in higher reservoir levels, more frequent spillway use, and increased hydraulic loading on dam infrastructure. In addition, more intense storm events occurring after prolonged dry periods may increase erosion, sedimentation, and debris loading, placing additional strain on both dams and downstream conveyance systems. These conditions may exacerbate risks associated with aging infrastructure and dams in fair or poor condition, while also increasing the potential for cascading impacts in watersheds with multiple upstream facilities.

Vulnerable Populations & At-Risk Facilities

Several populations in Napa County face elevated risk from dam failure due to their location within inundation zones and limited capacity to respond to rapid-onset flooding. As identified in the dam failure exposure analysis, a notable portion of the County's population resides within mapped inundation areas,

particularly along the Napa Valley floor downstream of major facilities such as Conn Creek and Milliken Dams.

Vulnerable populations include children, elderly individuals, and persons with access and functional needs, particularly those who may require assistance evacuating within limited warning timeframes. Schools, childcare facilities, and community-serving institutions located within or near inundation zones are of particular concern due to the need for coordinated evacuation and communication procedures. In addition, individuals with limited English proficiency, limited transportation access, or reduced access to emergency alerts may face additional barriers in receiving warnings and taking protective action.

Hazardous materials facilities and high potential loss sites located within inundation areas present an additional layer of risk. Damage to these facilities during a dam failure event could result in secondary impacts, including hazardous material releases, environmental contamination, and fire hazards, further affecting nearby populations.

Infrastructure & Access Constraints

Dam failure would likely result in significant disruption to transportation and lifeline infrastructure, particularly within the Napa Valley corridor where infrastructure networks are concentrated. Roads, bridges, and key evacuation routes located within inundation zones are vulnerable to rapid flooding, erosion, and structural damage, which may limit evacuation capacity and delay emergency response.

As identified in the risk assessment, a substantial extent of transportation and utility infrastructure, including roads, pipelines, and transmission lines, is located within dam inundation areas. Damage to these systems could result in cascading impacts, including power outages, communication failures, and restricted access to critical services. These impacts are particularly concerning in areas where limited ingress and egress routes already constrain evacuation options, increasing overall life safety risk.

Systemic & Planning Challenges

Dam failure risk in Napa County is influenced by a combination of aging infrastructure, evolving land use patterns, and regulatory limitations. While dam safety is regulated by state and federal agencies, local jurisdictions play a key role in land use planning, emergency preparedness, and downstream risk reduction.

Current floodplain regulations provide a baseline level of protection; however, dam failure events may exceed regulatory flood standards, including the 1-percent annual chance flood. As a result, reliance solely on floodplain management tools may not fully address dam-related risks. In addition, continued development downstream of existing dams may increase hazard classifications over time, elevating both exposure and regulatory requirements.

Public awareness of dam failure risk is also limited compared to more frequent hazards, which may reduce preparedness and response effectiveness. Increased outreach and education are needed to ensure that residents understand inundation risk, evacuation procedures, and available warning systems.

Climate Change Trends

Climate change is expected to influence dam safety risk through increased hydrologic variability and more extreme weather conditions. More frequent and intense atmospheric river events may lead to higher peak reservoir levels and increased spillway usage, while prolonged drought conditions followed by intense storms may contribute to soil instability and increased sediment transport.

These changing conditions may also increase the likelihood of compound hazard events, such as flooding coinciding with dam stress or infrastructure failure. In watersheds with multiple dams, these dynamics may elevate the potential for cascading or sequential failures, particularly where facilities are located along shared tributaries.

Future Considerations & Mitigation Direction

Addressing dam failure risk under changing conditions will require a coordinated, multi-agency approach that prioritizes vulnerable populations, critical facilities, and high-consequence dams. Key considerations include:

- Enhancing early warning systems and Emergency Action Plan (EAP) coordination with dam operators
- Improving evacuation planning and route capacity, particularly in high-exposure areas
- Incorporating dam inundation mapping into land use and development review processes
- Prioritizing inspection, maintenance, and rehabilitation of dams in fair or poor condition
- Expanding public outreach and education, particularly for underserved and at-risk populations
- Evaluating cascading and compound risk scenarios in watershed-scale planning efforts

By aligning mitigation strategies with identified dam failure problem statements, Napa County can reduce life safety risk, minimize economic impacts, and enhance resilience to climate-driven stressors affecting dam systems and downstream communities.

3.3.3.11 Dam Failure Hazard Problem Statements

As part of the mitigation action identification process, the Napa County Planning Team developed areas of concern (i.e., problem statements) that summarize the county's most pressing dam failure-related vulnerabilities and challenges. The problem statements were developed based on the updated risk assessment and vulnerability analysis contained herein, as well as the team's local knowledge and experience and community input. The problem statements address a broad spectrum of concerns, from direct impacts on residents and vulnerable populations to threats to critical infrastructure and long-term recovery.

These problem statements are not intended to be all-encompassing or to describe each and every issue associated with dam failure hazards. Instead, they highlight the most urgent concerns that can be addressed within the scope of this MJHMP. Each statement will be linked to at least one mitigation action, ensuring

that identified needs are met with specific, measurable, and equitable solutions. Table 3-28 presents the dam failure problem statements for Napa County, along with their associated areas of concern and reference numbers for cross-linking to the mitigation actions in Table 4-4.

Table 3-28: Napa County Dam Failure Hazard Problem Statements

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-DF-NCo-25	Dam Failure	Threat	**Napa County**	Approximately 120 critical facilities and 200 miles of transportation and lifeline infrastructure are located within dam inundation zones, including essential facilities, roads, bridges, water and sewer pipelines, and hazardous materials sites, creating potential for secondary impacts such as hazardous material release and service disruption.	ma-FL-NCo-52, ma-FL-NCo-55, ma-FL-NCo-56, ma-DF-NCo-120
ps-DF-NCo-384	Dam Failure	Threat	**Napa County**	Several high-capacity dams (e.g., Conn Creek, Milliken, Lake Curry) are located upstream of developed areas along the Napa Valley floor, with some located in shared tributary systems, creating potential for cascading failures and high-consequence flooding.	ma-FL-NCo-55
ps-DF-NCo-385	Dam Failure	Threat	**Napa County**	Approximately 15% of the County's population and over $1 billion in property value are located within mapped dam inundation zones, with exposure concentrated downstream of a small number of dams including Conn Creek and Milliken, increasing potential for significant life safety and economic impacts.	ma-AH-NCo-6, ma-DR-NCo-26, ma-FL-NCo-55, ma-FL-NCo-54, ma-FL-NCo-57
ps-DF-NCo-386	Dam Failure	Threat	**Napa County**	Many dams in Napa County were constructed prior to modern engineering standards and some are rated in fair or poor condition, which may increase the probability of failure under extreme conditions such as earthquakes or intense storm events.	ma-FL-NCo-55
ps-DF-NCo-387	Dam Failure	Victim	**Napa County**	Vulnerable populations, including children, elderly individuals, and persons with access and functional needs, are located within dam inundation zones and may face challenges evacuating due to limited warning time, mobility constraints, and constrained evacuation capacity in some areas.	ma-AH-NCo-6, ma-CC-NCo-15, ma-FL-NCo-55


Historic Downtown
Napa Mill
Visitor Information
Opera House
Wine Train Station
Oxbow Public Market

Earthquake

3.3.4 Earthquake Hazard Profile

Earthquake is the sudden shaking of the ground caused by the passage of seismic waves through Earth's rocks. Seismic waves are produced when some form of energy stored in Earth's crust is suddenly released, usually when masses of rock straining against one another suddenly fracture and "slip." Earthquakes associated with this type of energy release are called tectonic earthquakes. The energy also can be released by elastic strain, gravity, chemical reactions, or even the motion of massive bodies. Earthquakes occur most often along geologic *faults*, narrow zones where rock masses move in relation to one another. The seismic conditions in Napa County include the West Napa and Hunting Creek- Berryessa Fault Zones.

Earthquakes have different properties depending on the type of fault that causes them (Figure 3-26). The usual fault model has a "strike" (the direction from north taken by a horizontal line in the fault plane) and a "dip" (the angle from the horizontal shown by the steepest slope in the fault). The lower wall of an inclined fault is called the footwall. Lying over the footwall is the hanging-wall. When rock masses slip past each other parallel to the strike, the movement is known as strike-slip faulting. Movement parallel to the dip is called dip-slip faulting. In dip-slip faults, if the hanging-wall block moves downward relative to the footwall block, it is called "normal" faulting; the opposite motion, with the hanging-wall moving upward relative to the footwall, produces reverse or thrust faulting.

As a fault rupture progresses along or up the fault, rock masses are flung in opposite directions and thus spring back to a position where there is less strain.

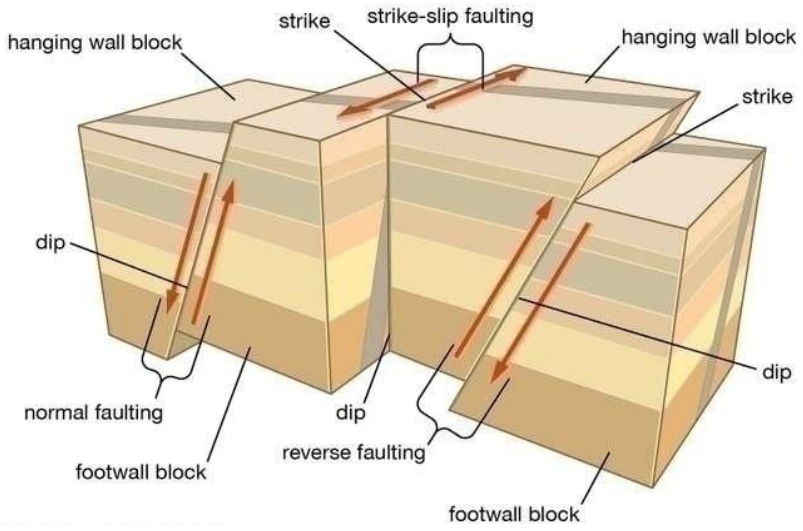


Figure 3-26: Earthquake Faulting

Earthquake Classifications

Earthquakes are typically classified in one of two ways: by the amount of energy released, measured as magnitude; or by the impact on people and structures, the most common method of measuring released energy is magnitude. While the majority of scientists now use either the Moment Magnitude (Mw) Scale or Modified Mercalli Intensity (MMI) Scale to measure an earthquake, the Richter scale is the most well-known; however, the Richter scale has been largely replaced with the more accurate Mw and MMI scales.

Magnitude

The magnitude of an earthquake is related to the total area of the fault that ruptured, as well as the amount of offset (displacement) across the fault. Table 3-29 summarizes the seven earthquake magnitude classes on the Mw scale, ranging from micro to great. A magnitude class of great can cause tremendous damage to infrastructure, compared to a micro class, which results in minor damage to infrastructure.

Table 3-29: Moment Magnitude (Mw) Scale

Magnitude Class	Magnitude Range (M = Magnitude)	Description
Great	M > 8	Tremendous damage
Major	7 <= M < 7.9	Widespread heavy damage
Strong	6 <= M < 6.9	Severe damage
Moderate	5 <= M < 5.9	Considerable damage
Light	4 <= M < 4.9	Moderate damage
Minor	3 <= M < 3.9	Rarely causes damage.
Micro	M < 3	Minor damage

Intensity

The effects of an earthquake in a particular location are measured by intensity. Earthquake intensity decreases with increasing distance from the epicenter of the earthquake. The MMI value assigned to a specific site after an earthquake has a more meaningful measure of severity to the nonscientist than the magnitude because intensity refers to the effects experienced at that place.

The **lower** numbers of the intensity scale generally deal with the manner in which the earthquake is felt by people. The **higher** numbers of the scale are based on observed structural damage. Structural engineers usually contribute information for assigning intensity values of VIII or above. Table 3-30 is an abbreviated description of the levels of MMI.

Table 3-30: Modified Mercalli Intensity (MMI) Scale

Intensity	Shaking	Description/Damage
I	Not Felt	Not felt except by a very few under especially favorable conditions.
II	Weak	Felt only by a few persons at rest, especially on upper floors of buildings.
III	Weak	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV	Light	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Moderate	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Strong	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Very Strong	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	Severe	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Violent	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Extreme	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.

Source: USGS, Abridged from The Severity of an Earthquake, USGS General Interest Publication 1989-288-913

Ground Motion

Earthquake hazard assessment is also based on expected ground motion. This involves determining the annual probability that certain ground motion accelerations will be exceeded, then summing the annual probabilities over the time period of interest. The most commonly-mapped ground motion parameters are the horizontal and vertical peak ground accelerations (PGA) for a given soil or rock type. Instruments called accelerographs record levels of ground motion due to earthquakes at stations throughout a region. These readings are recorded by state and federal agencies that monitor and predict seismic activity.

Maps of PGA values form the basis of seismic zone maps that are included in building codes such as the International Building Code (IBC). Building codes that include seismic provisions specify the horizontal force due to lateral acceleration that a building should be able to withstand during an earthquake. PGA values are directly related to these lateral forces that could damage "short period structures" such as single-

family dwellings. Longer-period response components determine the lateral forces that damage larger structures with longer natural periods such as apartment buildings, factories, high-rises, and bridges. Table 3-31 lists damage potential and perceived shaking by PGA factors, compared to the MMI scale.

Table 3-31: Modified Mercalli Intensity (MMI) Scale and Peak Ground Acceleration (PGA)

MMI Scale	Perceived Shaking	Potential Structure Damage		Estimated PGA (%g)
		Resistant Buildings	Vulnerable Buildings	
I	Not Felt	None	None	<0.17%
II-III	Weak	None	None	0.17% - 1.4%
IV	Light	None	None	1.4% - 3.9%
V	Moderate	Very Light	Light	3.9% - 9.2%
VI	Strong	Light	Moderate	9.2% - 18%
VII	Very Strong	Moderate	Moderate/Heavy	18% - 34%
VIII	Severe	Moderate/Heavy	Heavy	34% - 65%
IX	Violent	Heavy	Very Heavy	65% - 124%
X - XII	Extreme	Very Heavy	Very Heavy	>124%

Note: PGA is measured in percent of g, where g is the acceleration of gravity.

Source: USGS, 2008; USGS, 2010

Artificial Induction

Earthquakes are sometimes caused by human activities, including the injection of fluids into deep wells, pumping of ground water, the excavation of mines, and the filling of large reservoirs. In fluid injection, the slip is thought to be induced by premature release of elastic strain, as in the case of tectonic earthquakes, after fault surfaces are lubricated by the liquid.

3.3.4.1 Secondary & Compounding Hazards

Earthquakes can trigger secondary hazards that compound impacts, including soil liquefaction, tsunamis, dam failures, fires, and slope failure. Many of these secondary hazards relevant to Napa County are discussed in their respective profiles. These include dam failure (Section 3.3.3), wildfire (Section 3.3.1), and slope failure (Section 3.3.5). Although the secondary and compounding hazards discussed in this section are considerations in mitigation planning for Napa County, liquefaction and tsunami were found not to have a high enough probability or impact potential to warrant profiling in this plan.

Urban Fires

Gas leaks, explosions, and fires are common after an earthquake, especially in urban areas. As seen during the 1906 San Francisco Earthquake, the damage from an earthquake is not usually the end of the devastation. The fires that ensued following this event, which resulted from and were fueled by broken gas

lines and a lack of water pressure, caused additional impacts. According to the Earthquake Country Alliance, around one in four fires after an earthquake is related to a gas leak.

Tsunami

A tsunami is a series of traveling ocean waves of extremely long length, generated by disturbances associated primarily with earthquakes occurring below or near the ocean floor. Subduction zone earthquakes at plate boundaries often cause tsunamis. However, tsunamis can also be generated by submarine landslides, submarine volcanic eruptions, the collapse of volcanic edifices, and, in very rare instances, large meteorite impacts in the ocean.

Within Napa County, tsunami risk is considered minimal and highly localized due to its inland position relative to the Pacific Ocean. The County is situated along the northern portion of San Pablo Bay, which is partially sheltered by surrounding landforms and the broader San Francisco Bay system. This geographic configuration significantly attenuates tsunami wave energy before it can reach inland areas. As a result, tsunami impacts within the planning area are expected to be limited in both extent and severity compared to open-coast jurisdictions.

Available mapping from the California Geological Survey (CGS) identifies only small, low-probability inundation zones confined to the immediate vicinity of the Napa River mouth and adjacent low-lying tidal areas. No substantial wave amplification or deep inland penetration is anticipated under modeled scenarios. Consequently, tsunami hazards in Napa County are most appropriately characterized as a secondary or compounding hazard, with potential to contribute to localized flooding impacts when coinciding with other events such as high tides, storm surge, or fluvial flooding.

3.3.4.2 Subhazards

For Napa County, there are specific subhazards of earthquake that are more relevant to the planning area than others. This includes liquefaction and which are profiled as part of this section, but it also includes mention of thunderstorms and hail.

Soil Liquefaction

Liquefaction is a process by which sediments below the water table temporarily lose strength during an earthquake and behave as a viscous liquid rather than a solid. Liquefaction is restricted to certain geologic and hydrologic environments, primarily recently deposited sand and silt in areas with high groundwater levels, where these soils tend to be saturated, low-density, and loose. The process of liquefaction involves seismic waves passing through saturated granular layers, distorting the granular structure, and causing the particles to collapse. This causes the granular layer to behave temporarily as a liquid, resulting in liquefaction.

Saturated or partially-saturated soil substantially loses strength and stiffness in response to an applied stress, such as ground shaking or other sudden changes in stress condition. Loose sand has a tendency to

compress when a load is applied. Dense sands, by contrast, tend to expand in volume or 'dilate'. If the soil is saturated by water, which often occurs when soil is below the water table or sea level, then water fills the pore spaces between soil grains.

Liquefaction can cause the soil beneath a structure to lose strength, spread laterally, or lurch in the direction of an opening. Lateral spreading is lateral ground movement, with some vertical component, caused by liquefaction. In effect, the soil rides on top of the liquefied layer. Lateral spreading can occur on relatively flat sites with slopes less than 2%, under certain circumstances, and can cause ground cracking and settlement. Lurching is the movement of the ground surface toward an open face when the soil liquefies. An open face could be a graded slope, stream bank, canal face, gully, or other similar feature.

Severe property damage can be caused by soil liquefaction, including damaging pipes, compromising building foundations, and bucking roads and airport runways. For buildings, liquefaction may result in the loss of foundation-bearing capacity. This loss of strength commonly causes the structure to settle or tip. Loss of bearing strength can also cause light buildings with basements, buried tanks, and foundation piles to rise buoyantly through the liquefied soil. Soil liquefaction and related phenomena have been responsible for tremendous amounts of damage in historical earthquakes around the world.

3.3.4.3 Policies, Plans & Regulatory Environment

Federal Regulatory Environment

National Earthquake Hazards Reduction Program (NEHRP)

The National Earthquake Hazards Reduction Program (NEHRP) was established by the U.S. Congress when it passed the Earthquake Hazards Reduction Act of 1977, Public Law 95–124. In establishing the NEHRP, Congress recognized that earthquake-related losses could be reduced through improved design and construction methods and practices; land use controls and redevelopment; prediction techniques and early warning systems; coordinated emergency preparedness plans; and public education and involvement programs. The four basic goals of NEHRP remain unchanged:

1. Develop effective practices and policies for earthquake loss reduction and accelerate their implementation.
2. Improve techniques for reducing earthquake vulnerabilities of facilities and systems.
3. Improve earthquake hazards identification and risk assessment methods and their use.
4. Improve the understanding of earthquakes and their effects.

State Regulatory Environment

California Alquist-Priolo Earthquake Fault Zoning Act & Seismic Hazards Mapping Act

The Alquist-Priolo Earthquake Fault Zoning Act (Public Resources Code [PRC] Sections 2621 to 2630) was passed in 1972 to provide a statewide mechanism for reducing the hazard of surface fault rupture to structures used for human occupancy. The main purpose of the Act is to prevent the siting of buildings used for human occupancy across the traces of active faults. It should be noted that the Act addresses the potential hazard of surface fault rupture and is not directed toward other earthquake hazards, such as seismically induced ground shaking or landslides.

The law requires the State Geologist to identify regulatory zones (known as Earthquake Fault Zones or Alquist-Priolo Zones) around the surface traces of active faults and to depict these zones on topographic base maps, typically at a scale of one inch to 2,000 feet. Earthquake fault zones vary in width, although they are often 0.75-mile wide. Once published, the maps are distributed to the affected cities, counties, and state agencies for their use in planning and controlling new or renewed construction. With the exception of single-family wood-frame and steel-frame dwellings that are not part of a larger development (i.e., four units or more), local agencies are required to regulate development within the mapped zones. In general, construction of new buildings within 50 feet of an active fault zone is prohibited.

California Building Standards Code

The California Building Code (CBC), adopted by napa County, is another name for the body of regulations known as the California Code of Regulations, Title 24, Part 2, which is a portion of the California Building Standards Code. The CBC incorporates by reference the International Building Code (IBC) requirements with necessary California amendments. Title 24 is assigned to the California Building Standards Commission, which, by law, is responsible for coordinating all building standards.

Compliance with the CBC requires (with very limited exceptions) that structures for human occupancy be designed and constructed to resist the effects of earthquake motions. The Seismic Design Category for a structure is determined in accordance with either CBC Section 1613, Earthquake Loads, or the American Society of Civil Engineers Standard No. 7-05, Minimum Design Loads for Buildings and Other Structures. In brief, based on the engineering properties and soil types of a proposed site, plus location-specific ground acceleration information, a Seismic Design Category is assigned ranging from A to F, of which D, E, and F represents the most severe conditions.

The Code also requires that a geotechnical investigation be prepared for projects on sites categorized C or greater, all new buildings that are 4,000 square feet or larger, and new smaller buildings if they meet certain criteria. A California registered Geotechnical Engineer must determine design categories and prepare geotechnical investigations, as well as determine requirements for geotechnical designs necessary to meet standards for reducing exposure to geological hazards.

Benchmark Years

Revisions to the Uniform Building Code (UBC) and California Building Code (CBC) mark important milestones in the evolution of seismic design standards. These benchmarks are critical for understanding the vulnerability of Napa County's building stock, much of which was constructed before modern seismic requirements. (See Section 1.5.3.2 for building stock ages across the county.)

Table 3-32 summarizes the major revisions to the Uniform Building Code (UBC), California Building Code (CBC), and International Building Code (IBC) that shaped modern seismic design standards. These benchmarks highlight the evolution from the first voluntary seismic regulations in 1927 to the adoption of comprehensive, strength-based seismic design provisions in the late 20th century, and ongoing refinements through updated seismic hazard maps.

This context is critical for Napa County because much of the existing housing stock was constructed prior to these milestones, leaving many buildings without essential seismic safety features. Structures built before 1978 (prior to Title 24) and especially those constructed before 1997 (prior to the modern overhaul of seismic design provisions) are considered more vulnerable to earthquake damage. Buildings constructed after adoption of the CBC/IBC framework benefit from more rigorous seismic standards; however, ongoing updates underscore the continued need for seismic retrofits and strict code compliance to reduce risk in older structures.

Table 3-32: Seismic Benchmark Years

Year(s)	Code / Reference	Key Seismic Change
1927	**UBC**	First voluntary seismic regulations introduced following the 1925 Santa Barbara earthquake.
1933	**UBC / State Law**	Field Act (schools) and Riley Act (all buildings) mandated seismic design statewide after the Long Beach earthquake.
1967 & 1976	**UBC**	Requirements added to limit building drift and reduce damage to non-structural components.
1978	**CBC**	Enactment of Title 24, unifying California's building standards and incorporating seismic provisions.
1988	**UBC**	Establishment of benchmark base shear values, used as reference in later seismic codes.
1997	**UBC**	Final UBC edition; major overhaul with near-source effects, soil amplification factors, redundancy/reliability factors, and strength-based seismic design.
2000	**IBC / NEHRP**	International Building Code (IBC) introduced, incorporating NEHRP provisions; CBC amended from the IBC.
2007 & 2017	**IBC / CBC**	Major updates to seismic hazard maps based on new research, refining design requirements.

Local Regulatory Environment

Napa County General Plan

The Napa County General Plan includes the following goals and policies to mitigate the effects of earthquake:

- **Goal SAF-2 (Safety):** To the extent reasonable, protect residents and businesses in the unincorporated area from hazards created by earthquakes, landslides, and other geologic hazards.
- **Policy SAF-8:** Consistent with County ordinances, require a geotechnical study for new projects and modifications of existing projects or structures located in or near known geologic hazard areas, and restrict new development atop or astride identified active seismic faults in order to prevent catastrophic damage caused by movement along the fault. Geologic studies shall identify site design (such as setbacks from active faults and avoidance of on-site soil-geologic conditions that could become unstable or fail during a seismic event) and structural measures to prevent injury, death and catastrophic damage to structures and infrastructure improvements (such as pipelines, roadways and water surface impoundments not subject to regulation by the Division of Safety of Dams of the California Department of Water Resources) from seismic events or failure from other natural circumstances.
    - **Action Item SAF-8.1:** The County's seismic fault maps shall be reviewed regularly to ensure that they reflect the latest information available.
    - **Action Item SAF-8.2:** Updated maps should be made available to the public at County offices, on the County's Web site, and through other appropriate channels.
- **Policy SAF-43:** Consistent with state and federal requirements, critical facilities should be provided with additional earthquake resistance and damage control to allow such facilities to remain operative after a disaster.
- **Policy CC-29 (Community Character):** Significant historic resources that are damaged by flood, fire, neglect, earthquake, or other natural disaster should be carefully evaluated by a structural engineer with preservation experience before they are determined to be beyond repair and destroyed.

Napa County Code & Seismic Retrofit Ordinances

Communities in the Napa County Operational Area have all adopted Seismic Retrofit ordinances to reinforce historic buildings. During a previous update of the building and fire codes across the county, all jurisdictions in the county adopted the same county-wide regulations to streamline permitting and enforcement. Along with the seismic retrofit ordinances, the Napa County Code includes requirements for telecommunications facilities to be constructed to withstand the forces of the "maximum credible earthquake." (§ 18.119.080)

3.3.4.4 Past Events

Numerous earthquakes have occurred in and near Napa County over the last 25 years. See Table 3-33 for earthquake events 4.0 magnitude or greater since 2000. Two large-scale earthquakes in Napa County caused

damage, death, and injuries over the last twenty years. In September 2000, Napa County residents experienced a 4.9 earthquake on the West Napa Fault. Damages were estimated at $30-50 million. The August 24, 2014 South Napa earthquake was the largest in the San Francisco Bay Area since the 1989 Loma Prieta earthquake, registering at 6.0 on the moment magnitude scale and with a maximum Mercalli intensity of VIII (Severe). The epicenter of the earthquake was located northwest of the City of American Canyon on the West Napa Fault. Total damage in the southern Napa Valley and Vallejo areas was in the range of $362 million to $1 billion, with one person killed and 200 injured.

Table 3-33: Earthquakes near Napa County M4.0 or Greater Since 2000

Date	Location	Magnitude
1/2/2025	4 km NW of Cobb	4.7
6/08/2024	7 km NW of The Geysers	4.5
9/14/2022	3 km N of Santa Rosa	4.4
10/15/2019	1 km SSE of Pleasant Hill	4.5
1/4/2018	2 km from Berkeley	4.4
5/22/2015	10 km ENE of Yountville	4.1
8/24/2014	South Napa	6.0
8/3/2006	Northern California	4.5
5/8/2005	Northern California	4.1
5/25/2003	Northern California	4.1
9/3/2000	4.8 km SSW of Yountville	4.9

Source: USGS and EarthquakeTrack.com

3.3.4.5 Location

The Alquist-Priolo Act established earthquake fault zones in California. These Alquist-Priolo Earthquake Fault Zones encompass surface traces of active faults that have a potential for future surface fault rupture and are mapped across California. These zones have been established by the State Geologist and indicate an active fault within the zone. The fault may pose a risk to existing or future structures from a surface fault rupture. Figure 3-27 shows the location of fault zones as well as the underlying quaternary faults[6] near the County.

According to USGS, the most likely faults that are likely to produce strong ground shaking in Napa County include the Northern Hayward/Rodgers Creek in the west, the Mayacama in the northwest, the Hunting Creek-Berryessa in the north, the Green Valley in the southeast and the West Napa in the south central. The Concord-Green Valley and the West Napa Fault are the only two major faults that pass through Napa County. (Association of Bay Area Governments, 2014) See Figure 3-27 for locations of regional fault lines.

[6] Quaternary faults are those active faults that have been recognized at the surface and which have evidence of movement in the past 1.6 million years - the duration of the Quaternary Period.

Areas susceptible to liquefaction consist of softer, alluvial soils generally located in proximity to waterways like the Napa River (Figure 3-28).

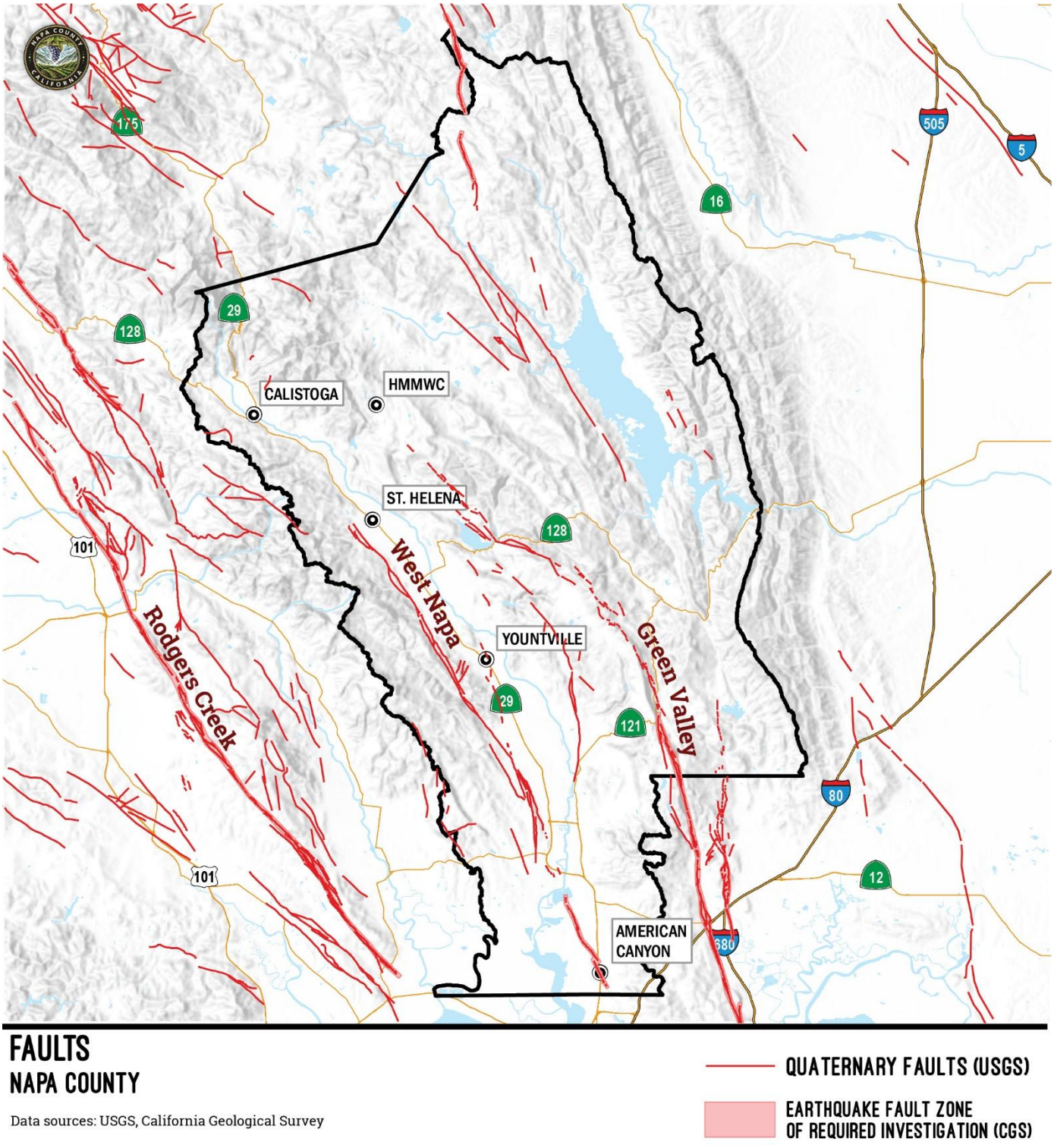


Figure 3-27: Regional Fault Lines

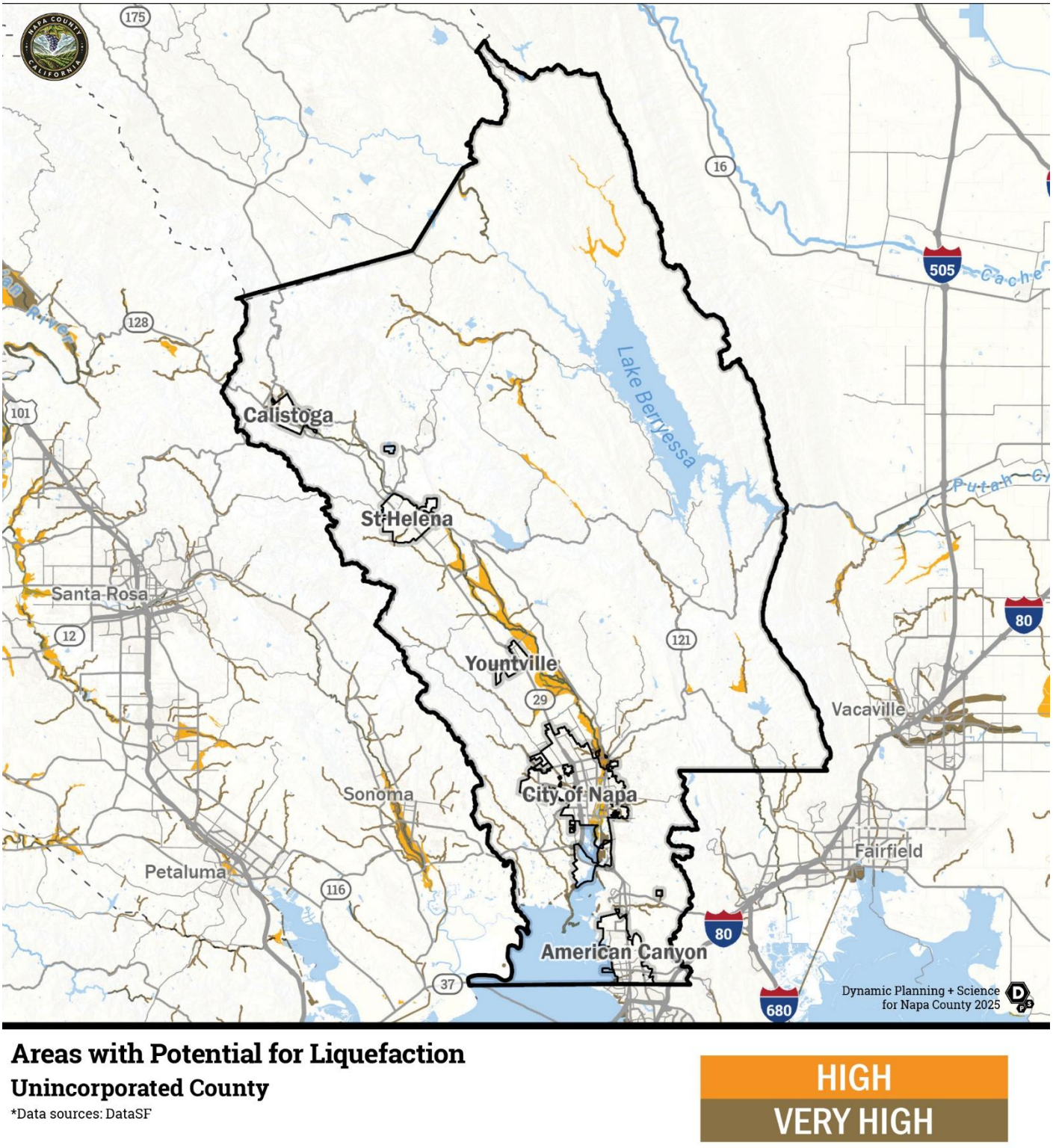


Figure 3-28: Napa County Liquefaction Risk

3.3.4.6 Frequency & Probability of Future Occurrences

According the California State Hazard Mitigation Plan, earthquakes large enough to cause moderate damage to structures—those of M5.5 or larger—occur three to four times a year statewide. Strong earthquakes of M6 to 6.9 strike on an average of once every two to three years, and major earthquakes of M7 to 7.9 occur in California about once every decade. The probability of an earthquake occurring in Napa County is likely (between 10 and 100% annual probability).

30-Year Earthquake Probability (UCERF3)

To clarify the extent of future earthquake risk, a partnership of the USGS, the California Geologic Survey (CGS), and the Southern California Earthquake Center, known as the Working Group on California Earthquake Probabilities, evaluated, and systemized currently available historic and paleo-seismic information to produce a probabilistic seismic hazards analysis to indicate the type of future earthquakes. The resulting model, the Uniform California Earthquake Rupture Forecast Version 3 (UCERF3),[7] is a comprehensive model of earthquake occurrence for California and represents the best available science for estimates of the magnitude, location, and likelihood of potentially damaging earthquakes (M6.7 or greater). This rupture forecast model tells us where and when the Earth might slip along the state's many faults.

The results of the UCERF3 for the San Francisco region are shown in Table 3-34. The table indicates the average time between earthquakes and the likelihood of having one or more such earthquakes in the next 30 years (starting from 2014). It is important to note that the repeat times are averages and actual repeat times will certainly vary significantly. The fault systems producing these earthquakes are located throughout the San Francisco Bay Area region including Napa County.

Table 3-34: 30-Year Probability of Earthquakes in the San Francisco Region

Magnitude	30-Year Probability	Average Repeat Time
5	**100%**	1.3 Years
6	**98%**	8.9 Years
6.7	**72%**	29 Years
7	**51%**	48 Years
7.5	**20%**	124 Years
8	**4%**	825 Years

Source: UCERF3

Probability of earthquake events is based on the approximate location of earthquake faults within and outside the Napa region. The Uniform California Earthquake Rupture Forecast, Version 3 (UCERF3) is a comprehensive model of earthquake occurrence for California. It represents the best available science for

[7] Quaternary faults are those active faults that have been recognized at the surface and which have evidence of movement in the past 1.6 million years (the duration of the Quaternary Period).

authoritative estimates of the magnitude, location, and likelihood of potentially damaging earthquakes in California. According to the USGS's earthquake probability maps, shown in Figure 3-29, the Hunting Creek-Berryessa fault has a 5% chance of producing an earthquake of 6.7 magnitude or greater in the next 30 years, while the Rodgers Creek / Hayward North fault, located just outside county boundaries, has a more than 10% chance.

The combined probability of a major earthquake occurring on one of the major faults passing through Napa County is 63% over the next thirty years. (Association of Bay Area Governments, 2014). Figure 3-30 shows likely shaking intensity in Napa County in any 50-year period from all possible faults. It is an equivalent risk to a 500-year flood event. 10% in 50 years was chosen as it most closely aligns to the levels of shaking the current building code is designed to withstand. The predicted shake intensity map, Figure 3-30, is not intended to be site-specific. Rather, it depicts the general risk within neighborhoods and the relative risk from community to community.

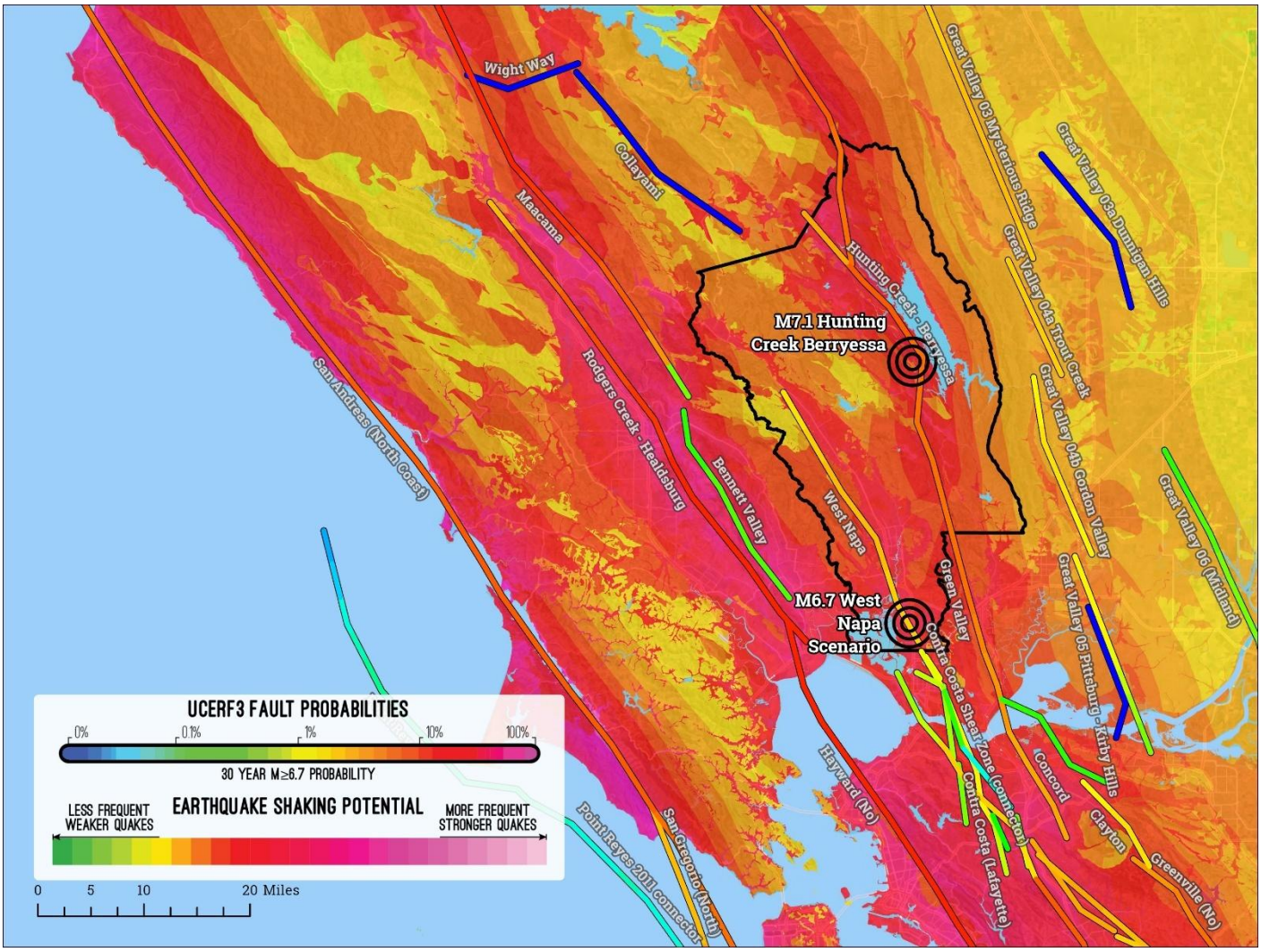


Figure 3-29: Fault Probability Map for Napa County Area

3.3.4.7 Severity

Damage from earthquakes varies with the local geologic conditions, the quality of construction, the energy released by the earthquake, the distance from the earthquake's focus, and the type of faulting that generates the earthquake. Ground motion is the primary cause of damage and injury during earthquakes and can result in surface rupture, liquefaction, landslides, lateral spreading, differential settlement, tsunamis, building failure and broken utility lines, leading to fire and other collateral damage. Typically, areas underlain by thick, water-saturated, unconsolidated material will experience greater shaking motion than areas underlain by firm bedrock, but in some cases, relief may intensify shaking along ridge tops.

Movement along local faults can cause fault-related surface deformation (e.g., surface fault rupture) where the fault reaches the surface of the ground. Within the mapped fault zones in the county, it is likely that movement along these faults will damage structures, roads, utilities, and other fixed facilities. The mapping of these zones has not changed for this plan update.

In addition to these zones, other ground cracking was observed during the 1989 Loma Prieta earthquake and the 1906 San Francisco earthquake. Many of these ground cracks can be attributed to movement or consolidation of large and moderate-sized landslides while other ground cracks were most likely related to ridge spreading.

As demonstrated during past events, even a "moderate" earthquake occurring in or near the Napa County region could result in deaths, casualties, property and environmental damage, and disruption of normal services and activities. The severity of the event could be aggravated by collateral emergencies such as fires, hazardous material spills, utility disruptions, landslides, and transportation emergencies.

As we know from past events, even a "moderate" earthquake occurring in or near the Napa County region could result in deaths, casualties, property and environmental damage, and disruption of normal services and activities. The severity of the event could be aggravated by collateral emergencies such as fires, hazardous material spills, utility disruptions, landslides, transportation emergencies, and the possible failure of the Napa County dams.

For this plan, a representative magnitude 6.7 West Napa Fault earthquake scenario[8] was used to show possible shake severity in the region in the earthquake vulnerability analysis, modeled after the South Napa Earthquake in 2014. This scenario was chosen from a range of regional, scenario-based shakemaps available from USGS. The shakemap data consist of peak ground velocity, peak ground acceleration, peak spectral accelerations in an earthquake scenario. See Figure 3-31 for potential shake intensities for the chosen scenario. If a 6.7 magnitude earthquake were to occur again along the West Napa fault, the County would experience moderate to severe shaking, as shown in and as felt in 2014.

[8] As described at the beginning of this profile, the severity of an earthquake can be expressed in terms of intensity or magnitude.

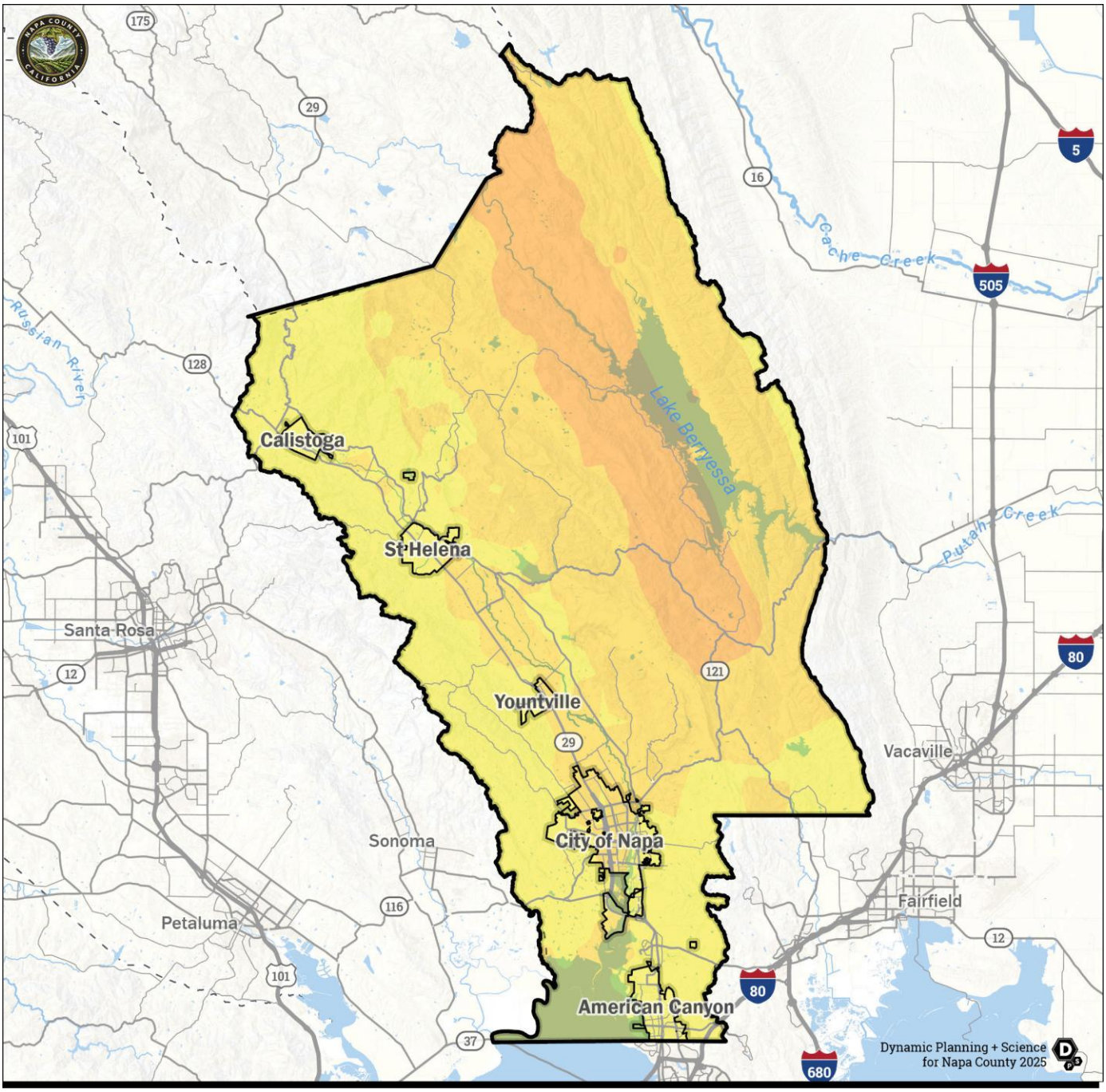


Figure 3-30: Napa County Earthquake Risk (M 7.1 Hunting Creek Berryessa Scenario)

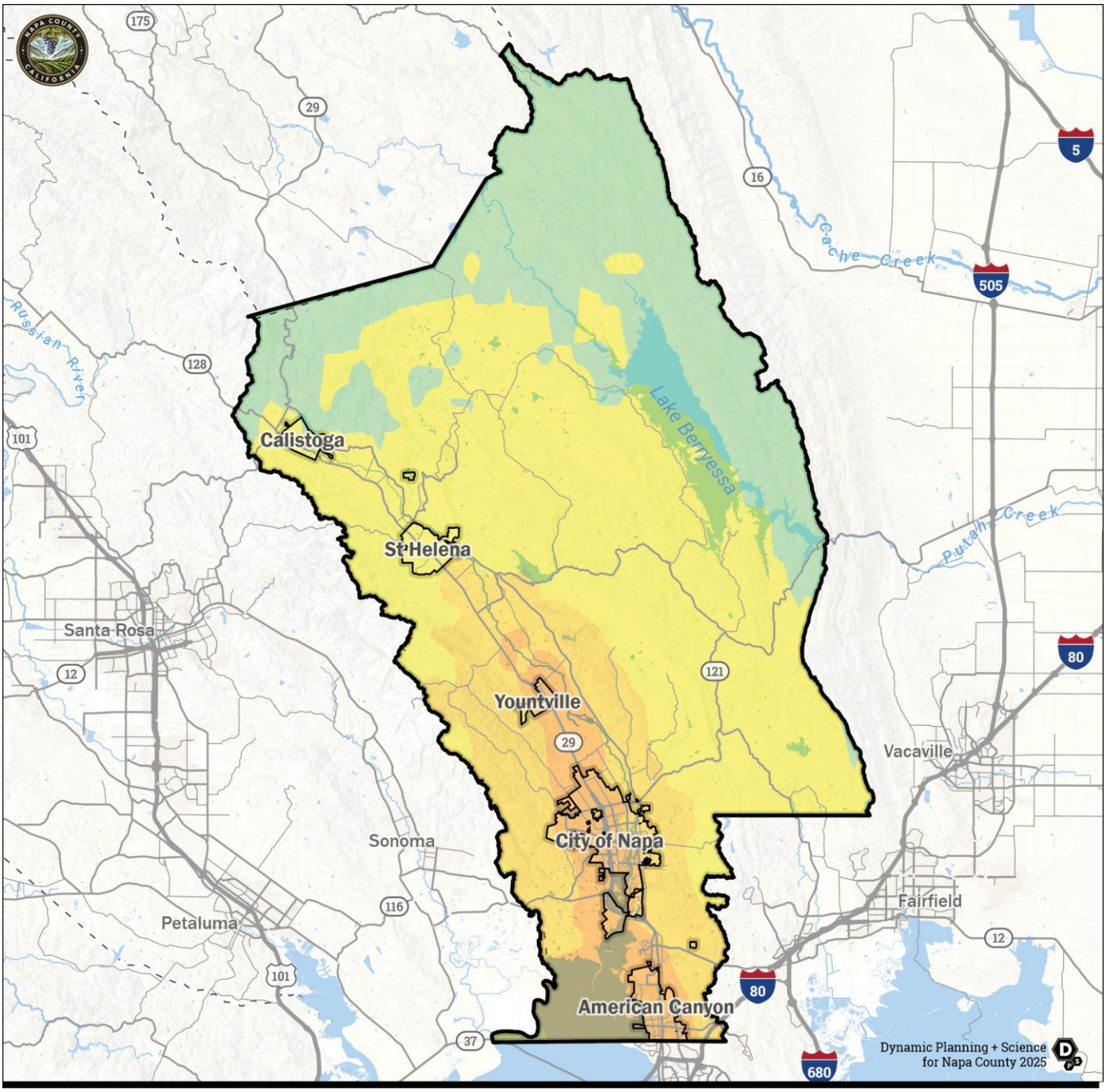


Figure 3-31: Napa County Earthquake Risk (M6.7 West Napa Scenario)

3.3.4.8 Warning Time

There is currently no reliable way to predict the day or month that an earthquake will occur at any given location, but research is being done with warning systems that use the low energy waves that precede major earthquakes. Currently, these systems are able to provide seconds and sometimes minutes of advance warning, which can allow people and systems to take actions to protect life and property from destructive shaking. Even a few seconds of warning can enable protective actions such as:

- **Public:** Individuals, including schoolchildren, drop, cover, and hold on; turn off stoves; and safely stop vehicles.
- **Businesses:** Personnel move to safe locations; automated systems ensure elevator doors open; production lines are shut down; and sensitive equipment is placed in a safe mode.
- **Medical Services:** Surgeons, dentists, and others stop delicate procedures.
- **Emergency Responders:** Open firehouse doors; personnel prepare and prioritize response decisions.
- **Power Infrastructure:** Protect power stations and grid facilities from strong shaking.

ALERT Napa County Notification System

ALERT Napa County is a system that enables the agencies within Napa County to provide the public with critical and non-critical information in a variety of situations. This includes situations such as severe weather, planned and unexpected road closures, missing persons, evacuations, natural disasters, and public health concerns. Many agencies across Napa County, including Emergency Services, the local jurisdictions, and Office of Education use ALERT Napa County to communicate with the public.

3.3.4.9 Earthquake Vulnerability Assessment

The vulnerability of a community to earthquake is based on a variety of factors, including proximity to active and inactive faults; the age and construction materials of structures; the density of the population and development; and the location of critical facilities. Recent history indicates that Napa County has a very high vulnerability to earthquakes due to proximity to faults and density of population.

One or more moderate to large sized earthquakes (M6.5 to 7.5) will likely shake the entire County of Napa during the life span of most residents. Many older homes that were damaged but not destroyed in 1989 were improved seismically but are still at a higher risk than newer construction using the latest building code standards. Modern homes will normally fare better in earthquakes but 1989 showed that this is not necessarily the case. Some older homes fared better than newer ones due to location and design.

A major earthquake on the West Napa Fault or other major fault in the regional will:

- Damage roads, bridges, and critical structures, and could severely damage most homes in the county.
- Potentially cause ruptures and ground cracking around the major faults and through nearby hillslopes.
- Potentially activate landslides, cause urban fires, or trigger other secondary hazards.

The following subsections summarize the population, property, and critical infrastructure and facilities exposed to earthquake hazards. Figure 3-32 and Figure 3-33 summarize the potential exposure of the population and these assets to two hypothetical earthquake scenarios: M7.1 Hunting Creek Berryessa and M6.7 West Napa.

Community needs would quickly exceed the response capability of the county's emergency management organization, requiring mutual assistance from volunteer and private agencies, the Governor's Office of Emergency Services, and the Federal Emergency Support Functions.

In any earthquake, the primary consideration is saving lives. Time and effort must also be given to providing for people's mental health by reuniting families, providing shelter to the displaced persons, and restoring basic needs and services. A major effort will be needed to remove debris and clear roadways, demolish unsafe structures, assist in reestablishing public services and utilities, and provide continuing care and temporary housing for affected citizens.

After any earthquake there will be a loss of income both in private and public sectors. Individuals can lose wages due to businesses inability to function because of damaged goods or facilities. Due to business losses, Napa County and the municipalities in the planning area will lose revenue. Economic recovery from even a minor earthquake is critical.

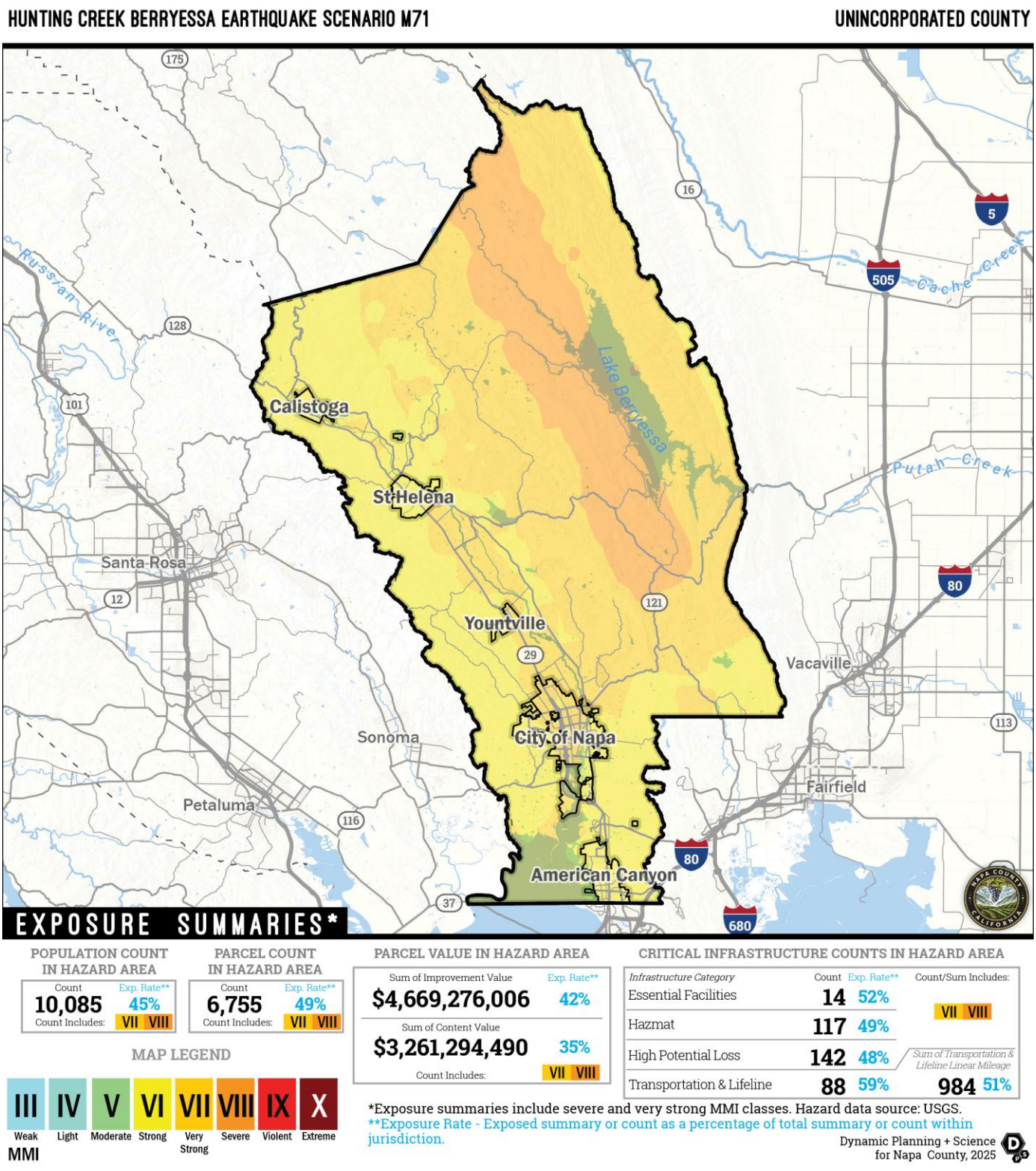


Figure 3-32: Exposure Summary – Napa County Earthquake Risk (M7.1 Hunting Creek Berryessa Scenario)

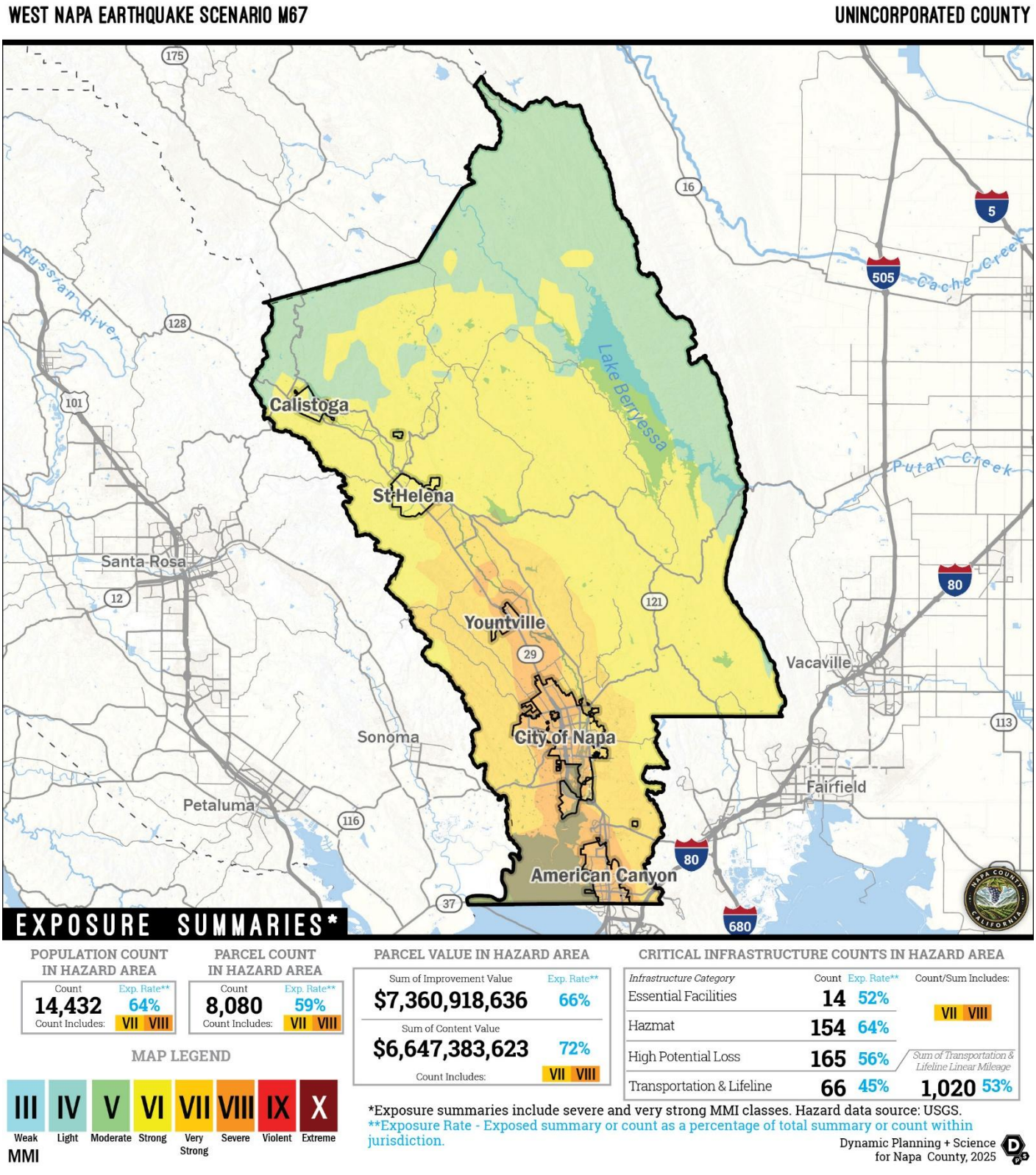


Figure 3-33: Exposure Summary – Napa County Earthquake Risk (M6.7 West Napa Scenario)

3.3.4.9.1 Population

The population exposed to earthquake in the planning area was estimated for two scenarios: a M6.7 earthquake on the West Napa Fault and a M7.1 earthquake on the Hunting Creek-Berryessa Fault. Figure 3-34 and Table 3-35 summarize population exposure results for the West Napa Fault scenario. Figure 3-35 and Table 3-36 summarize population exposure results for the Hunting Creek Berryessa Fault scenario The entire population of Napa County is potentially exposed to direct and indirect impacts from earthquakes. Approx. 100% of the population of Napa County is in either Very Strong, Severe, or Violent probabilistic shake intensity zones.

M6.7 earthquake on the West Napa Fault Scenario

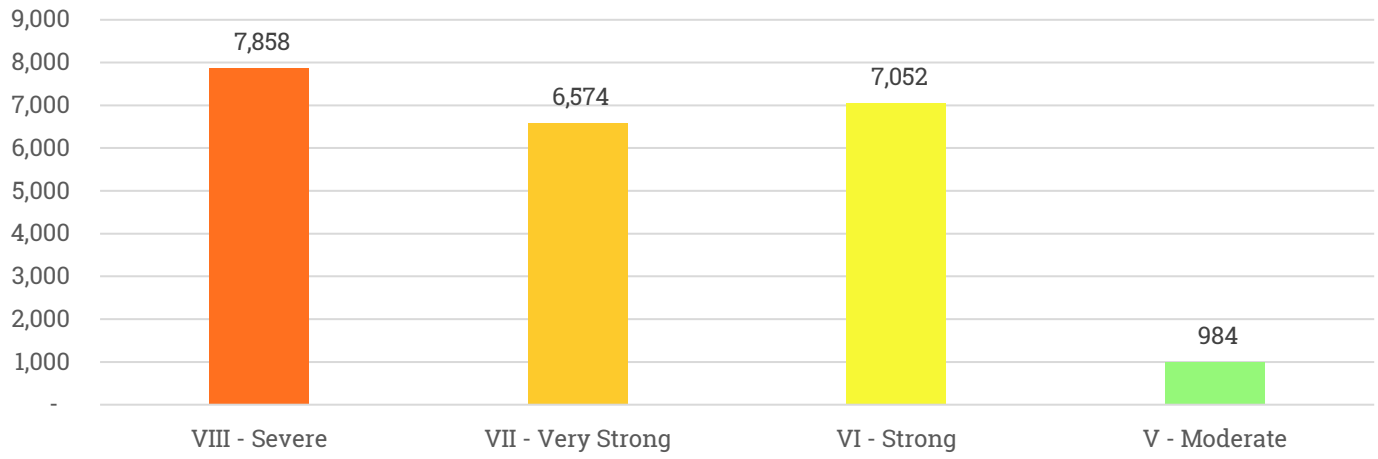


Figure 3-34: Napa County Population Exposure to Earthquake (M6.7 West Napa Scenario)

Table 3-35: Napa County Population Exposure to Earthquake (M6.7 West Napa Scenario)

	Total Population
Unincorporated County	22,468

Shake Severity Zone	Population Count	% of Total
VIII - Severe	7,858	34.97%
VII - Very Strong	6,574	29.26%
VI - Strong	7,052	31.39%
V - Moderate	984	4.38%
Total	**22,468**	**100.00%**

M7.1 earthquake on the Hunting Creek-Berryessa Fault

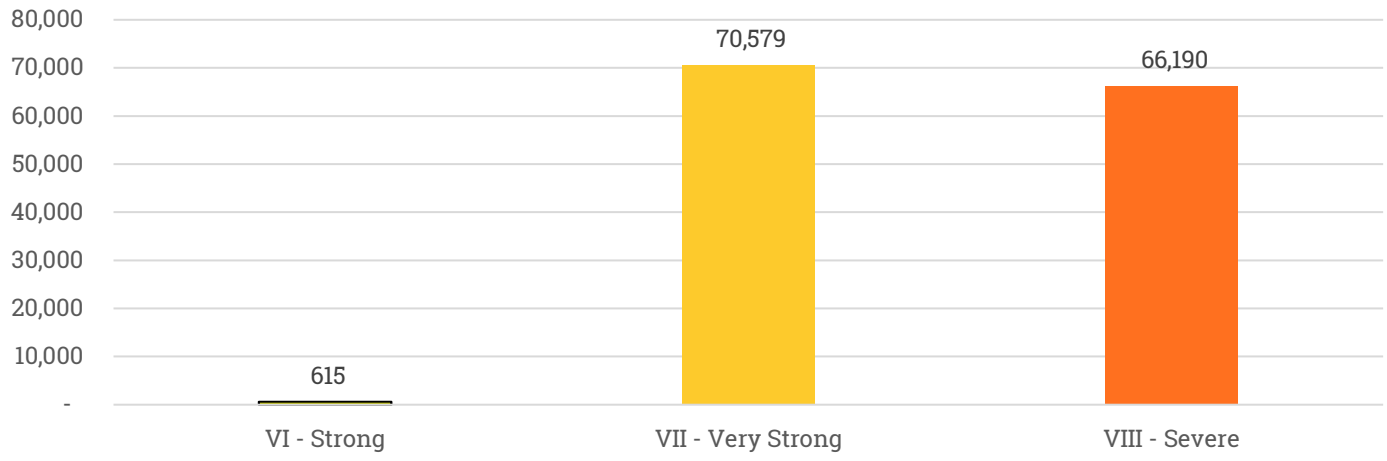


Figure 3-35: Napa County Population Exposure to Earthquake (M7.1 Hunting Creek-Berryessa Scenario)

Table 3-36: Napa County Population Exposure to Earthquake (M7.1 Hunting Creek-Berryessa Scenario)

	Total Population
Unincorporated County	22,468

Shake Severity Zone	Population Count	% of Total
VIII - Severe	615	2.74%
VII - Very Strong	9,470	42.15%
VI - Strong	12,383	55.12%
Total	**22,468**	**100.00%**

Disproportionately Impacted Populations

The degree of earthquake population exposure depends on many factors, including the age and construction type dwelling residents are inhabiting, the soil types on which their homes are constructed, and proximity to fault location. Whether directly or indirectly impacted, the entire population of the county will have to deal with the consequences of a large-scale localized earthquake. Business interruption could keep people from working, road closures could isolate populations, and loss of functions of utilities could impact populations that suffered no direct damage from an event itself.

Although earthquakes expose everyone in a specific geographic area to ground shaking, populations that live or work in older buildings that predated modern building code standards are more likely to exposed to loss that populations that live or work in more recently constructed buildings. Older buildings, particularly those of unreinforced masonry construction, are more likely to experience significant structural failings. In the aftermath of the 2014 West Napa earthquake, more than 150 buildings in Napa County were "red tagged" or deemed unsuitable for human habitation. Nearly all of them were older buildings.

In addition to structural and geographic factors, earthquake impacts in Napa County may disproportionately affect certain populations based on social and economic characteristics. As discussed in Section 1.5.3, individuals with access and functional needs, including older adults, persons with disabilities, and those with limited mobility, may face greater challenges during and after an earthquake event, particularly in evacuating damaged structures or accessing emergency services. Similarly, low-income households and renters are more likely to reside in older or more vulnerable housing stock and may have limited financial capacity to retrofit structures or recover following a damaging event. Language barriers, lack of transportation, and limited access to resources may further compound these challenges, particularly in the immediate aftermath when communication systems and lifelines are disrupted.

3.3.4.9.2 Property

Earthquake-related property vulnerability in Napa County is driven by both the intensity of anticipated ground shaking and the structural characteristics of the built environment. Scenario-based analysis indicates that all parcels in the County would be exposed to ground shaking during a major earthquake event, with large portions of the unincorporated area expected to experience strong to very strong shaking, and localized areas experiencing severe shaking under the M6.7 West Napa Fault and M7.1 Hunting Creek–Berryessa Fault scenarios. These levels of shaking are capable of causing widespread structural damage, particularly in buildings that do not meet modern seismic design standards.

To quantify potential property exposure, an inventory of current market values and content value was completed using County Assessor's parcel data. An inventory of current market values and content value was completed using County Assessor's parcel data. GIS was used to create centroids, or points, to represent the center of each parcel polygon, assumed to be the location of the structure for analysis purposes. The centroids were then superimposed with the USGS probabilistic shaking severity zones to determine the at-risk structures. Table 3-37 and Table 3-38 reveal the count of at-risk parcels and their associated building and content exposure values to the two earthquake scenarios.

All parcels within Napa County would be exposed to shaking during a damaging earthquake, which equates to approximately $54.3 billion in assessed assets. In areas projected to receive severe shaking during such an event, there is almost $20 billion in total exposure to a M6.7 earthquake on the West Napa Fault and a M7.1 earthquake on the Hunting Creek-Berryessa Fault. This concentration of high-value assets in areas of strong to severe shaking indicates a significant potential for widespread structural damage and economic loss during a major earthquake event.

Table 3-37: Parcel Exposure to M6.7 West Napa Earthquake Shake Scenarios

	Total Parcels	Total Market Value ($)	Total Content Value ($)	Total Value ($)
Unincorporated County	13,668	$11,215,199,644	$9,248,691,039	$20,463,890,683

Shake Severity Zone	Improved Res. Parcel Count	% of Total	Market Value Exposure ($)	Content Value Exposure ($)	Total Exposure ($)	% of Total
VIII - Severe	2,310	16.9%	$3,234,845,964	$3,489,055,810	$6,723,901,774	32.9%
VII - Very Strong	5,770	42.2%	$4,126,072,672	$3,158,327,813	$7,284,400,485	35.6%
VI - Strong	5,082	37.2%	$3,575,651,143	$2,431,735,902	$6,007,387,045	29.4%
V - Moderate	506	3.7%	$278,629,864	$169,571,514	$448,201,378	2.2%
Total	**13,668**	**100.0%**	**$11,215,199,644**	**$9,248,691,039**	**$20,463,890,683**	**100.0%**

Table 3-38: Parcel Exposure to M7.1 Hunting Creek-Berryessa Earthquake Shake Scenarios

	Total Parcels	Total Market Value ($)	Total Content Value ($)	Total Value ($)
Unincorporated County	13,668	$11,215,199,644	$9,248,691,039	$20,463,890,683

Shake Severity Zone	Improved Res. Parcel Count	% of Total	Market Value Exposure ($)	Content Value Exposure ($)	Total Exposure ($)	% of Total
VIII - Severe	556	4.1%	$281,940,469	$153,263,510	$435,203,979	2.1%
VII - Very Strong	6,199	45.4%	$4,387,335,537	$3,108,030,980	$7,495,366,517	36.6%
VI - Strong	6,913	50.6%	$6,545,923,638	$5,987,396,549	$12,533,320,187	61.2%
V - Moderate	0	0%	$0	$0	$0	0%
Total	**13,668**	**100.0%**	**$11,215,199,644**	**$9,248,691,039**	**$20,463,890,683**	**100.0%**

Building Stock vs. Benchmark Years

While the tables above illustrate the extent of exposure to ground shaking, the severity of damage is strongly influenced by the characteristics of the building stock, particularly construction era and seismic design standards.

According to the Napa County Assessor's Office, a substantial portion of the unincorporated county's housing stock was constructed prior to the adoption of modern seismic design standards (Table 3-39). As discussed in Section 1.5.3.2, approximately two-thirds of structures in the unincorporated county were built before 1980, including roughly 24% constructed in 1939 or earlier. These structures predate both the 1978 establishment of California's Title 24 building standards and the significant seismic design improvements incorporated in the 1997 Uniform Building Code (UBC).

As a result, a large share of the housing stock may not incorporate modern seismic safety provisions unless retrofitted. Older structures, particularly those constructed prior to 1978, are more likely to experience significant structural damage during strong ground shaking due to limited lateral force resistance, outdated construction practices, and lack of consideration for site-specific hazards such as soil conditions and near-fault effects.

In addition to structural vulnerability, building age is often correlated with broader social vulnerability factors described in Section 1.5.3. Lower-income households and renters are more likely to reside in older or more vulnerable structures and may have limited capacity to retrofit or recover following a damaging earthquake. Similarly, individuals with access and functional needs may face increased risks in structurally compromised buildings. These factors can contribute to disproportionate impacts, even where exposure to ground shaking is widespread.

Table 3-39: Building Stock Ages and Benchmark Years

Construction Era	Seismic Code Context	Approx. Share of Building Stock	Vulnerability Notes
Pre-1950	Built prior to modern seismic awareness; many structures predate enforced seismic provisions	**29%**	**Very high vulnerability** — includes unreinforced masonry and non-ductile construction; often associated with older, lower-value housing stock
1950–1979	Limited seismic provisions; predates Title 24 (1978) or early implementation period	**38%**	**High vulnerability** — improved construction practices but still lacks modern lateral design; represents a large share of exposed housing
1980–1996	Early Title 24 era; incremental seismic improvements prior to 1997 UBC	**20%**	**Moderate vulnerability** — better performance but lacks modern near-fault and soil amplification considerations
Post-1997	Built under modern UBC (1997) and later CBC/IBC standards	**13%**	**Lower vulnerability** — incorporates modern seismic design; however, social vulnerability factors may still influence impacts and recovery

Source: Napa County Assessor's Roll; Seismic Code Benchmarks from UBC/CBC/IBC history

Newer construction under CBC/IBC standards provides stronger protection against seismic forces. For the large share of older structures that predate modern code requirements, the County's role will focus on public education, outreach, and incentives to encourage homeowners to pursue voluntary retrofits. By providing information on available programs, technical guidance, and potential funding opportunities, the County can help reduce seismic vulnerability in existing housing stock and reduce potential economic losses associated with future earthquake events, while ensuring new development continues to meet updated code standards.

3.3.4.9.3 Critical Facilities & Infrastructure

Earthquakes pose numerous risks to critical facilities and infrastructure. Seismic risks, or losses, that are likely to result from exposure to seismic hazards include:

- Utility outages.
- Economic losses for repair and replacement of critical facilities, roads, buildings, etc.
- Indirect economic losses such as income lost during downtime resulting from damage public infrastructure.
- Roads or railroads that are blocked or damaged can prevent access throughout the area and can isolate residents and emergency service providers needing to reach vulnerable populations or to make repairs.

Linear utilities and transportation routes are vulnerable to rupture and damage during and after a significant earthquake event. The cascading impact of a single failure can have affects across multiple systems and utility sectors. Degrading infrastructure systems and future large earthquakes with epicenters near critical regional infrastructure could result in system outages that last weeks for the most reliable systems, and multiple months for others.

All critical facilities in Napa County are exposed to the earthquake hazard. Table 3-40 and Table 3-41 list the number of each type of facility in the Violent, Severe, and Very Severe M6.7 West Napa and M7.1 Hunting Creek Berryessa Earthquake Shake Scenarios within the County.

All of the critical facilities and infrastructure in the county would be exposed to strong, very strong, or severe shaking during a major earthquake, such as the M6.7 West Napa Earthquake scenario. Notably, a significant portion of essential, high-potential-loss, and hazardous materials facilities would be subject to severe shaking during such an event, including five fire stations and two dams, potentially driving up casualties and damage due to disruptions to emergency services and the triggering of secondary hazards like dam failures or hazardous material releases. In addition, over 370 miles of critical infrastructure is exposed to shaking, including roadways, transmission lines, sewer lines, and natural gas pipelines. Damage to these systems would not only disrupt mobility and emergency response during and after the event but could also contribute to additional hazards such as downed power lines, urban fires, and environmental contamination.

Utilities

Linear utilities and transportation infrastructure would likely suffer considerable damage in the event of an earthquake. Due to the amount of infrastructure and sensitivity of utility data, linear utilities are difficult to analyze without further investigating individual system components.

Table 3-42 and Table 3-43 provide best available linear utility data for the two earthquake scenarios; it should be assumed that these systems are exposed to breakage and failure.

Water

Water availability and distribution for supporting life and treating the sick and the injured are of major concern to Napa County. The three reservoirs in Napa are on solid ground and are expected to be usable after a major earthquake, but Lake Hennessey may be inaccessible due to damage to the pipelines that distribute potable water. Napa is connected to the State Water Project at Jameson Canyon and has a tertiary source in Milliken Dam water treatment facility. Any one of these three facilities remaining in operation is able to supply the emergency potable water needs to the City of Napa and its immediately contiguous County areas, if the distribution system can be repaired.

There are three water reservoirs within the City of Napa that have all been recently retrograded and covered, and one reservoir in the City of St Helena. If the reservoirs and water tanks remain intact, they will likely provide ample potable water to meet demands during the time the water treatment stations are being repaired. However, water tanks in some participating jurisdictions have low survivability; potable water will most likely have to be supplied.

Natural Gas

Several common characteristics of earthquakes and their impacts on natural gas safety are:

- Earthquake ground shaking will generally lead to substantially more instances of building damage than fire ignitions.
- Ground motions that are sufficient enough to damage buildings are the most likely to impact utility and customer gas systems and create a potential for gas-related fire ignitions.
- The number of post-earthquake fire ignitions related to natural gas can be expected to be 20% to 50% of the total post-earthquake fire ignitions.
- The consequences of post-earthquake fire ignitions for residential gas customers are largely financial. A fire ignition only becomes a life safety concern when inhabitants are unable to exit the building following earthquakes. Experience in past earthquakes indicates that egress from earthquake damaged single-family homes is generally possible because of the limited structure height, low numbers of occupants, and multiple direct escape paths through doors and windows.
- The potential life safety dangers from post-earthquake fires are considerably more serious in seismically vulnerable apartment or condominium buildings since they provide a greater chance for damaging the structure and trapping the occupants.

Pacific Gas and Electric Company (PG&E), Napa County's natural gas utility, is responsible for designing, constructing, maintaining, and operating the natural gas system safely and efficiently. This includes all the facilities used in the delivery of gas to any customer up to and including the point of delivery to the customers' gas piping system.

Gas customers and Napa County residents are responsible for using gas safely on their property and within their buildings and other facilities. Customers meet this responsibility by maintaining their gas appliances in good working condition, assuring that only qualified individuals are engaged to modify or

maintain their gas service and facility piping, and knowing what to do before and after earthquakes to maintain the safe operation of their natural gas service.

The following conditions, when combined, pose the greatest risk for post-earthquake fire damage:

- Buildings are unoccupied and individuals are not present to mitigate damage to gas systems or control small fires.
- High building density or dense, fire-prone vegetation.
- High wind and low humidity weather conditions.
- Damage to water systems that severely limits firefighting capabilities.
- Reduced responsiveness of firefighting resulting from impaired communications, numerous requests for assistance, direct damage to fire stations, restricted access because of traffic congestion and damaged roadways, and delays in mutual aid from neighboring fire districts.

Telecommunication

Telecommunication systems will be affected by system failure, overloads, loss of electrical power and possible failure of some alternate power systems. Immediately following an event, numerous failures will occur, compounded by system use overloads. This will likely disable up to 80% of the telephone system for one day. County UHF/VHF and microwave radio systems are expected to operate at 40% effectiveness the first 12 hours following an earthquake, increase to 50% for the second 12 hours then begin to slowly decline to approximately 40% within 36 hours.

Microwaves systems will likely be 30% or less effective following a major earthquake. Damage to natural gas facilities serving the Napa communities will consist primarily of isolated breaks in major transmission lines. Breaks in mains and individual service connections within the distribution system will be significant, particularly near the fault zones, especially in the cities of American Canyon and Napa. These many leaks pose a fire threat in these susceptible areas of intense ground shaking and/or poor ground near the shoreline. Breaks in the system will affect large portions of the County and restoration of natural gas service could be significantly delayed.

Transportation

Significant damage is expected on the road systems with Napa County following an earthquake. State Highway 12 is expected to be impassable from Cordelia to the Highway 29 Intersection. Interstate 80 could suffer severe surface distortion in the Fairfield and Vacaville areas, as well as damage to its numerous bridges and viaducts in the greater Bay Area. Highway 128 is subject to landslides both up valley toward Geyserville and in the hills around Lake Berryessa. Highway 29 leaving the County to the north is subject to landslides and debris flows to the south where it crosses over old bay mud and fills areas and is subject to soil liquefaction and surface distortion. Any combination of failures of these main highways could isolate the County for up to 72 hours with complete road restoration taking perhaps several weeks. Vehicular traffic will be limited on the foothill roads due to potential and actual landslides. (Napa County Operational Area Hazard Mitigation Plan 2013 Update, 2013)

Soil liquefaction problems could cause the closure of several roads in American Canyon and areas of other cities built on unconsolidated river soils. (Napa County Operational Area Hazard Mitigation Plan 2013 Update, 2013).

Table 3-40: Critical Facilities Exposure to Earthquake (M6.7 West Napa Scenario)

Critical Infrastructure - M6.7 West Napa				
Infrastructure Type	VIII - Severe	VII - Very Strong	VI - Strong	V - Moderate
Essential Facilities	5	9	13	-
EOC	1	-	-	-
Fire Station	2	9	9	-
Hospital	-	-	1	-
Law Enforcement	2	-	3	-
High Potential Loss	87	78	118	14
Adult Residential Care	-	-	-	-
Child Care Center	2	5	4	-
Church	1	8	8	-
Communication Tower	5	7	4	1
Dam	-	10	33	7
Emergency Shelter	1	1	7	-
Farm Worker Housing	2	-	2	-
Historic Building	1	6	4	-
Library	-	-	1	-
Mobile Home Park	-	2	5	-
Res Elder Care Facility	-	3	4	-
Private School	-	-	3	-
Public School	-	-	-	-
Real Property Asset	71	36	43	6
Transportation and Lifeline	22	44	54	28
Airport	1	2	4	1
Bridge	16	35	34	11
Bus Stop	-	-	-	-
HMMWC Asset	-	-	-	-
HMMWC Dam	-	-	-	-
HMMWC Hydrant	-	-	-	-
NG Station	1	1	-	-
Power Plant	2	2	-	3
Substation	-	3	1	2
Wastewater Treatment Facility	-	-	6	6

Water Supply Intake	-	-	1	1
Water Tank	2	1	5	3
Water Treatment Facility	-	-	3	1
Hazmat	66	88	80	7
Geotracker Cleanup Site	-	2	1	1
HWTS Active Facility	65	86	77	6
Landfill	1	-	2	-
Grand Total	**180**	**219**	**265**	**49**

**Real Property Assets are digitized insurance rolls for demonstrating value and ownership and may have overlapping points with other categories such as fire stations and law enforcement.*

Table 3-41: Napa County Critical Facilities Exposure to Earthquake (M7.1 Hunting Creek Berryessa Scenario)

Critical Infrastructure - M7.1 Hunting Creek Berryessa			
Infrastructure Type	VIII - Severe	VII - Very Strong	VI - Strong
Essential Facility	3	11	13
EOC	-	-	1
Fire Station	2	9	9
Hospital	-	-	1
Law Enforcement	1	2	2
High Potential Loss	19	123	155
Adult Residential Care	-	-	-
Child Care Center	-	4	7
Church	2	7	8
Communication Tower	-	3	14
Dam	5	28	17
Emergency Shelter	2	5	2
Farm Worker Housing	-	2	2
Historic Building	-	6	5
Library	-	1	-
Mobile Home Park	3	-	4
Res Elder Care Facility	-	2	5
Private School	-	2	1
Public School	-	-	-
Real Property Asset	7	63	86
Transportation and Lifeline	31	57	60
Airport	3	3	2
Bridge	11	42	43

Bus Stop	-	-	-
HMMWC Asset	-	-	-
HMMWC Dam	-	-	-
HMMWC Hydrant	-	-	-
NG Station	-	-	2
Power Plant	-	3	4
Substation	1	2	3
Wastewater Treatment Facility	11	1	-
Water Supply Intake	1	1	-
Water Tank	3	3	5
Water Treatment Facility	1	2	1
Hazmat	13	104	124
Geotracker Cleanup Site	1	1	2
HWTS Active Facility	11	103	120
Landfill	1	-	2
Grand Total	**66**	**295**	**352**

Table 3-42: Napa County Infrastructure Exposure to Earthquake (M6.7 West Napa Scenario)

Lifelines (miles) - M6.7 West Napa				
Infrastructure Type (Linear)	V-Moderate	VI-Strong	VII-Very Strong	VIII-Severe
Levee	-	-	6.6	96.3
NG Pipeline	-	5.7	18.7	19.8
Railroad	-	0.0	8.1	15.6
Transmission Line	14.0	44.5	41.8	6.0
Street OSM	113.6	737.8	566.4	240.6
Highway & Interstate	-	-	2.7	2.2
Major Road	12.3	7.6	24.7	17.8
Residential Road	17.6	136.3	90.9	30.4
Road - Secondary	3.9	59.9	25.9	6.5
Road - Tertiary	8.8	76.2	42.2	19.3
Service Road	43.5	410.9	367.2	154.6
Unclassified	27.5	46.9	12.8	9.8
Grand Total	**127.6**	**788.1**	**641.6**	**378.3**

Table 3-43: Napa County Infrastructure Exposure to Earthquake (M7.1 Hunting Creek Berryessa Scenario)

Lifelines (miles) - M7.1 Hunting Creek Berryessa

Infrastructure Type (Linear)	VI-Strong	VII-Very Strong	VIII-Severe
Levee	11.0	91.8	-
NG Pipeline	31.1	13.2	-
Railroad	10.6	13.1	-
Transmission Line	72.1	28.3	6.0
Street OSM	826.4	713.4	118.7
Highway & Interstate	4.5	0.4	-
Major Road	46.1	16.3	-
Residential Road	156.3	109.9	8.9
Road - Secondary	40.5	44.3	11.5
Road - Tertiary	59.2	62.0	25.2
Service Road	489.4	424.3	62.6
Unclassified	30.4	56.1	10.5
Grand Total	**951.2**	**859.7**	**124.7**

3.3.4.10 Development Trends

Land use in the planning area will be directed by general plans adopted under California's General Planning Law. The safety elements of the general plans establish standards and plans for the protection of the community from hazards. The information in this plan provides the participating partners a tool to ensure that there is no increase in exposure in areas of high seismic risk. Development in the planning area will be regulated through building standards and performance measures so that the degree of risk will be reduced. The geologic hazard portions of the planning area are heavily regulated under California's General Planning Law. The International Building Code establishes provisions to address seismic risk.

Napa County has a number of compact urban communities as well as extensive areas of agricultural land and forested hillsides and many rural villages and towns. As dictated by Measure D, most new development has occurred within or adjacent to the urban services line (i.e., the boundary point for such infrastructure as water and sewage service). As with most communities, increased housing costs has resulted in the need to provide higher density housing. In Napa County, all development of this type occurs where urban services are available; other development is mostly in-fill or reuse development, and development of existing rural residential properties.

Growth management policies including the Geologic Hazards Ordinance limit development from occurring where hazards are present and, in most cases, require substantial setbacks from these hazards. Seismic safety standards are a requirement for all building permits, and as infrastructure is repaired or replaced, updated seismic safety standards are incorporated. Development on existing lots of record is required to avoid hazards and incorporate appropriate setbacks and other requirements to mitigate potential impacts

from earthquake and liquefaction hazards. The Planning, Building, and Environmental Services Department, staffed by resource planners, specializes in reviewing each application for new residential and commercial structures to ensure that new development does not occur in earthquake and liquefaction hazards and that development on existing lots of record avoid, minimize, and mitigate potential impacts from identified earthquake and liquefaction hazards.

No changes in these development regulations or patterns occurred that would affect the county's overall vulnerability since the previous plan was adopted. As noted above, most new development of residential structures and virtually all new development of commercial structures occurs within the urban services line, and always outside of the highest risk earthquake hazard areas.

Development Impacts

New development within Napa County will increase exposure of residents and workers to earthquake hazards such as strong ground shaking. However, adherence to modern building codes serves to mitigate a substantial aspect of that risk.

3.3.4.11 Climate Change Impacts

Unlike hazards such as flooding, wildfire, and drought, earthquakes are not directly influenced by climate change. However, climate change can compound earthquake impacts by stressing the same populations and systems that are most vulnerable to seismic risk. Residents living in older, unretrofitted housing, mobile homes, or low-income communities already face disproportionate earthquake risks, and these same groups are often more exposed to climate-driven hazards like extreme heat, wildfire smoke, or flooding. Repeated climate stressors can erode financial stability, limit access to insurance or retrofitting resources, and reduce community capacity to prepare for and recover from seismic events. In this way, climate change intensifies underlying social vulnerabilities, making recovery from earthquakes more difficult for disadvantaged and dependent populations.

3.3.4.12 Earthquake Hazard Problem Statements

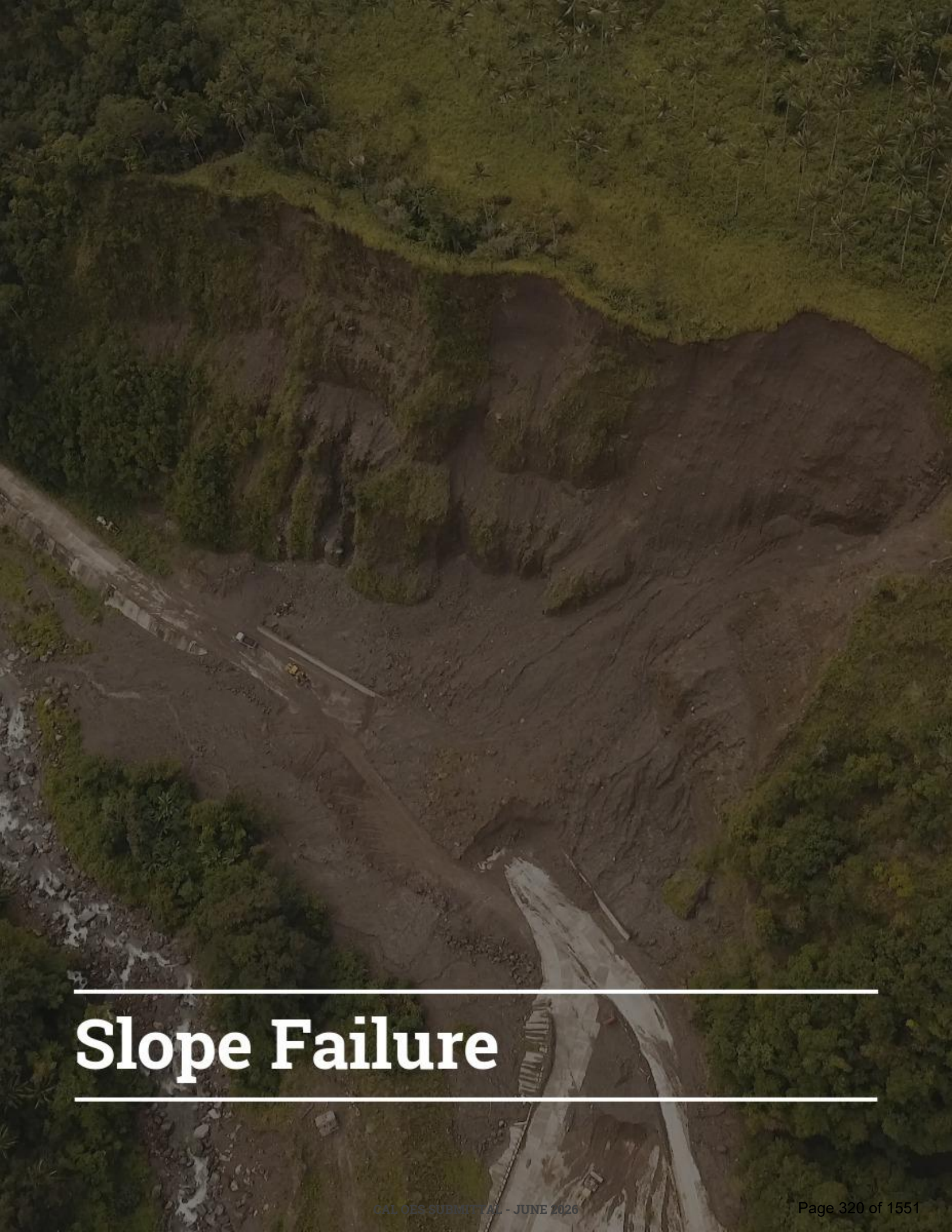
As part of the mitigation action identification process, the Napa County Planning Team developed areas of concern (i.e., problem statements) that summarize the county's most pressing earthquake-related vulnerabilities and challenges. The problem statements were developed based on the updated risk assessment and vulnerability analysis contained herein, as well as the team's local knowledge and experience and community input. The problem statements address a broad spectrum of concerns, from direct impacts on residents and vulnerable populations to threats to critical infrastructure and long-term recovery.

These problem statements are not intended to be all-encompassing or to describe each and every issue associated with earthquake. Instead, they highlight the most urgent concerns that can be addressed within the scope of this MJHMP. Each statement will be linked to at least one mitigation action, ensuring that

identified needs are met with specific, measurable, and equitable solutions. Table 3-44 presents the earthquake hazard problem statements for Napa County, along with their associated areas of concern and reference numbers for cross-linking to the mitigation actions in Table 4-4.

Table 3-44: Napa County Earthquake Hazard Problem Statements

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-EQ-NCo-56	Earthquake	Threat	**Napa County**	Many older public safety buildings, including fire and law enforcement facilities, require retrofits to improve seismic resilience and ensure continuity of emergency services during a major earthquake.	ma-AH-NCo-4, ma-EQ-NCo-38, ma-CC-NCo-15, ma-DR-NCo-26, ma-EQ-NCo-37
ps-EQ-NCo-57	Earthquake	Impact	**Napa County**	The 2014 South Napa earthquake highlighted gaps in mapping and contingency planning and exposed the vulnerability of critical utility systems to ground failure, the fire hazards from system damage, and the financial challenges public agencies face in improving seismic resilience.	ma-EQ-NCo-38, ma-EQ-NCo-37
ps-EQ-NCo-58	Earthquake	Victim	**Napa County**	Home and business owners often lack clear information and understanding about earthquake insurance and seismic retrofits, limiting participation in programs that help improve structure safety and protect private assets. The South Napa event highlighted significant gaps insurance coverage and funding for private retrofits.	ma-EQ-NCo-36, ma-EQ-NCo-37, ma-AH-NCo-6, ma-DR-NCo-26
ps-EQ-NCo-62	Earthquake	Impact	**Napa County**	Deaths and injuries sustained in the South Napa earthquake point to continuing gaps in public awareness and education on earthquake safety and preparedness.	ma-AH-NCo-4, ma-EQ-NCo-36, ma-EQ-NCo-37, ma-AH-NCo-6
ps-EQ-NCo-77	Earthquake	Threat	**Napa County**	Emergency communications systems, such as on Oat Hill, and fire protection infrastructure (e.g., water tanks, pumps, and hydrants) may be damaged or rendered inoperable after earthquakes, hindering emergency response.	ma-EQ-NCo-38, ma-AH-NCo-4
ps-EQ-NCo-392	Earthquake	Threat	**Napa County**	Areas of high and very high liquefaction potential are located primary in the Napa Valley, along the Napa River, other waterways, and the coastline, where a significant portion of the county population resides.	ma-DR-NCo-26, ma-EQ-NCo-37, ma-EQ-NCo-38



Slope Failure

3.3.5 Slope Failure Hazard Profile



Slope failure is a general term that describes a wide variety of mass downslope movements of soil and rock in response to gravity, including many types of landslide. Slope failures occur in a variety of ways, as falls, topples, slides, spreads, flows, and a combination of these categories, and may change from one form of failure to another during their movement. Factors that contribute to slope failures include the soil and rock strengths, orientation and steepness of elements on the slope, weathering and erosion, moisture content, recent fire activity, and human activities such as the removal of vegetation and inappropriate grading. Slope failures are a worldwide hazard, but Napa County's unique geologic conditions make large portions of the planning area particularly susceptible to many forms of slope failure. Factors that contribute to the county's slope failure susceptibility include:

- Local climatology and weather patterns that include wet winters;
- Terrain, geology, and weather patterns that cause significant erosion;
- High seismicity in the region;
- Wildfire susceptibility in the mountainous areas and burn scars on steep terrain; and
- Human activities such as vegetation removal and grading in areas of slope instability.

Slope failures can also be caused by land or aging stormwater infrastructure, particularly in the county's mountain regions. In areas burned by forest and brush fires, a lower threshold of precipitation will initiate failures. The deterioration of old timber harvest roads may also result in concentration of drainage that induces slope failure.

Although they can sometimes present a threat to human life, slope failures often result in a disruption of everyday services, including emergency response capabilities, blocking transportation routes, and impacting water supplies. When slope failure hazards affect transportation routes, which is one of the most common impacts, they are frequently expensive to clean up and can have significant economic consequences to the county.

3.3.5.1 Secondary & Compounding Hazards

There are some hazards that can trigger or exacerbate slope failure; namely, wildfire, heavy rain, and flooding. These compounding hazards are briefly discussed in this section in relation to slope failure and detailed in their respective profiles, in Sections 3.3.1, 3.3.2, and 3.3.7. Further, these compounding hazards are exacerbated by climate change (Section 3.3.9); consequently, slope failure is also exacerbated by climate change to this extent.

Heavy Rain & Flooding

Heavy rain and associated flood events can lead to landslides, mudslides, debris flows, and other types of slope failure, particularly in steep mountain watersheds where saturated soils lose cohesion and fail, as well

as stormwater infrastructure exceeding capacity or culverts failing. Flood events can undercut the toe of a slope which can remove the support for the slope and cause a landslide or rockfall.

In Napa County, landslides and other slope failure hazards pose a considerable threat to everyday services, especially emergency response capabilities and transportation facilities. Generally, the highest-susceptibility areas are in the hilly regions bordering the Napa Valley. Landslides are most frequently triggered during periods of high rainfall, typically between November and April. These heavy rainstorms, sometimes associated with an "atmospheric river" event, can deliver over one inch of rain per hour for extended time frames and trigger slope failures as well as flash floods in the county's steep, mountainous terrain.

Wildfires & Water Quality Degradation

Wildfires can create short-term and long-term impacts on landscapes by altering the soil structure, impeding its ability to absorb moisture, and destroying vegetation that binds the soil with roots and absorbs rainfall and runoff. Post-wildfire, even small rain events can create devastating mudflows, debris flows, and landslides. Areas that are currently mapped as low to moderate risk of slope failure may have elevated risk following a wildfire.

Slope failures, especially post-wildfire, can significantly degrade local water quality by introducing high sediment loads, contaminants such as metals, and excess nutrients into waterways and water bodies, causing turbidity and damage to aquatic ecosystems. (WWSC, 2023) Sedimentation in watersheds also disrupts water supply and treatment infrastructure, increasing repair and maintenance costs.

Earthquakes

Seismic waves from earthquakes can trigger landslides and other slope failures. Landslides caused by earthquakes are usually located on steeper and longer slopes than those triggered by heavy rainfall. (AGI, 2023) Earthquake-induced slope failures generally consist of rock falls and slides, lateral spreads, and slumps. Areas having the potential for earthquake-induced landslides generally occur in areas of previous landslide movement, or where local topographic, geological, geotechnical, and subsurface water conditions indicate a potential for permanent ground displacements.

3.3.5.2 Types of Slope Failure

In Napa County, there are four primary types of slope failure that pose significant threats to people, property, and critical facilities and infrastructure: landslide, debris flow, rockfall, and bank failure.

Landslide

Landslides are the downward and outward movement of slopes composed of natural rock, soils, artificial fills, or combinations thereof and are classified into many different types based on the nature of the slope materials, type of movement, and speed of the failure. They range from slow-moving rotational slumps and

earth flows, which can slowly distress structures but are less threatening to personal safety, to fast-moving rockfalls and debris flows that are a serious threat to structures and have been responsible for the most slope failure-related fatalities. Many large landslides are complex and a combination of more than one landslide type. (CalOES, 2018)

Debris Flow

According to NOAA, debris flows—also known as mudslides, mudflows, or debris avalanches—are the most common type of slope failure in Napa County. These fast-moving landslides occur when slope material becomes saturated with water. As such, they typically occur during or after intense rainfall.

Debris flows originate on steep hillsides as liquefied, shallow flows that become concentrated in steep canyons. They can accelerate from approximately 10 miles per hour to over 35 miles per hour and carry a variety of materials such as boulders, trees, and even vehicles. Debris flows vary in consistency from watery mud to thick, rocky mud with entrained debris, and can severely damage road surfaces and structures. As debris flows converge from adjacent channels, they accumulate more materials and muddy water, thus increasing in destructive force. From a geologic perspective, there are generally two types of debris flows.

- **Shallow Landslide Debris Flows:** These debris flows occur due to soil failure from oversaturation, causing the soil to liquify and run downhill. This type of debris flow generally results from a shallow landslide (less than 15 feet deep) and has a discrete initiation zone depositional area. Shallow landslides tend to occur in winter but are most likely after prolonged periods of heavy rainfall when soil materials are saturated.
- **Post-Wildfire Debris Flows:** This type of debris flow is a result of post-wildfire conditions, where burned and baked soil surfaces increase rainfall runoff that concentrates in a channel and picks up debris as it moves. Under extreme wildfire conditions, soils can be damaged to the point of becoming hydrophobic, preventing water absorption or infiltration over large areas where the fire was most intense, such as steep hillsides and drainages with dense vegetation. Post-wildfire debris flows have a less discrete initiation zone but are otherwise similar in form to a debris flow derived from hillslopes.

An example of a catastrophic post-fire debris flow is the event that occurred in Santa Barbara County on January 9, 2018, when, after the Thomas Fire, numerous canyons deposited debris flows onto urbanized alluvial fans in Montecito and Carpinteria with little warning time resulting in significant fatalities. (CalOES, 2018)

Rockfall

Rockfalls are the falling of a newly detached mass of rock from a cliff or rock outcrop or a loose rock that erodes out of unconsolidated debris on a hillside and rolls or falls down a very steep slope. Over-steepened slopes such as at roadcuts or in glaciated terrain are susceptible to rockfall due to the steep slopes that are

not highly vegetated or benched, which can help attenuate rockfall. Rock outcrops that are highly fractured or undercut by weaker rock layers are also susceptible to rockfall.

Bank Failure

Bank failure refers to the collapse or erosion of a stream or riverbank caused by hydraulic forces, geologic instability, or loss of vegetative cover. Failures can occur gradually through chronic undercutting and slumping, or suddenly during high-flow events when saturated soils give way. This hazard specifically includes stream bank failure, which is of particular concern in Napa County where many homes, businesses, and roads were developed prior to modern setback requirements. Development constructed close to streams, as well as roadways built directly along stream corridors, are especially vulnerable to erosion and failure, with numerous examples distributed throughout the county.

3.3.5.3 Policies, Plans & Regulatory Environment

State Regulatory Environment

California Building Standards Code

The California Building Code (CBC), adopted by Napa County, is another name for the body of regulations known as the California Code of Regulations, Title 24, Part 2, which is a portion of the California Building Standards Code. The CBC incorporates by reference the International Building Code (IBC) requirements with necessary California amendments. The CBC includes requirements for materials, construction methods, and maintenance standards for slope failure protection and resiliency, especially in relation to adequate drainage.

Local Regulatory Environment

Napa County General Plan

The 2023 Napa County General Plan Safety Element includes the following goals and policies to mitigate slope failure hazards. Goal SAF-7 (Safety) states: To the extent reasonable, protect residents and businesses in the unincorporated area from hazards created by earthquakes, landslides, and other geologic hazards.

- **Policy SAF-7.1:** Require a geotechnical study for new projects and modifications along known hazard areas.
- **Policy SAF-7.2:** Plant native vegetation on unstable slopes to minimize erosion and landslide potential.
- **Policy SAF-7.3:** Prohibit extensive grading where geological hazards are present.
- **Policy SAF-7.4:** Require new hillside parcels be large enough for site flexibility.
- **Policy SAF-7.5:** Prohibit road dedication where geological hazards would require excessive county maintenance.

- **Policy SAF-7.7:** Conduct regular review of slope failure maps.
- **Policy SAF-7.8:** Implement slope stabilization projects.
- **Policy SAF-7.9:** Require private critical facilities to evaluate and address geological hazard resilience.
- **Policy SAF-7.10:** Conduct seismic retrofitting for County-owned critical facilities.

Napa County Code & Hazard Evaluation Requirements

Napa County Code includes regulations prohibits construction, improvement, grading, earthmoving activity, or vegetation removal associated with the development or use of land in areas characterized by steep slopes, high erosion potential, unstable soils, combustible vegetation, or other sensitive environmental resource areas. County Code Chapter 18.108, Conservation Regulations, states that no extensive grading shall be permitted on slopes over 15% where geologic hazards are present unless the hazards are eliminated or effectively mitigated.

For development projects in slope failure-susceptible areas, the County requires the preparation of a landslide hazard evaluation for review and approval by the County. The evaluation must be prepared by a California Registered Geologist or Certified Engineering Geologist and include a filed survey as well as a report. The hazard evaluation is conducted to determine the effect of slope failures on proposed development and, more importantly, the effect of the proposed project on slope stability and the threat to both existing and proposed improvements. In addition, such evaluations provide information that helps determine how the project will affect sediment loads in from the property into nearby drainage ways.

3.3.5.4 Past Events

Napa County's slope failure hazard is amplified by its winter storm and rainfall patterns, especially between November and April, when heavy precipitation increases the likelihood of slope failure. Historical data reveals a correlation between heavy rain events and debris flows in the Napa Valley foothills and surrounding mountainous areas mostly during the winter months (Table 3-45).

There have been nine federal disaster declarations that included some kind of slope failure hazard event; however, all of these major county-wide incidents occurred in conjunction with severe winter storms and flooding. Recent climate change projections suggest these events may intensify in both frequency and magnitude over the coming decades. See the Severe Weather and Climate Change Hazard Profiles (Sections 3.3.7 and 3.3.9) for more information on heavy rain events and the compounding effects of climate change.

Table 3-45: Slope Failure and Storm Records for Napa County Since 2015

Date	Event Type	Cause	Location	Event ID
1/6/2016	Debris Flow	Heavy Rain	Woodleaf	608298
10/28/2016	Debris Flow	Heavy Rain	Rutherford	663605
1/3/2017	Debris Flow	Heavy Rain	Imola	671865
1/18/2017	Debris Flow	Heavy Rain	Lokoya	675443
1/22/2017	Debris Flow	Heavy Rain	St Helena	675772
2/7/2017	Debris Flow	Heavy Rain	Calistoga	681160
2/13/2017	Mudslides	Severe Winter Storms	Napa County	DR-4301-CA
2/20/2017	Debris Flow	Heavy Rain	Salvador	682383
3/15/2017	Mudslides	Severe Winter Storms	Napa County	DR-4305-CA
3/31/2017	Mudslides	Severe Winter Storms	Napa County	DR-4308-CA
1/8/2018	Debris Flow	Heavy Rain	Lokoya	730501
11/29/2018	Debris Flow	Heavy Rain	Woodleaf	788893
1/6/2019	Debris Flow	Heavy Rain	Salvador	796259
1/6/2019	Debris Flow	Heavy Rain	Salvador	796262
2/13/2019	Debris Flow	Heavy Rain	Angwin	800877
2/13/2019	Debris Flow	Heavy Rain	Salvador	800990
2/14/2019	Debris Flow	Heavy Rain	Salvador	801988
2/14/2019	Debris Flow	Heavy Rain	Yountville	801991
2/26/2019	Debris Flow	Heavy Rain	Krug	802703
2/26/2019	Debris Flow	Heavy Rain	Krug	802712
2/27/2019	Debris Flow	Heavy Rain	Salvador	802832
4/30/2019	Landslides, Mudslides	Severe Winter Storms	Napa County	DR-4431-CA
5/16/2019	Landslides, Mudslides	Severe Winter Storms	Napa County	DR-4434-CA
1/26/2021	Debris Flow	Heavy Rain	Yountville	932426
1/8/2023	Mudslides	Severe Winter Storms	Napa County	EM-3591-CA
1/13/2023	Landslides, Mudslides	Severe Winter Storms	Napa County	DR-4683-CA
3/9/2023	Landslides, Mudslides	Severe Winter Storms	Napa County	EM-3592-CA
4/2/2023	Landslides, Mudslides	Severe Winter Storms	Napa County	DR-4699-CA

Source: NWS Storm Events Database, FEMA Disaster Declarations Database

3.3.5.5 Location & Extent

The best available predictor of where movement of slides and earth flows might occur is the location of past movements. Past slope failures can be recognized by their distinctive topographic shapes, which can remain in place for thousands of years. Most landslides recognizable in this fashion range from a few acres to several square miles, show no evidence of recent movement, and are not currently active. A small proportion of them may become active in any given year, with movements concentrated within all or part of the landslide masses or around their edges.

Recognizing ancient dormant mass movement sites is important to identify current areas susceptible to flows and slides, because they can be reactivated by earthquakes or exceptionally wet weather. Those ancient scars also consist of broken materials, frequently involve disruption of groundwater flow, and are vulnerable to construction-triggered sliding.

Figure 3-36 shows low, moderate, and high landslide susceptibility in Napa County from the California Geological Survey (CGS), and Table 3-46 describes these classifications. This map should be used with caution, however. Some areas labeled as low or moderate risk may still be highly unstable due to subsurface conditions or poor drainage, while some areas mapped as high risk may be stabilized through engineering or natural conditions. As a result, site-specific geotechnical investigations are often required prior to development, grading, or mitigation projects to accurately determine slope stability.

Slope failures in Napa County are located primarily in the foothills and steeper terrain of the two mountain ranges that border the Napa Valley: the Vaca Range to the east and Mayacamas to the west. There is a long history of geologic activity in the region, from the formation of these mountain ranges to the megaslides off the Vaca Mountains that formed the hills and knolls seen in the valley floor today. The valley's topography changes with its length, from the windswept estuarine flats and gentle hills in the south to the valley's narrow tip at the town of Calistoga, cradled between the sheer walls of the Palisades at the foot of Mount St. Helena to the east and the forested Mayacamas Mountains to the west.

The locations and types of slope failures that occur in Napa can be summarized as: rivers and streams throughout the county experience shallow bank failures, rotational landslides, and lateral spreading; or steep slopes and drainages experience large, deep composite landslides and debris flows.

Table 3-46: Slope Failure Susceptibility Classifications

Susceptibility	Native Class	Description
Low	**1-5**	These classes express the generalization that on very low slopes, landslide susceptibility is low even in weak materials, and that landslide susceptibility increases with slope and in weaker rocks.
Medium	**6-7**	Very high landslide susceptibility, classes VIII, IX, and X, includes moderate and steep slopes in hard rocks and weak rocks.
High	**8-10**	Very high landslide susceptibility, classes VIII, IX, and X, includes very steep slopes in hard rocks and moderate to very steep slopes in weak rocks.

Source: CGS Susceptibility to Deep-Seated Landslides in California

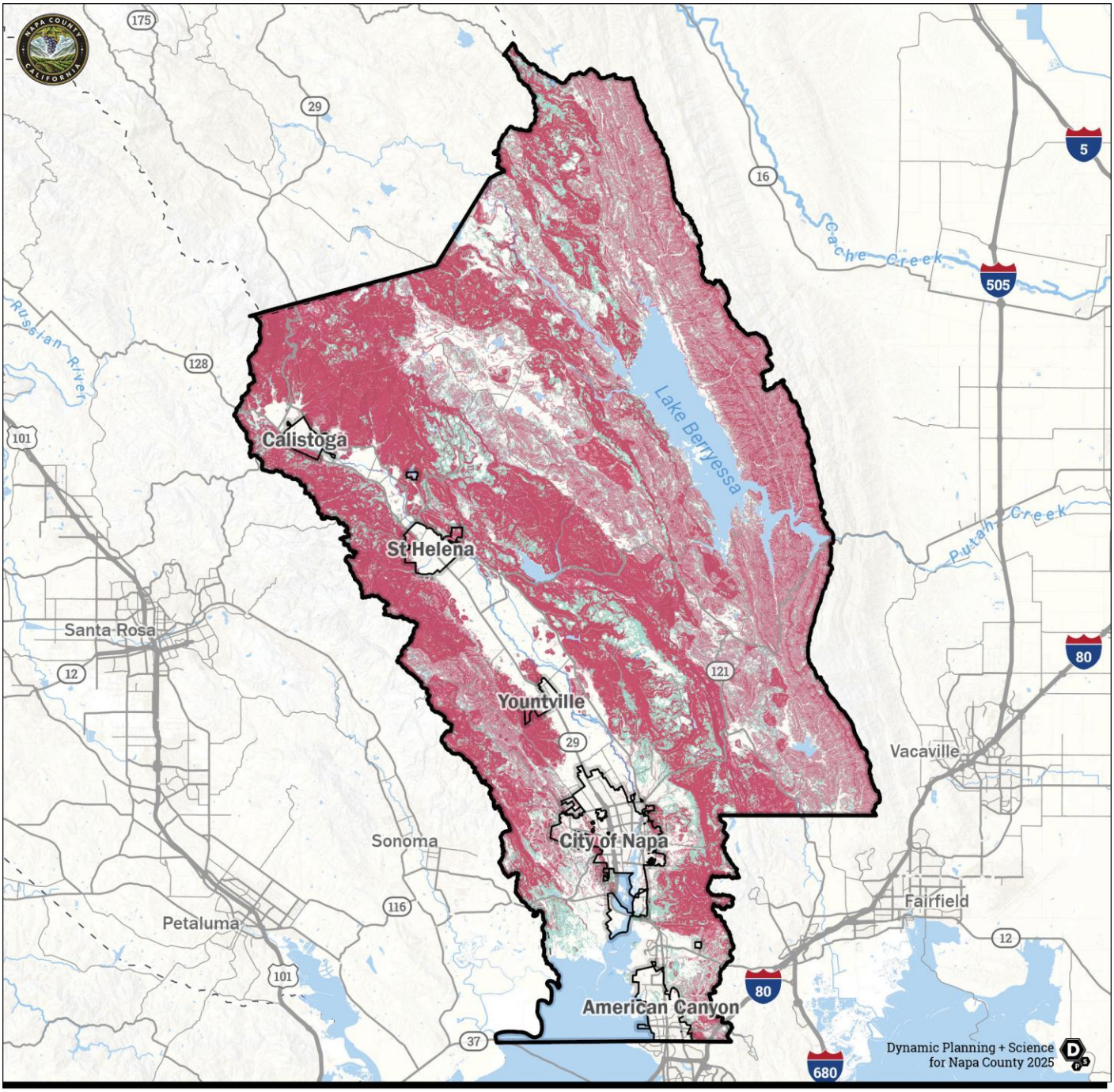


Figure 3-36: Napa County Landslide Susceptibility

3.3.5.6 Frequency & Probability of Future Occurrences

Measuring the frequency and probability of slope failure hazards requires a combination of historical data analysis, geologic mapping, climate trends, and probabilistic modeling, as these hazards are influenced by factors such as precipitation, seismic activity, topography, and human development. To assess hazard frequency, researchers examine past events recorded in geological surveys, historical documents, and remote sensing data. For example, slope failure occurrences in Napa County are often linked to intense rainfall, and analyzing past precipitation patterns and climate change models helps estimate future probabilities. Probabilistic models, such as landslide susceptibility mapping, incorporate variables like slope gradient, soil composition, and vegetation cover to predict the likelihood of future events.

Slope failures are most frequently triggered in periods of high rainfall during the winter months, November to April, in Napa County. The hazard is greatest in steeply sloped areas, although slides may occur on slopes of 15% or less if the conditions are right. Slope steepness and underlying soils are the most important factors affecting the landslide hazard. However, surface and subsurface drainage patterns also affect the hazard, and vegetation removal can increase the likelihood of slope failure. Human activities contribute to instability through grading of steep slopes, overloading with artificial fill, extensive irrigation, construction of impermeable surfaces, and excessive groundwater withdrawal. (USGS, 2020)

As discussed in Section 3.3.5.1, other natural hazards such as earthquakes, heavy rain, flood, or wildfire, can also trigger slope failures or compound their impacts. As such, slope failure frequency is often related to the frequency of these other hazards. Seismic hazards, including fault movements and ground shaking, are assessed using data from the USGS and other monitoring networks. The probability of debris flows is often measured through field assessments and computer simulations that consider factors such as freeze-thaw cycles, extreme weather events, and wildfire burn scars, like the LNU Lightening Complex Fire, which has increased erosion and debris flow risks in affected areas.

Slope failures will continue to affect the county, especially during El Niño weather patterns and atmospheric river events. El Niño weather patterns will continue approximately every seven years, and the San Andreas Fault, as well as other faults, will generate earthquakes, which will contribute to the formation of landslides. **The probability of slope failure occurring in Napa County is highly likely (100% annual probability).**

Failure is more likely in areas that have recently experienced flooding or wildfires, but it can occur on any susceptible terrain given the right conditions—such as "ideal" underlying geology, steeper slopes, and saturation. Areas with unstable conditions, like over-steepened slopes, may regularly experience debris flows during heavy rainfall. Additionally, decadal variance and climate change driving increase in frequency and intensity of heavy rain events as well as changes in vegetation composition and wildfire, which could impact slope stability in unpredictable ways.

3.3.5.7 Severity

Slope failures, including landslides, debris flows, and bluff failures, pose significant hazards in Napa County, often disrupting essential services and emergency response capabilities. The severity of slope failure hazards depends on local geologic and soil conditions. Hazards are greatest in steeply sloped areas, although slides may occur on slopes of 15% or less if the conditions are right. Slope steepness and underlying soils are the most important factors affecting landslide hazards. However, surface and subsurface drainage patterns also affect landslide hazards, and vegetation removal can increase the likelihood of a landslide.

The primary impacts from slope movement are on roads and any underlying or aboveground utilities including water and sewer infrastructure. While landslides occasionally threaten human life, their more common impact lies in blocking transportation routes, damaging buildings and infrastructure, damming creeks, and contaminating water supplies. The cleanup of these hazards on transportation routes can be costly and have substantial economic repercussions for the county.

A significant amount of linear infrastructure (or lifelines) are exposed to slope failure, as further discussed in the vulnerability assessment section. Impacts to these lifelines can include:

- **Roads:** Access to major roads is crucial to life-safety, response, and recovery operations after a disaster event. Landslides can block egress and ingress on roads, causing isolation for neighborhoods, traffic problems, and delays for public and private transportation. This can also result in economic losses for businesses.
- **Bridges:** Landslides can significantly impact bridges, by knocking out bridge abutments or weakening the soil supporting them. Debris flows can also clog drainages at choke points such as bridges with downed trees, boulders, and other materials picked up along their path, triggering additional flooding impacts.
- **Power Lines:** Power lines are generally elevated above steep slopes, but the towers and poles supporting them can be subject to landslides. A landslide could trigger failure of the soil underneath support structures, causing them to collapse and rip down the lines. Power and communication failures due to landslides can create problems for first responders, vulnerable populations, and businesses.
- **Water and Sewer Pipes:** The underground pipes delivering water or collecting raw sewage can be severely damaged if disturbed by a slope failure, leading to loss of service and contamination of the surrounding environment and water supply. These failures can impact agricultural users, businesses, residents, and tourism.

3.3.5.8 Warning Time

Some slope failure hazards occur slowly, including creeping slides and bank erosion, but can have significant property or health consequences. Identifying these hazards generally requires site-specific analysis to determine if the site's soil and geology are susceptible to failure and to identify the most relevant and prudent mitigation measures. For these types of slope failure hazards, warning time is long.

However, for other types of slope failure, such as sudden and fast-moving debris flows, warning time is often very short. Identifying areas with known hazards (i.e., where past events have occurred) or with characteristics conducive to these hazards can help with preparedness when triggering events like prolonged or intense rainfall occur. Post-fire debris flow mapping is one of the primary ways in which Napa County has worked to identify potential hazard areas for proactive mitigation and evacuation ahead compounding events like atmospheric rivers. While this identification does not increase the warning time for an actual failure event, it does enhance proactive responses to potential triggers, save lives, and help prevent damage. (Manconi, 2016)

3.3.5.9 Slope Failure Vulnerability Assessment

Past experience has shown that many areas of the county are susceptible to the effects of slope failures. Most of the damage caused by landslides has been to privately-owned structures; although, a fair number of county roads are also at risk. Napa County's underlying seismic activity and diverse topography, which includes hilly and mountainous terrain, makes certain communities and infrastructure particularly vulnerable to slope failure hazards. The exposure of both population and assets to these hazards depends on factors such as development patterns, land use, and the presence of critical facilities and infrastructure in high-risk areas.

Figure 3-37 summarizes exposure to landslide susceptibility for population, property, and critical facilities and infrastructure in Napa County.

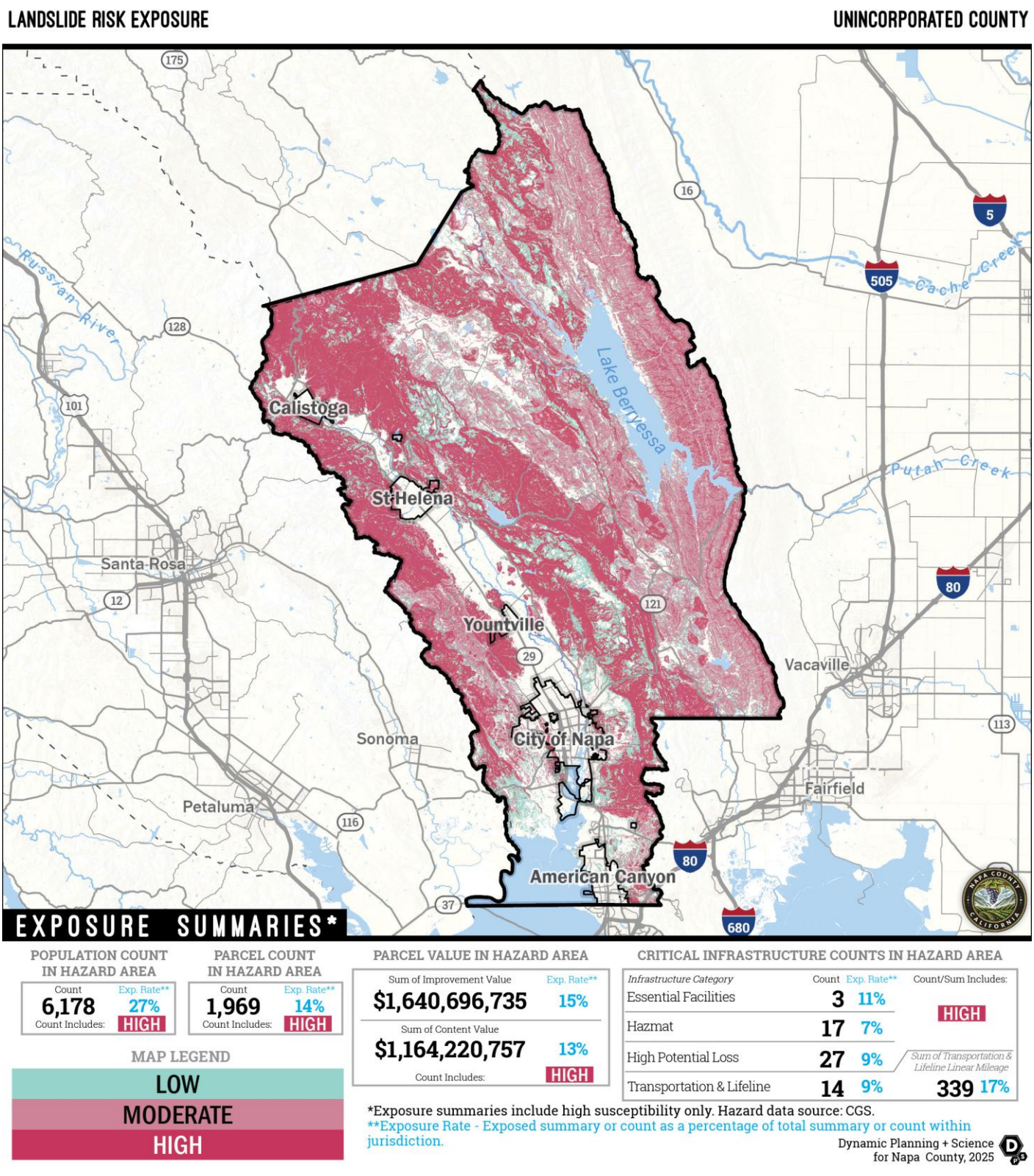


Figure 3-37: Exposure Summary – Napa County Slope Failure Risk

3.3.5.9.1 Population

Even though Napa County's population is primarily located in the valley, where slope failure risks are lower, just under 12,000 people, or about 53% of the unincorporated county population, are exposed to some level of slope failure susceptibility area as identified by CGS (Figure 3-38 and Table 3-47). Over one-quarter of the population is exposed to high risk.

Exposed populations are located in the foothills and steeper terrain of the Vaca and Mayacamas Mountain Ranges to the east and west of the valley.

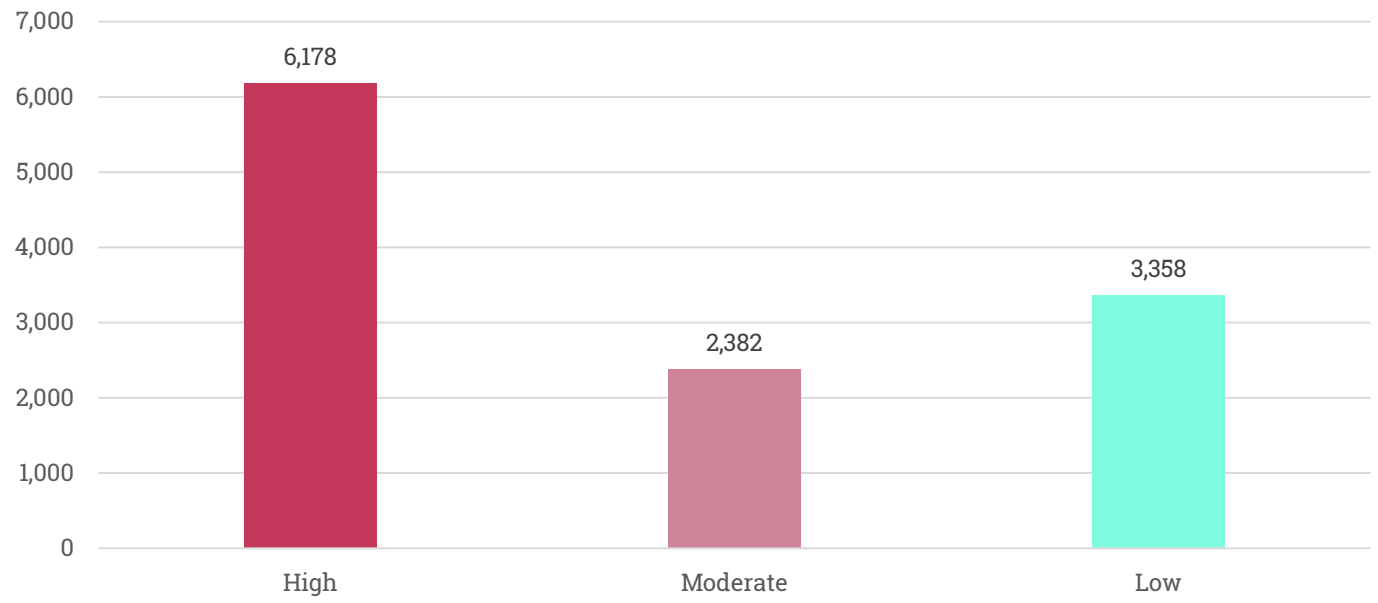


Figure 3-38: Napa County Population Exposure to Slope Failure

Table 3-47: Napa County Population Exposure to Slope Failure

	Total Population
Unincorporated County	22,468

Landslide Susceptibility	Population Count	% of Total
High	6,178	*27.49%*
Moderate	2,382	*10.60%*
Low	3,358	*14.95%*
Total	**11,918**	**53.04%**

Disproportionately Impacted Populations

Certain populations in Napa County may be disproportionately impacted by slope failure hazards, particularly in areas where landslide susceptibility intersects with socially vulnerable communities. Slope failure risk is generally concentrated in the County's hillside and mountainous areas, including the eastern and northern portions of the planning area such as the wildland-urban interface near Lake Berryessa, Angwin, Pope Valley, and other steep terrain locations. These areas often have limited access routes, increasing the potential for isolation when landslides block roadways or disrupt critical infrastructure.

As described in Section 1.5.3, individuals with access and functional needs, including older adults, persons with disabilities, and those with limited mobility, may face increased challenges during slope failure events, particularly where evacuation routes are constrained or emergency response access is limited. Residents in hillside areas may also experience disruptions to essential services such as power, water, and transportation, which can have more severe consequences for medically dependent individuals or those requiring regular access to care.

In addition, lower-income households and renters may be more vulnerable to slope failure impacts due to limited financial capacity to implement mitigation measures such as drainage improvements, slope stabilization, or vegetation management. Rural and hillside properties may also require ongoing maintenance to reduce landslide risk, which can present financial and logistical challenges for some property owners.

Transportation limitations further compound vulnerability in these areas. Many hillside communities rely on a limited number of access roads, and landslides have the potential to isolate residents from emergency services, employment centers, and essential resources. This risk is particularly significant for individuals without reliable transportation or those who may require additional assistance to evacuate.

These combined physical and social factors indicate that while slope failure hazards are geographically concentrated, their impacts may be disproportionately experienced by populations with reduced capacity to prepare for, respond to, and recover from hazard events. As such, targeted mitigation strategies, outreach, and emergency planning efforts are necessary to support vulnerable populations in high-risk areas.

3.3.5.9.2 Property

Property vulnerability to slope failure in Napa County is primarily influenced by topography, soil conditions, and proximity to steep slopes, waterways, and areas of recent wildfire activity. Landslides and debris flows are the primary slope failure hazards and can result in significant structural damage to buildings and infrastructure, particularly in areas with unstable soils, high erosion potential, or wildfire burn scars.

Slope failure hazards are most prevalent in the County's hillside and mountainous regions, where steep terrain and variable geologic conditions increase susceptibility to ground movement. Buildings located on or below steep slopes are at elevated risk of damage due to slope instability. Landslides can undermine foundations, damage or collapse retaining walls, and shift structures downslope, resulting in costly repairs

or complete structural loss. Debris flows—especially in post-wildfire conditions—pose an additional threat by rapidly mobilizing soil, rock, and vegetation, which can bury structures, damage roadways, and disrupt critical infrastructure.

To quantify property exposure, parcel-level data from the Napa County Assessor's Office was analyzed using GIS to identify structures located within areas of mapped landslide susceptibility. Table 3-48 summarizes the number of exposed parcels and associated market and content values within high, moderate, and low landslide susceptibility zones.

Table 3-48: Napa County Property Exposure to Slope Failure

	Total Parcels	Total Market Value ($)	Total Content Value ($)	Total Value ($)
Unincorporated County	13,668	$11,215,199,644	$9,248,691,039	$20,463,890,683

Landslide Susceptibility	Parcel Count	% of Total	Market Value Exposure ($)	Content Value Exposure ($)	Total Exposure ($)	% of Total
High	1,969	*14.4%*	$1,640,696,735	$1,164,220,757	$2,804,917,492	*13.7%*
Moderate	1,497	*11.0%*	$910,986,195	$598,065,540	$1,509,051,735	*7.4%*
Low	2,896	*21.2%*	$2,158,569,579	$1,522,890,346	$3,681,459,925	*18.0%*
Total	**6,362**	**46.5%**	**$4,710,252,509**	**$3,285,176,643**	**$7,995,429,152**	**39.1%**

More than 46% of parcels in the unincorporated county are located within mapped landslide susceptibility zones, representing nearly $8.0 billion in combined market and content value exposure. Properties within high susceptibility areas account for a significant share of this exposure and are at the greatest risk of damage from slope instability and associated hazards.

The predominant land uses within these areas include single-family residential, vacant land, and manufactured housing, indicating that slope failure hazards primarily threaten residential properties and associated infrastructure. Damage to these properties may result not only from direct ground movement, but also from secondary impacts such as loss of access, damage to utilities, and erosion-related degradation over time.

Overall, the concentration of development within landslide-prone areas highlights the potential for localized but significant property damage during slope failure events, particularly where steep slopes, wildfire impacts, and intense precipitation combine to increase instability.

3.3.5.9.3 Critical Facilities & Infrastructure

Numerous critical facilities and extensive segments of infrastructure in Napa County are located within areas susceptible to slope failure hazards. These hazards are most prevalent in hillside and mountainous regions of the County, where steep terrain, variable geologic conditions, and wildfire impacts increase the likelihood of landslides and debris flows.

Critical infrastructure, including transportation networks, utilities, and essential service facilities, is particularly vulnerable to slope failure due to its linear nature and frequent placement along slopes and drainage corridors. Roadways, bridges, and utility alignments are often constructed in or adjacent to steep terrain, making them highly susceptible to ground movement, erosion, and debris deposition.

Slope failures can significantly disrupt transportation systems by blocking roadways, damaging bridges, and isolating communities. Even small landslides can render roads impassable, delaying emergency response and limiting access for residents and service providers. Many hillside areas in Napa County rely on a limited number of access routes, increasing the potential for isolation during and after a slope failure event.

Utility infrastructure is also highly vulnerable. Ground movement can damage or sever underground pipelines, transmission lines, and communication systems, resulting in service disruptions. Water and wastewater systems located on unstable slopes may rupture, causing service outages and potential environmental impacts. Similarly, power and communication infrastructure, including transmission lines, substations, and towers—may be displaced or damaged, increasing the likelihood of prolonged outages.

Table 3-49 summarizes the number and types of critical facilities located within areas of varying landslide susceptibility. Over 200 critical facilities are located within mapped landslide susceptibility zones, including essential facilities, high potential loss facilities, and lifeline infrastructure components. Notably, facilities such as fire stations, hospitals, dams, communication towers, and hazardous materials sites are among those exposed to slope failure risk.

Table 3-49: Napa County Critical Facilities Exposure to Slope Failure

Critical Infrastructure - Landslide Susceptibility			
Infrastructure Type	High	Moderate	Low
Essential Facilities	3	4	2
EOC	-	-	-
Fire Station	2	4	1
Hospital	1	-	-
Law Enforcement	-	-	1
High Potential Loss	27	27	40
Adult Residential Care	-	-	-
Child Care Center	-	2	-

Church	3	1	5
Communication Tower	5	1	6
Dam	9	8	8
Emergency Shelter	-	2	-
Farm Worker Housing	-	1	-
Historic Building	2	1	2
Library	-	-	1
Mobile Home Park	-	1	-
Res Elder Care Facility	-	1	2
Private School	-	-	-
Public School	-	-	-
Real Property Asset	8	9	16
Transportation and Lifeline	14	37	12
Airport	-	2	1
Bridge	2	30	1
Bus Stop	-	-	-
HMMWC Asset	-	-	-
HMMWC Dam	-	-	-
HMMWC Hydrant	-	-	-
NG Station	-	-	1
Power Plant	3	-	-
Substation	2	1	2
Wastewater Treatment Facility	2	2	2
Water Supply Intake	-	-	-
Water Tank	4	2	3
Water Treatment Facility	1	-	2
Hazmat	17	18	26
Geotracker CleanupSite	-	1	-
HWTS Active Facility	16	16	26
Landfill	1	1	-
Grand Total	**61**	**86**	**80**

**Real Property Assets are digitized insurance rolls for demonstrating value and ownership and may have overlapping points with other categories such as fire stations and law enforcement.*

In addition to point-based facilities, a substantial amount of linear infrastructure is exposed to slope failure hazards. Table 3-50 summarizes miles of infrastructure located within landslide susceptibility zones, including roads, transmission lines, pipelines, and rail corridors. Of particular note, hundreds of miles of

roadway—including residential roads, service roads, and secondary roads—are located within moderate to high susceptibility areas.

Table 3-50: Napa County Critical Infrastructure Exposure to Slope Failure

Lifelines (miles) - Landslide Susceptibility			
Infrastructure Type (Linear)	High	Moderate	Low
Levee	0.1	1.1	0.0
NG Pipeline	0.6	4.9	5.5
Railroad	0.1	1.0	0.2
Transmission Line	45.2	15.5	17.1
Street OSM	292.6	244.2	339.1
Highway & Interstate	0.8	0.8	0.5
Major Road	7.4	7.0	8.2
Residential Road	50.0	38.9	62.3
Road - Secondary	16.9	24.6	15.0
Road - Tertiary	26.9	25.7	33.6
Service Road	170.5	129.3	194.1
Unclassified	20.0	18.0	25.4
Grand Total	**338.6**	**266.7**	**361.9**

In total, more than 600 miles of infrastructure are located within mapped landslide susceptibility zones, with a significant portion in areas of moderate to high risk. Because transportation and utility systems are highly interconnected, damage to a single segment can have cascading impacts across the broader network, affecting emergency response, service delivery, and economic activity.

Overall, the extent of critical facility and infrastructure exposure highlights the potential for localized but severe disruptions resulting from slope failure events. Impacts may include loss of access to emergency services, prolonged utility outages, and damage to key community assets, particularly in areas where steep terrain and limited redundancy increase system vulnerability.

3.3.5.10 Development Trends

Napa County's development patterns are shaped by a combination of geographic constraints, regulatory policies, and long-standing growth management strategies. Much of the County's recent and future development is expected to occur within incorporated cities and established urbanized areas, while rural and hillside regions, where slope failure susceptibility is highest, remain subject to more limited and carefully regulated development.

The Napa County General Plan and associated policies include provisions to guide development in areas susceptible to geologic hazards, including slope failure. These policies, along with County Code Title 16 and the California Building Standards Code, require site-specific geotechnical investigations and the incorporation of appropriate engineering measures for development proposed in areas with potential slope instability. Such measures may include slope setbacks, drainage controls, grading restrictions, and structural stabilization techniques.

Despite these regulatory frameworks, development continues to occur in areas with inherent landslide susceptibility, particularly in rural residential and hillside settings. Existing parcels of record may be developed in accordance with current standards, but these areas often present ongoing challenges due to steep terrain, variable soil conditions, and limited infrastructure redundancy. As a result, even well-designed development may retain an elevated level of risk relative to areas outside of slope failure zones.

Future growth in Napa County is expected to continue emphasizing infill development and redevelopment within established communities, consistent with regional growth management objectives. However, some level of rural residential development and infrastructure expansion in hillside areas is anticipated. These projects will require continued integration of geologic assessments and engineering solutions to minimize slope failure risk.

Advances in technology, including high-resolution topographic mapping (e.g., LiDAR), improved geotechnical analysis, and remote monitoring systems, are enhancing the County's ability to identify and manage slope instability. These tools support more informed planning decisions and can improve the effectiveness of mitigation measures over time.

Development Impacts

Development within or adjacent to areas of slope failure susceptibility has the potential to influence both the likelihood and consequences of slope-related hazards. Grading activities, vegetation removal, and changes to natural drainage patterns associated with development can increase slope instability if not properly designed and managed. Additionally, the expansion of roads, utilities, and other infrastructure into hillside areas may introduce new vulnerabilities, particularly where systems lack redundancy or are exposed to ground movement.

As development continues in areas with existing landslide susceptibility, the overall exposure of property and infrastructure to slope failure hazards may increase. While regulatory requirements and engineering practices are intended to reduce risk, they cannot eliminate it entirely. This is particularly true in areas affected by compounding factors such as wildfire and intense precipitation, which can significantly alter slope stability conditions over time.

The concentration of development in susceptible areas may also increase the potential for localized but high-consequence impacts, including damage to residential structures, disruption of transportation

networks, and loss of utility services. In hillside areas with limited access routes, slope failures may isolate communities and delay emergency response, further increasing risk.

Overall, while Napa County's regulatory framework helps manage development in hazard-prone areas, continued growth in or near slopes will require ongoing attention to geologic conditions, infrastructure resilience, and long-term maintenance of mitigation measures to limit increases in vulnerability.

3.3.5.11 Climate Change Impacts

Slope failures, including landslides and debris flows, are a persistent hazard in Napa County due to its steep terrain, variable geologic conditions, and history of intense winter storm events. These hazards are most pronounced in hillside and mountainous areas, particularly in the eastern and northern portions of the County. Climate change is expected to exacerbate slope failure risks by increasing the frequency and intensity of extreme precipitation events, extending periods of soil saturation, and compounding erosion in areas affected by wildfire burn scars. These conditions increase the likelihood of both rapid slope failures, such as debris flows, and slower forms of ground movement, posing ongoing risks to structures, infrastructure, and essential services.

Direct Impacts

Landslides and debris flows can damage or obstruct transportation routes, particularly in hillside areas where roads are often constructed along steep slopes or within narrow corridors. Even relatively small slope failures can block roadways, limiting access for residents and delaying emergency response. Larger events may result in structural damage to roadbeds, bridges, and adjacent properties.

Slope instability can also undermine building foundations, retaining structures, and other improvements located on or near steep slopes. In some cases, this may result in partial or complete structural failure. Properties located near drainage channels or at the base of slopes may be especially vulnerable to debris flows, which can inundate structures with mud, rock, and vegetation.

Water, wastewater, and stormwater infrastructure are also susceptible to damage from slope movement. Landslides can rupture pipelines, damage drainage systems, and increase sediment loads in surface water supplies, affecting water quality and system reliability. These impacts may lead to service disruptions, increased maintenance costs, and potential environmental consequences.

Secondary Hazards

Slope failure hazards in Napa County are often compounded by secondary processes, particularly in areas affected by wildfire. Burn scar areas are especially vulnerable to debris flows, as the loss of vegetation reduces slope stability and increases runoff during storm events. Intense rainfall on these areas can trigger rapid slope failures with little warning.

Inadequate or poorly maintained drainage systems can further increase slope failure risk by allowing water to accumulate and saturate soils. Blocked culverts and channels may cause water to overtop or redirect, triggering localized slope instability. Additionally, landslide debris can obstruct waterways and drainage infrastructure, contributing to localized flooding, erosion, and additional slope failures downstream.

Disproportionate Considerations (Optional if you want to keep it here, otherwise remove)

While slope failure hazards are geographically concentrated, their impacts may be amplified in areas where access is limited and infrastructure redundancy is low. Disruptions to transportation and utilities can have cascading effects, particularly in rural and hillside areas where alternative routes and services are limited.

3.3.5.12 Slope Failure Hazard Problem Statements

As part of the mitigation action identification process, the Napa County Planning Team developed areas of concern (i.e., problem statements) that summarize the county's most pressing slope failure-related vulnerabilities and challenges. The problem statements were developed based on the updated risk assessment and vulnerability analysis contained herein, as well as the team's local knowledge and experience and community input. The problem statements address a broad spectrum of concerns, from direct impacts on residents and vulnerable populations to threats to critical infrastructure and long-term recovery.

These problem statements are not intended to be all-encompassing or to describe each and every issue associated with slope failure hazards. Instead, they highlight the most urgent concerns that can be addressed within the scope of this MJHMP. Each statement will be linked to at least one mitigation action, ensuring that identified needs are met with specific, measurable, and equitable solutions. Table 3-51 presents the slope failure problem statements for Napa County, along with their associated areas of concern and reference numbers for cross-linking to the mitigation actions in Table 4-4.

Table 3-51: Napa County Slope Failure Hazard Problem Statements

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-SF-NCo-151	Slope Failure	Threat	**Napa County**	Napa County has many areas susceptible to landslides but lacks comprehensive mapping of slope failure risks.	ma-SF-NCo-84, ma-AH-NCo-6, ma-DR-NCo-26
ps-SF-NCo-152	Slope Failure	Threat	**Napa County**	Over 600 miles of roads and other critical infrastructure and almost 150 critical facilities are located in moderate or high landslide susceptibility areas, including the Angwin VFD storage facility, threatening emergency response capabilities.	ma-SF-NCo-85, ma-SF-NCo-84
ps-SF-NCo-396	Slope Failure	Impact	**Napa County**	Slope failures can damage or destroy critical infrastructure, including access routes and transmission lines, isolating communities and disrupting emergency and other services.	ma-SF-NCo-84, ma-SF-NCo-85



Drought

3.3.6 Drought Hazard Profile



California's water resources have been stressed by periodic drought cycles, but climate change is expected to increase the frequency, severity, and duration of droughts across the state. While the length of drought periods is always in question, it is certain that California and Napa County will continue to be impacted by drought. (California Drought Contingency Plan, 2021)

Napa County surface and groundwater resources provide drinking water for agriculture, residents and visitors, critical habitat to numerous plant and animal species, and opportunities for recreational and commercial activities. Like many other areas of California, the county faces water resource challenges, including inadequate water supply particularly during droughts, impaired water quality, over-drafted groundwater basins, depleted streams, and degraded riparian habitat.

Napa County has four water sources: surface, imported, groundwater, and recycled. The majority of Napa County's potable water supply is locally derived from surface water. For example, the City of Calistoga relies on Kimball Reservoir while the City of Napa relies on Lake Hennesy. Certain jurisdictions such as the City of American Canyon and the City of Napa receive State Water Project water or City of Vallejo water. Agricultural and rural users often rely on groundwater wells. Certain jurisdictions, including the Cities of American Canyon, Calistoga, and Napa also have recycled water systems for non-potable uses such as irrigation.

Drought has impacted almost every county in California at one time or another, causing more than $2.6 million in damage. Droughts exceeding three years are relatively rare in northern California, the source of much of the state's water supply. The 1929 to 1934 drought established the criteria commonly used in designing storage capacity and yield for large northern California reservoirs. The driest single year in California's measured hydrologic history was 1977.

Past experience shows that drought impacts in California are felt first by those most dependent on annual rainfall: agencies fighting wildfires, farmers and ranchers, rural residents relying on wells, or small water systems lacking a reliable water source.

Most of California's precipitation comes from storms moving across the Pacific Ocean. The path followed by the storms is determined by the position of an atmospheric high-pressure belt that normally shifts southward during the winter, allowing low pressure systems to move into the state. On average, 75% of California's annual precipitation occurs between November and March, with 50% occurring between December and February. If a persistent Pacific high-pressure zone takes hold over California mid-winter, the water year tends to be dry.

A typical water year produces about 100 inches of rainfall over the North Coast, 50 inches of precipitation (combination of rain and snow) over the Northern Sierra, 18 inches in the Sacramento area, and 15 inches in the Los Angeles area. In extremely dry years, these annual totals can fall to as little as one half, or even one third of these amounts.

Napa County and other public agencies have been monitoring local groundwater resources since the mid 1900s. Based on recent studies and bi-annual monitoring of groundwater levels in over 100 volunteered wells, level trends in the Napa Valley Sub-basins of the Napa-Sonoma Valley Groundwater Basin are stable in the majority of wells with long-term records. Although some wells show a response to drought conditions, levels in recent drought years are generally higher than those during the 1976 to 1977 drought. Elsewhere in the county, long-term groundwater level records are more limited, with the exception of the Milliken-Sarco-Tulocay (MST) Subarea. Groundwater level declines observed in the MST Subarea as early as the 1960s and 1970s have stabilized since about 2008. The observation that groundwater level responses differ within the MST Subarea and even within the north, central, and southern sections of this subarea indicate that localized conditions, whether geologic or anthropogenic in nature, might be the primary influence on conditions in the subarea. (What is Known About Groundwater, n.d.)

3.3.6.1 Secondary & Compounding Hazards

Drought is compounded by climate change and contributes to secondary hazards like wildfire. These hazards are briefly discussed in this section in relation to drought; detailed assessments of wildfire and climate change are found in their respective profiles, in Sections 3.3.1 and 3.3.9.

Climate Change

The long-term effects of climate change on regional water resources are unknown, but global water resources are already experiencing stresses without climate change, including growing populations, increased competition for available water, poor water quality, groundwater overdraft, and aging urban water infrastructure. With a warmer climate, droughts could increase in severity, frequency, and duration, contributing to declining streamflow in surface waterbodies, which in turn, reduces groundwater recharge as well as water availability for humans, wildlife, and vegetation. It can also contribute to sea level rise-driven seawater intrusion into aquifers.

According to the UC Davis Center for Watershed Sciences, water shortages in 2016 were projected to cost the agricultural industry a total of $550 million in direct costs and 1,815 in lost jobs. More frequent extreme events such as droughts could end up being more cause for concern than the long-term change in temperature and precipitation averages.

Wildfire

The secondary hazard most associated with drought is wildfire. A prolonged lack of precipitation stresses and dries out vegetation, which becomes increasingly susceptible to ignition as the duration of the drought extends. Increased temperatures from climate change during drought conditions further intensify wildfire danger by warming and accelerating the desiccation of vegetative fuels. As climate conditions shift toward longer fire seasons and drier fuels, secondary wildfire effects from drought are expected to increase in both frequency and severity across Napa County. A changing climate is expected to subject forests to increased

stress due to drought, disease, invasive species, and insect pests (e.g., glassy-winged sharpshooter and sudden oak death). These stressors are likely to make forests more vulnerable to catastrophic fire.

3.3.6.2 Policies, Plans & Regulatory Environment

State Regulatory Environment

State Water Resources Control Board

Through a ballot initiative in the early 20th century, state law-makers passed a Constitutional amendment declaring that California's water resources "shall put water to the highest beneficial use possible and shall not waste water or use it unreasonably." In 1967, the State Legislature recognized that California would not have enough clean water for agricultural, municipal, industrial, environmental, and other uses unless water quality and quantity decision-making were coordinated. It was at that time that the State Water Resources Control Board (State Water Board) was created and given the broad authority and responsibility to protect water quality, balance competing demands on water resources, and attempt to resolve decades-long water disputes.

This new regulatory board merged the functions of two previous state boards: the State Water Quality Control Board and the State Water Rights Board. The former had its roots in the late 1940s, when legislators created a streamlined regulatory agency to address rising water quality problems with the state's explosive industrial and population growth. A water rights commission, which preceded the water rights board, was created in the early 1900s to arbitrate and resolve the state's water battles, which began during the 1849 Gold Rush. Back then, prospectors from throughout the world raced to the Sierra Nevada Mountains to stake their claims, using the cold mountain streams as a tool to unearth gold.

Today the five-member State Water Board allocates water rights, adjudicates water right disputes, develops statewide water protection plans, establishes water quality standards, and guides the nine Regional Water Quality Control Boards located in California's major watersheds. The Regional Boards, each comprised of seven members, serve as the front-line for state and federal water pollution control efforts. In Napa County, the San Francisco Bay Area Regional Water Quality Board has jurisdiction.

Today's challenges are California's rapid population growth, and the continuing struggle over water flows. The State Water Board faces tough demands: to fix ailing sewer systems; build new wastewater treatment plants; and tackle the cleanup of underground water sources harmed by the technology and industry that has catapulted the state into global prominence. (State Water Board, 2018)

California Sustainable Groundwater Management Act (SGMA)

In 2014, Governor Jerry Brown signed into law a package of senate bills (SB) and assembly bills (AV), including SB 1168, AB 1739, and SB 1319, collectively called the Sustainable Groundwater Management Act (SGMA). SGMA requires governments and water agencies of high and medium priority basins to halt

overdraft and bring groundwater basins into balanced levels of pumping and recharge. Under SGMA, these basins should reach sustainability within 20 years of implementing their sustainability plans. For critically overdrafted basins, that will be 2040. For the remaining high and medium priority basins, 2042 is the deadline.

Executive Order B-37-16

Governor Jerry Brown issued Executive Order B-37-16, Making Water Conservation a California Way of Life, in 2016 that included, among other directives, drought hazard and planning related actions. The order established long-term, permanent water conservation measures in response to the ongoing drought and changing climate, and mandated the California State Water Resources Control Board permanently prohibit practices like using hoses to clean driveways and sidewalks, overwatering lawns, and serving water by default in restaurants, with a focus on urban water use. In addition, directive number 10 in the order specified that, "for areas not covered by a Water Shortage Contingency Plan, the [board] shall work with counties to facilitate improved drought planning for small water suppliers and rural communities."

In 2016, the State Water Board adjusted emergency water conservation regulations indefinitely in recognition of the differing water supply conditions and ongoing drought across the state. Executive Order B-37-16 updates temporary emergency water restrictions and transitions to permanent, long-term improvements in water use by using water more wisely; eliminating water waste; strengthening local drought resilience; and improving agricultural water use efficiency and drought planning.

California Water Plan

The California Water Plan, which dates back to the late 1800s, is the state's strategic plan for sustainably managing and developing water resources for current and future generations. As required by State Water Code Section 10005(a), the California Department of Water Resources (DWR) presents in the plan the status and trends of California's water-dependent natural resources; water supplies; and agricultural, urban, and environmental water demands for a range of plausible future scenarios. The plan is updated every five years and provides a framework for collaboration among local government officials, tribes, water suppliers and resource managers, businesses, academia, and the general public. Although the plan does not mandate actions, authorize spending, or make project-specific recommendations, it does require policy-makers to take definitive steps to authorize specific actions proposed in the plan and appropriate the funding needed for their implementation.

The plan was last updated in 2023. This update promotes a vision where "all Californians benefit from water resources that are sustainable, resilient to climate change, and managed to achieve shared values and connections to our communities and the environment." To tackle this ambitious vision, the 2023 update focuses on three intersecting themes: addressing climate urgency, strengthening watershed resilience, and achieving equity in water management. (DWR, 2025)

Local Regulatory Environment

Napa County Authority & Role

Napa County has no direct authority over the entities that provide water supply to county residents. The largest suppliers are governed by the city councils elected by those city residents. Independently elected agency boards govern the other public entities, and the California Public Utilities Commission oversees privately-owned water systems to some extent. All water systems are governed by state and federal safe drinking water regulations. The larger systems, with more than 200 connections, are regulated directly by the California Department of Public Health.

The county serves as an agent of the state, ensuring compliance with the state regulations for small water systems with between five and 199 connections. The county also permits individual water systems to serve new homes in rural areas, typically on wells. Although well yield standards for new development are conservative, it is possible that individual wells and older wells serving small water systems may experience diminished yield or go dry during an extended drought. The county has no ongoing oversight of water use for individual water systems after the initial development permit is approved.

Groundwater Sustainability Plans

The Sustainable Groundwater Management Act (SGMA) establishes a statewide framework for managing groundwater resources to achieve long-term sustainability. Under SGMA, local agencies are responsible for developing and implementing Groundwater Sustainability Plans (GSPs) or approved alternatives for groundwater basins designated by the California Department of Water Resources (DWR) as high or medium priority. These plans serve as long-term roadmaps to ensure that groundwater is managed in a manner that avoids undesirable results such as chronic lowering of groundwater levels, reduced water supply reliability, land subsidence, and water quality degradation.

As part of SGMA implementation, DWR has identified five groundwater basins and subbasins within Napa County, each assigned a priority level based on factors such as population, land use, and reliance on groundwater resources:

- **Napa-Sonoma Valley – Napa Valley Subbasin** – *High Priority* - This basin coincides with the floor of the Napa Valley and encompasses nearly 46,000 acres between the City of Napa and the City of Calistoga. The GSP for this basin was approved by DWR in 2023.
- **Napa-Sonoma Valley – Napa-Sonoma Lowlands Subbasin** – *Very Low Priority*
- **Pope Valley Basin** – *Very Low Priority*
- **Berryessa Valley Basin** – *Very Low Priority*
- **Suisun-Fairfield Valley Basin** – *Low Priority*

Of these, only the Napa Valley Subbasin is classified as high priority and is therefore subject to SGMA requirements for the preparation and implementation of a GSP. High-priority basins must comply with

ongoing monitoring, reporting, and planning requirements, including annual reporting to DWR and periodic plan updates every five years. In contrast, low and very low priority basins are not currently required to develop GSPs, although they may still be subject to local groundwater management efforts.

The Napa Valley Subbasin GSP, approved by DWR in 2023, provides a comprehensive framework for managing groundwater resources across the valley floor, which extends from the City of Napa to the City of Calistoga. The plan incorporates extensive groundwater monitoring data, including groundwater levels, water quality, and recharge conditions, to establish sustainable management criteria and guide long-term water resource decisions. Local monitoring efforts, including those coordinated through Napa County watershed and groundwater programs, support ongoing assessment of groundwater conditions and inform adaptive management strategies.

Groundwater plays a critical role in Napa County's overall water supply, particularly for agricultural uses and rural residential areas that rely on private wells. As a result, effective implementation of the GSP is essential for reducing vulnerability to drought. By improving understanding of groundwater conditions, establishing sustainability thresholds, and guiding water use and recharge practices, the County and its partners can better manage water resources during prolonged dry periods.

Urban Water Management Plans (UWMP)

Jurisdictions either supplying over 3,000 acre-feet of water annually or serving more than 3,000 urban connections are required to submit an Urban Water Management Plan (UWMP) for review and approval by the California Department of Water Resources (DWR), pursuant to California Water Code, § 10610-10656 and § 10608. The plans must be updated every five years and support the suppliers' long-term resource planning to ensure that adequate water supplies are available to meet existing and future water needs. The information collected for UWMPs is useful for local, regional, and statewide water and drought planning. UWMPs also explore stormwater capacity and assist in planning and funding future stormwater needs. (DWR, 2025)

All jurisdictions participating in this MJHMP which are also municipal water suppliers have an UWMP, including the Cities of American Canyon, Calistoga, Napa, and St. Helena. As a more rural water agency, the Howell Mountain Mutual Water Company has a 2022 Drought Contingency Plan. These jurisdiction-specific plans are explored in more detail in the annexes in Volume 2.

Napa County General Plan

The Napa County General Plan Conservation Element sets forth several goals and policies relevant to drought:

- **Goal CON-10:** Conserve, enhance and manage water resources on a sustainable basis to attempt to ensure that sufficient amounts of water will be available for the uses allowed by this General Plan, for the natural environment, and for future generations.

- **Goal CON-11:** Prioritize the use of available groundwater for agricultural and rural residential uses rather than for urbanized areas and ensure that land use decisions recognize the long-term availability and value of water resources in Napa County.
- **Goal CON-12:** Proactively collect information about the status of the county's surface and groundwater resources to provide for improved forecasting of future supplies and effective management of the resources in each of the County's watersheds.
- **Policy CON-42:** The County shall work to improve and maintain the vitality and health of its watersheds [through education, restoration, and protection].
- **Policy CON-51:** Recognizing that groundwater best supports agricultural and rural uses, the County discourages urbanization requiring net increases in groundwater use and discourages incorporated jurisdictions from using groundwater except in emergencies or as part of conjunctive-use programs that do not cause or exacerbate conditions of overdraft or otherwise adversely affect the County's groundwater resources.
- **Policy CON-52:** Groundwater is a valuable resource in Napa County. The County encourages responsible use and conservation of groundwater and regulates groundwater resources by way of its groundwater ordinances.
- **Policy CON-60.5:** All aspects of landscaping from the selection of plants to soil preparation and the installation of irrigation systems should be designed to reduce water demand, retain runoff, decrease flooding, and recharge groundwater.

Regional Climate Action and Adaptation Plan

Napa County's approach to climate change and drought mitigation has evolved from the 2018 Climate Action Plan (CAP) into the Draft Regional Climate Action and Adaptation Plan (RCAAP), which establishes a comprehensive, region-wide framework to reduce greenhouse gas emissions while improving resilience to climate-related hazards. The RCAAP identifies drought and water supply impacts as a key climate risk and outlines a coordinated set of adaptation strategies, measures, and actions to enhance long-term water supply reliability and reduce vulnerability to increasingly frequent and severe drought conditions.

The RCAAP uses a structured adaptation framework consisting of overarching strategies supported by specific measures and implementation actions. One of the primary strategies directly addresses drought by focusing on water conservation, supply diversification, and system resilience, while additional cross-cutting measures support water resource sustainability through land use planning, infrastructure improvements, and ecosystem protection. Key drought-related adaptation measures identified in the RCAAP include:

- **Water Conservation and Reuse (DROUGHT-1):** Expands water conservation programs and promotes water reuse through recycled water, greywater systems, stormwater capture, and managed aquifer recharge. The plan also emphasizes public education, incentive programs (e.g., rebates, turf

replacement), and exploration of policies such as zero water footprint requirements for new development.

- **Agricultural Water Resilience (DROUGHT-2):** Supports the agricultural sector, particularly vineyards, through improved irrigation efficiency, soil health practices, and groundwater recharge strategies. Measures include promoting drip irrigation, conducting irrigation system testing, implementing cover crops, and coordinating with the Napa County Groundwater Sustainability Agency (NCGSA) to implement water conservation and groundwater management workplans.
- **Water Supply Reliability and Infrastructure Resilience (DROUGHT-3):** Calls for evaluation of water supply system vulnerabilities and development of resilience strategies, including infrastructure upgrades, adoption of resiliency standards, and implementation of drought contingency planning efforts such as the Napa Valley Drought Contingency Plan and SB 552–related planning.
- **Public Outreach and Water Conservation Culture (DROUGHT-4):** Expands education and outreach efforts to promote "water conservation as a way of life," targeting both municipal water users and self-supplied groundwater users through coordinated regional messaging and accessible information platforms.
- **Regional Water Supply Coordination (DROUGHT-5):** Encourages collaboration with local, state, and federal agencies to secure future water supplies, expand groundwater recharge, and pursue alternative water sources. This includes leveraging grant funding and coordinating with agencies such as the California Department of Water Resources and the State Water Resources Control Board.

  In addition to drought-specific measures, the RCAAP includes broader resilience strategies that support water resource sustainability. These include promoting green infrastructure and low-impact development to enhance groundwater recharge, protecting ecosystems and watershed function, and integrating climate considerations into land use planning, infrastructure design, and emergency management.

Napa County Code

Chapters 13 and 18 of the County Code set forth requirements relevant to drought, including permitting for new groundwater wells, implementation groundwater conservation practices for new wells, and landscaping and irrigation standards.

3.3.6.3 Past Events

California experienced massive changes over the course of the twentieth century as evidenced by dramatic population increases and land use conversion. (Cal. Dep't of Water Resources, 2015) The California Department of Water Resources has state hydrologic data back to the early 1900s. The hydrologic data show multi-year droughts from 1912 to 1913, 1918 to 1920, 1922 to 1924, 2007 to 2009, and 2014 to 2017.

The most recent major drought in California spanned 2014 to 2017. With California facing water shortfalls in the driest year in recorded state history, California State Governor Jerry Brown, declared a drought state of

emergency on January 17, 2014. In the State of Emergency declaration, Governor Brown directed state officials to assist farmers and communities that are economically impacted by dry conditions and to ensure the state can respond if Californians face drinking water shortages. The Governor also directed state agencies to use less water and hire more firefighters and initiated a greatly expanded water conservation public awareness campaign. On April 17, 2017, Brown issued Executive Order B-40-17, officially ending the drought state of emergency in all California counties except Fresno, Kings, Tulare, and Tuolumne.

The National Drought Monitor provides drought data and maps nationally and on a localized scale. The National Drought Monitor is the product of eleven agencies, from the NDMC, NOAA and USDA, and is available at http://droughtmonitor.unl.edu/. Figure 3-39 depicts the U.S. Drought Monitor conditions in California for both December 2017 and December 2018. In December 2017, as the declared drought ended in California, Napa County did not experience any drought conditions. One year later, however, the County already experienced abnormally dry to moderate drought conditions again.

A drought is a period of dry weather that persists long enough to cause serious problems such as crop damage and water supply shortages. In recent history, Napa County has experienced five main drought periods: 1976 to 1977, 1987 to 1992, 2007 to 2009, 2012 to 2016, and 2020 to 2023. The only drought period declared a federal disaster was 1977, triggering FEMA's Public Assistance (PA) program. It is expected that the effects of climate change will result in more severe droughts of longer duration.

Figure 3-39 shows a time series of the level of drought in Napa County between 2000 and 2026 according to the National Drought Monitor. The National Drought Monitor provides drought data and maps nationally and on a localized, watershed-scale. The National Drought Monitor is the product of 11 agencies, including the National Drought Mitigation Center (NDMC) at the University of Nebraska-Lincoln, National Oceanic and Atmospheric Administration (NOAA), and U.S. Department of Agriculture (USDA). The National Drought Monitor categorizes the level of drought from D0 through D4, with D4 being the highest "exceptional drought." Table 3-52 depicts drought classifications and impacts from the level of drought occurrence in California.

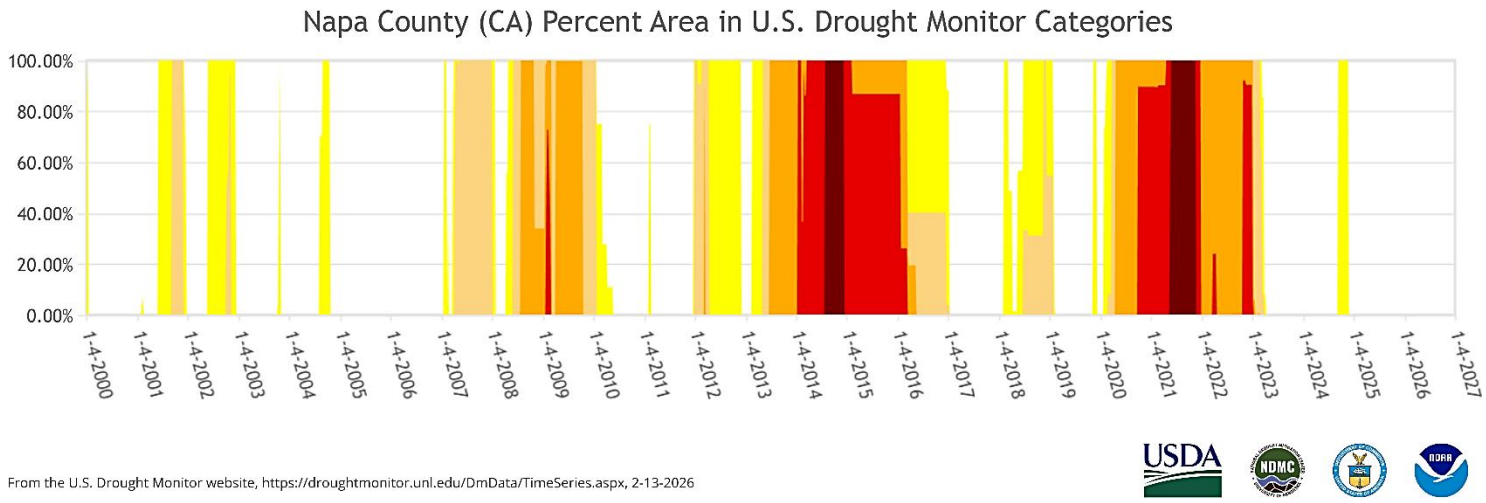


Figure 3-39: Napa County Drought History and Severity Chart

Table 3-52: Drought Classifications and Impacts for California

Category	Description	Possible Impacts
D0	Abnormally Dry	▪ Soil is dry; irrigation delivery begins early ▪ Dryland crop germination is stunted ▪ Active fire season begins ▪ Winter resort visitation is low; snowpack is minimal
D1	Moderate Drought	▪ Dryland pasture growth is stunted; producers give supplemental feed to cattle ▪ Landscaping and gardens need irrigation earlier; wildlife patterns begin to change ▪ Stock ponds and creeks are lower than usual
D2	Severe Drought	▪ Producers increase water efficiency methods and drought-resistant crops ▪ Grazing land inadequate ▪ Fire season is longer, with high burn intensity, dry fuels, and large fire spatial extent; more fire crews on staff ▪ Lake- and river-based tourism declines; boat ramps close ▪ Trees are stressed; plants increase reproductive mechanisms; wildlife diseases increase ▪ Water temperatures increase; programs to divert water to protect fish begin ▪ River flows decrease; reservoir levels are low and banks are exposed
D3	Extreme Drought	▪ Federal water not adequate to meet irrigation contracts; extracting supplemental groundwater is expensive ▪ Fire season lasts year-round; fires occur in typically wet parts of the state; burn bans are implemented ▪ Ski and rafting business is low; mountain communities suffer ▪ Low water levels impede fish migration and cause lower survival rates ▪ Wildlife encroach on developed areas; little native food and water is available for bears, which hibernate less

Category	Description	Possible Impacts
		▪ Water sanitation is a concern; reservoir levels drop significantly; surface water is nearly dry, flows are very low; water theft occurs ▪ Livestock need supplemental feed, cattle and horses are sold; little pasture remains ▪ Well and aquifer levels decrease; homeowners drill new wells
D4	Exceptional Drought	▪ Fire season is very costly; number of fires and areas burned are extensive ▪ Many recreational activities are affected ▪ Fields are left fallow; orchards are removed; vegetable yields are low; honey harvest is small; agricultural unemployment is high, food aid is needed ▪ Fish rescue and relocation begins; pine beetle infestation occurs; forest mortality is high; wetlands dry up; wildlife death is widespread; algae blooms appear ▪ Poor air quality affects health; greenhouse gas emissions increase as hydropower production decreases; West Nile outbreaks rise ▪ Water shortages are widespread; surface water is depleted; federal irrigation water deliveries are curtailed; water prices are extremely high; wells are dry, more and deeper wells are drilled; water quality is poor

Source: Adapted from U.S. Drought Monitor Drought Classifications and Impacts

3.3.6.4 Location

Drought is one of the few hazards with the potential to directly or indirectly impact the entire population of Napa County, be it from water restrictions, higher water and food prices, reduced air or water quality, restricted access to recreational areas, or economic stress from crop loss. No portion of the County is immune from drought conditions. Lack of winter snowfall in the mountains can eventually lead to agricultural impacts due to decreased stream flows. Droughts of just a few weeks during critical periods of plant development can have disastrous effects on agriculture production. Reduced reservoir storage from decreased runoff in the mountains can lead to water shortages. Droughts that occur in populated areas may not have direct effects to the residents but may increase the threat of wildfire in the wildland urban interface areas.

According to the Napa Valley Subbasin GSP, there are several wells located near the Napa Valley Subbasin margin in the northeastern Napa, southwestern Yountville, and southeastern St. Helena areas that show periods of groundwater decline during times of drought. (Napa Valley Subbasin, 2022)

3.3.6.5 Frequency & Probability of Future Occurrences

Droughts may not be predictable, but they should be expected. They occur with some regularity and varying levels of severity. The magnitude and duration of a drought, as shown in Figure 3-39, is something that can be predicted based on historical records and should be taken into account in water resources planning. According to the results of the hazard risk ranking exercises conducted by the participating jurisdictions, **the probability of drought occurring in Napa County is likely (between 10 and 100% annual probability).**

Currently there is no data on the probability of drought akin to data for predicting earthquakes or flood probability. Empirical studies conducted over the past century have shown that meteorological drought is never the result of a single cause. It is the result of many causes, often synergistic in nature; these include global weather patterns that produce persistent, upper-level high-pressure systems along the West Coast with warm, dry air resulting in less precipitation.

The expected effects of climate change will also increase the risk of drought. Numerous climate models have been run with various predictions for the Napa County area. Although it is unclear whether the average amount of rainfall will increase, it is apparent that the timing and intensity of rainfall will change, which will lead to more severe and extended droughts. More intense rainfall (as opposed to longer, less intense events) will not contribute as much to groundwater recharge or dry season stream baseflows and will ultimately have adverse impacts on water supply quality through flooding and erosion.

3.3.6.6 Severity

The severity of a drought depends on the degree of moisture deficiency, the duration, and the size and location of the affected area. The longer the duration of the drought and the larger the area impacted, the more severe the potential impacts. Droughts are not usually associated with direct impacts on people or property, but they can have significant impacts on agriculture, local economies, and natural resources, impacting people indirectly.

Drought eventually affects groundwater sources but generally not as quickly as surface water supplies; although, groundwater supplies take longer to recover. Reduced precipitation during a drought means that groundwater is not replenished at a normal rate, leading to problems such as reduced pumping capacity, wells going dry, seawater intrusion, and land subsidence. Shallow wells are more susceptible than deep wells. Reduced replenishment of groundwater also affects streams and other surface water supplies. Much of the flow in streams comes from groundwater, especially during the summer when there is less precipitation. Reduced groundwater levels mean that even less water will enter streams when steam flows are lowest.

On average, the nationwide annual impacts of drought are greater than the impacts of any other natural hazard. They are estimated to be between $6 and $8 billion annually in the United States and occur primarily in the agriculture, transportation, recreation and tourism, forestry, and energy sectors. Water-dependent industries are commonly forced to shut down all or a portion of their facilities, resulting in layoffs. Social and environmental impacts are also significant, although it is difficult to put a precise cost on these impacts. Droughts that occur in populated areas may not have direct effects to the residents but may increase the threat of wildfire.

3.3.6.7 Warning Time

Unlike most disasters, droughts normally occur slowly but last a long time. Droughts are climatic patterns that occur over extended periods of time. Only generalized warning can take place due to the numerous variables that scientists have not pieced together well enough to make accurate and precise predictions.

Scientists at this time do not know how to predict drought more than a month in advance for most locations. Predicting drought depends on the ability to forecast precipitation and temperature. Anomalies of precipitation and temperature may last from several months to several decades. How long they last depends on interactions between the atmosphere and the oceans, soil moisture and land surface processes, topography, internal dynamics, and the accumulated influence of weather systems on the global scale.

3.3.6.8 Drought Vulnerability Assessment

Drought vulnerability in Napa County varies based on water supply source, system capacity, and reliance on groundwater or surface water. Water agencies that depend more heavily on surface water are generally more susceptible to supply shortages during extended dry periods, while groundwater-dependent systems may experience delayed but longer-lasting impacts due to reduced recharge and declining water levels.

Countywide reductions in groundwater levels and streamflow highlight the ongoing need for water conservation, demand management, and supply diversification. While all populations, properties, and natural resources in Napa County are exposed to drought conditions, the severity of impacts depends on water demand and the availability of reliable water supplies.

Drought is a slow-onset hazard with widespread and long-term impacts across multiple sectors. In Napa County, the agricultural sector is particularly vulnerable due to its reliance on consistent water supplies. Reduced water availability can affect crop production, increase operational costs, and contribute to broader economic impacts, including reduced employment in agriculture and related industries.

3.3.6.8.1 Population

The entire population of Napa County is directly or indirectly affected by drought conditions. Direct impacts include reduced water availability and potential limitations on water use, while indirect impacts include increased water costs, reduced agricultural production, and economic effects on water-dependent industries.

Rural residents who rely on private wells or small water systems are particularly vulnerable to drought. These systems often lack redundancy and are more susceptible to declining groundwater levels during prolonged dry periods. Shallow wells, in particular, may experience reduced yield or go dry, especially as groundwater demand increases.

Drought conditions can also contribute to public health concerns, including reduced air quality from dust and wildfire smoke, which may exacerbate respiratory conditions such as asthma. Additionally, prolonged

drought increases wildfire risk due to dry vegetation, further compounding risks to communities, infrastructure, and natural resources.

Disproportionately Impacted Populations

Certain populations in Napa County may be disproportionately impacted by drought conditions due to economic, physical, and social factors that limit their ability to prepare for, respond to, and recover from water shortages. As described in Section 1.5.3, low-income households may be more sensitive to increases in water costs associated with drought, including higher utility rates, well maintenance expenses, and costs associated with water conservation measures or alternative water supplies.

Residents in rural areas, particularly those dependent on private wells, face increased vulnerability due to limited water supply reliability and the potential for wells to go dry during extended drought conditions. These households may also have limited access to financial resources needed to deepen wells, install storage systems, or secure alternative water sources.

Individuals with access and functional needs, including older adults, persons with disabilities, and medically dependent individuals, may experience additional challenges during drought. Reliable access to water is essential for health, sanitation, and medical needs, and disruptions or limitations in water supply may have more severe consequences for these populations.

Additionally, renters may have limited control over water infrastructure or conservation upgrades, such as irrigation systems or plumbing improvements, and may be indirectly impacted by increased housing costs or reduced property maintenance during drought conditions.

Overall, while drought affects the entire population, these factors indicate that impacts may be more severe for populations with reduced financial capacity, limited mobility, or reliance on vulnerable water supply systems.

3.3.6.8.2 Property

Drought does not typically cause direct structural damage to buildings; however, it can result in significant indirect impacts. These include increased wildfire risk, loss of landscaping, and economic impacts to water-dependent properties and businesses.

Napa County's economy is highly dependent on agriculture and tourism, both of which are sensitive to water availability. Water shortages or restrictions during peak seasons may affect agricultural production, hospitality operations, and other tourism-related businesses, potentially resulting in revenue losses and reduced economic activity.

Property owners relying on groundwater—particularly those with shallow wells—may experience increased costs or reduced water availability during drought conditions. Additionally, shifts from surface water to

groundwater use during drought periods can place further stress on aquifers, contributing to long-term supply challenges.

3.3.6.8.3 Critical Facilities & Infrastructure

Critical facilities and infrastructure in Napa County are expected to remain operational during drought conditions; however, the systems that support essential services are vulnerable to reduced water availability and associated secondary impacts. Key systems at risk include water supply, wastewater, energy, communications, and emergency services.

Drought can reduce the availability and quality of water supplies needed to support these systems. Lower reservoir levels and reduced streamflow may concentrate pollutants, increase water temperatures, and promote harmful algal blooms, all of which can degrade water quality and complicate treatment processes. In some cases, reduced freshwater flows may also contribute to saltwater intrusion, further affecting water supply reliability.

Water and wastewater infrastructure may also be indirectly impacted by drought-related conditions. Reduced groundwater levels can increase stress on pipelines and wells, while extreme drying may contribute to localized ground instability, potentially affecting buried infrastructure. Additionally, wildfire—closely associated with drought—poses a significant secondary threat to critical facilities and lifelines.

Drought also highlights the interdependency of infrastructure systems. Water is essential for energy production, including cooling and operational processes at power facilities, while energy is required to extract, treat, and distribute water. Communications infrastructure, including data centers, also relies on water for cooling. Disruptions to water supply can therefore have cascading effects across multiple sectors.

Emergency services may face additional constraints during severe drought. Reduced water availability and pressure can limit firefighting capabilities, particularly in areas dependent on hydrant systems or stored water supplies. These limitations, combined with increased wildfire risk, can significantly strain emergency response capacity.

Impacts on Agriculture

The agricultural sector demonstrates the potential site-specific impacts of drought. Droughts of just a few weeks during critical periods of plant development can have disastrous effects on agriculture production. A drought can result in farmers not being able to plant crops or the failure of planted crops, leading to loss of work for agricultural workers and those in food industries.

Agricultural drought impacts are normally felt earliest by those relying on unmanaged water supplies: entities carrying out dryland grazing and non-irrigated crop production, usually grain crops. Impacts to irrigated agriculture depend on the source and nature of the irrigation water supply, whether it be local groundwater, local surface water, or imported surface water, and any water rights or contractual provisions that may be associated with the source. The extent to which producers may mitigate water shortage impacts

depends on multiple factors but is heavily influenced by economic considerations. Factors involved in making decisions about mitigating irrigation water shortages include availability and costs of pumping groundwater, price of alternative surface water sources, capital investments associated with maintaining permanent plantings, and status of international crop markets. (California Drought Contingency Plan, 2021)

The 2024 Napa County Crop Report indicates that agricultural crop value totaled over $1 billion to the county economy in 2023. Wine grapes account for the overwhelming majority of Napa County agriculture. It should be emphasized that 2023 was above-average water year for Napa County and, thus, a single-year drought or a multi-year drought has the potential to deleteriously affect the county's agricultural economy. In contrast, during the 2021 growing season which was accompanied by multiple heat events, top vineyards in the Napa Valley noted 10 to 30% drops in yields, stressed vines and cover crops, and reliance on reservoir water, with some growers' reservoirs running dry.

Impacts on Groundwater

Groundwater conditions in Napa County are closely tied to both climatic variability and water use patterns, and drought conditions can significantly increase stress on the County's aquifer systems. Reduced precipitation and runoff during drought periods limit natural recharge, while increased reliance on groundwater—particularly for agricultural and rural domestic use—can accelerate declines in groundwater levels.

Recent monitoring and analysis conducted as part of the Napa Valley Subbasin Groundwater Sustainability Plan (GSP) indicate that groundwater extraction has exceeded sustainable levels during drought conditions, resulting in measurable impacts to groundwater storage and interconnected surface water systems. During Water Years 2021 and 2022, minimum thresholds were exceeded for key sustainability indicators, including declining groundwater storage and depletion of interconnected surface water, demonstrating the sensitivity of the basin to prolonged dry conditions.

Groundwater use in Napa County is dominated by the agricultural sector, which accounts for the majority of pumping, followed by domestic, municipal, and industrial uses. Recent data indicate that total groundwater use has remained substantial across all sectors, with agriculture representing the largest share of demand. During drought conditions, reduced surface water availability often leads to increased groundwater pumping, further intensifying stress on the aquifer system. Declining groundwater levels can result in several adverse impacts, including:

- Reduced well productivity, particularly for shallow or low-capacity wells
- Increased pumping costs due to greater depths to groundwater
- Reduced baseflow to streams and creeks, affecting aquatic habitat and surface water availability
- Potential long-term reductions in groundwater storage

In Napa County, groundwater and surface water systems are highly interconnected. Increased groundwater pumping during drought can reduce flows in streams and rivers, particularly during late summer and fall when surface water levels are already low. This interaction is a key concern under SGMA, as reductions in interconnected surface water are considered an undesirable result that must be avoided through sustainable groundwater management.

To address these challenges, the Napa County Groundwater Sustainability Agency (NCGSA) has established a goal of reducing groundwater pumping in the Napa Valley Subbasin by approximately 10 percent from historical baseline levels as part of GSP implementation. Achieving this reduction is intended to improve groundwater storage conditions and reduce impacts to interconnected surface water systems.

Ongoing monitoring efforts—including expanded groundwater level networks, water use tracking, and hydrologic modeling—are being used to evaluate groundwater conditions and inform adaptive management strategies. These efforts support a long-term approach to balancing groundwater supply and demand, particularly under changing climate conditions.

Overall, drought conditions increase reliance on groundwater resources while simultaneously reducing recharge, creating a compounding effect that can lead to long-term declines in groundwater availability if not properly managed. Continued implementation of groundwater sustainability measures, water conservation practices, and demand management strategies will be critical to maintaining reliable groundwater supplies in Napa County.

3.3.6.9 Development Trends

Development patterns in Napa County have a direct influence on groundwater demand, recharge, and long-term basin sustainability. Growth is generally concentrated within incorporated cities and established service areas, while rural and agricultural lands—many of which rely heavily on groundwater—continue to play a significant role in overall water demand.

Groundwater use in Napa County is distributed across multiple sectors, including agriculture, domestic users, municipal systems, and commercial/industrial uses such as wineries. Recent data indicate that agricultural uses account for the majority of groundwater demand, with additional contributions from self-supplied rural residences and small water systems. As development continues, particularly in rural and vineyard areas, groundwater demand may increase if not offset by conservation measures or alternative water supplies.

The County's regulatory framework, including well permitting requirements and water availability analyses, requires that new development demonstrate adequate water supply and consider potential impacts to groundwater resources. Under SGMA, the Napa County Groundwater Sustainability Agency (NCGSA) is responsible for managing groundwater in the Napa Valley Subbasin to achieve long-term sustainability. This includes implementing projects and management actions—such as groundwater pumping reductions—to balance supply and demand and avoid undesirable results.

Development can also affect groundwater recharge. The expansion of impervious surfaces associated with residential, commercial, and infrastructure development may reduce natural infiltration, limiting the ability of groundwater basins to replenish during wet periods. In contrast, agricultural lands and open space areas can support recharge, depending on land management practices and soil conditions.

Recent planning efforts emphasize water conservation, efficiency, and demand management as key strategies for accommodating growth without increasing groundwater stress. The Groundwater Pumping Reduction Workplan identifies a range of voluntary and potential mandatory measures—including improved irrigation efficiency, water reuse, metering, and benchmarking—to reduce overall groundwater pumping across sectors. These measures are intended to support continued economic activity while maintaining groundwater sustainability.

Despite these efforts, drought conditions and climate change introduce additional uncertainty. Increased temperatures, changing precipitation patterns, and more frequent dry periods may reduce recharge and increase reliance on groundwater, particularly during peak demand periods. As a result, even modest increases in development could contribute to cumulative impacts on groundwater resources if not carefully managed.

Overall, Napa County's development trends reflect a balance between growth and resource protection. While existing policies and SGMA implementation provide a strong framework for managing groundwater demand, continued coordination between land use planning, water resource management, and climate adaptation efforts will be essential to ensure that future development does not exacerbate groundwater depletion or compromise long-term water supply reliability.

Development Impacts

As population and economic activity increase in Napa County, overall water demand is expected to rise, placing additional pressure on water supplies during drought conditions. However, Urban Water Management Plans indicate that sufficient supplies are projected to meet future demand under both normal and dry-year scenarios. Through existing plans, policies, and regulatory requirements, new development must demonstrate adequate water availability and contribute to necessary infrastructure improvements. These improvements, including water supply, storage, and distribution systems, are typically funded by developers through impact fees or required construction, helping to offset the potential effects of growth on water resources while maintaining long-term supply reliability.

3.3.6.10 Climate Change Impacts

Drought is a recurring hazard in Napa County and is expected to intensify under changing climate conditions. Rising temperatures, increased evapotranspiration, and more variable precipitation patterns are projected to result in more frequent and prolonged droughts, reducing surface water availability and limiting groundwater recharge. These conditions place additional stress on the Napa Valley Subbasin and other local groundwater resources, increasing reliance on groundwater pumping and reducing overall water supply

reliability. Climate-driven changes also have the potential to impact agricultural productivity, ecosystem health, and long-term water availability across the xounty.

Direct Impacts

Drought reduces water available for agricultural production, irrigation, and domestic use, with cascading effects on Napa County's economy and communities. Reduced streamflow and reservoir storage can degrade water quality by concentrating pollutants and increasing temperatures, leading to higher treatment costs and operational challenges for water providers. Groundwater-dependent users, including rural residences and small water systems, may experience declining well yields or supply interruptions during prolonged dry periods.

Secondary Hazards

Drought conditions significantly increase **wildfire risk** by drying vegetation, extending the fire season, and increasing fuel availability across Napa County's wildland-urban interface areas. Wildfires can further exacerbate drought impacts by damaging watersheds, reducing vegetation cover, and increasing erosion, which may impair water quality and reduce recharge capacity. In addition, reduced groundwater recharge and increased pumping during drought conditions can contribute to long-term declines in groundwater levels and reduced baseflow to streams, affecting aquatic ecosystems and surface water availability.

Public Health and Social Impacts

Drought impacts are not experienced equally across the population. As described in Section 1.5.3, low-income households, renters, older adults, and individuals with access and functional needs may be disproportionately affected. Increased water costs, reduced supply reliability, and the need for conservation measures can place a greater burden on households with limited financial resources.

Residents in rural areas who rely on private wells are particularly vulnerable, as they may experience reduced water availability or well failure during extended drought conditions and may lack the resources to deepen wells or secure alternative supplies. Language barriers and limited access to information may also reduce the effectiveness of conservation outreach for some populations.

Drought-related conditions can also contribute to public health concerns, including reduced air quality from wildfire smoke and dust, which may exacerbate respiratory illnesses. Additionally, reduced water availability can impact sanitation, cooling, and overall health, particularly for medically vulnerable populations.

3.3.6.11 Drought Hazard Problem Statements

As part of the mitigation action identification process, the Napa County Planning Team developed areas of concern (i.e., problem statements) that summarize the county's most pressing drought-related vulnerabilities and challenges. The problem statements were developed based on the updated risk

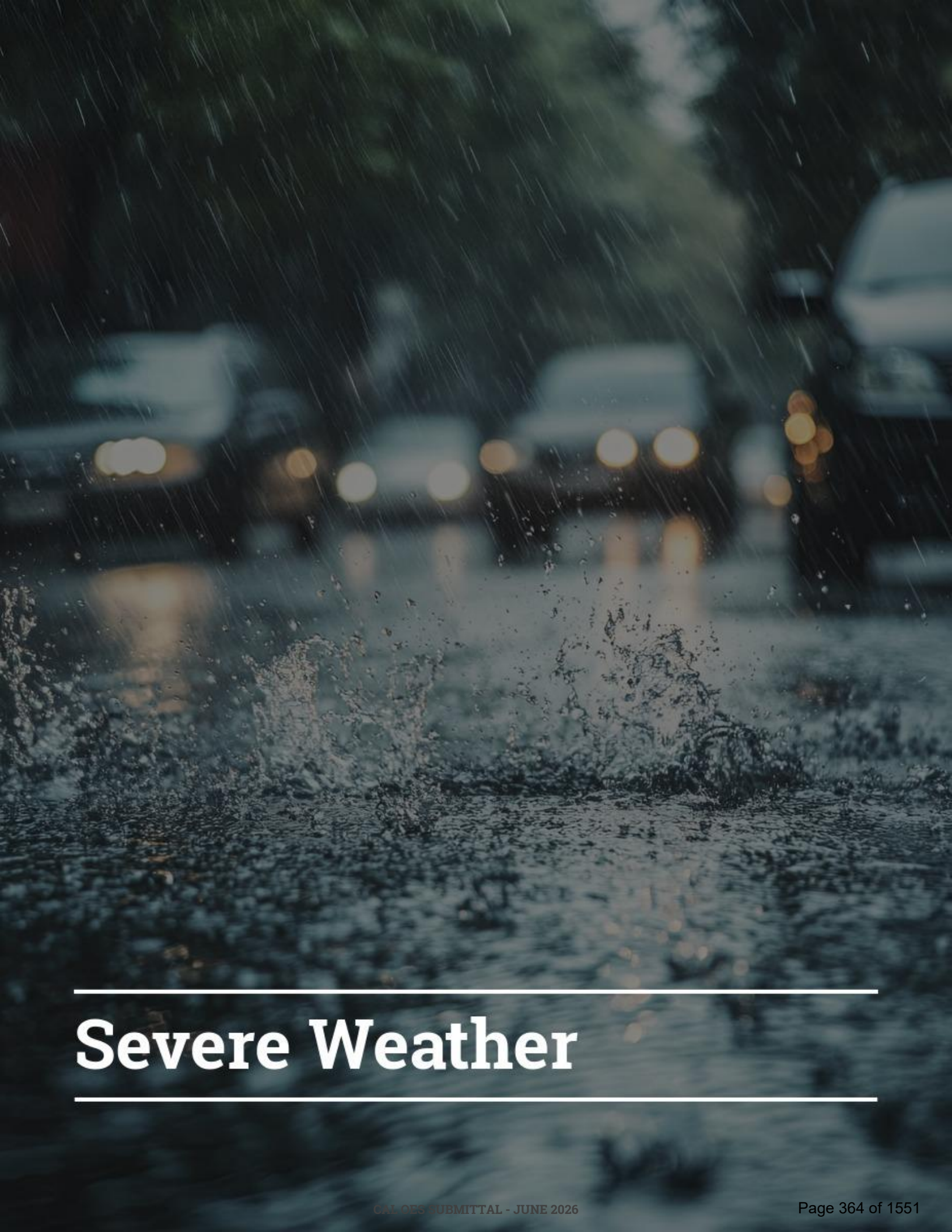
assessment and vulnerability analysis contained herein, as well as the team's local knowledge and experience and community input. The problem statements address a broad spectrum of concerns, from direct impacts on residents and vulnerable populations to threats to critical infrastructure and long-term recovery.

These problem statements are not intended to be all-encompassing or to describe each and every issue associated with drought hazards. Instead, they highlight the most urgent concerns that can be addressed within the scope of this MJHMP. Each statement will be linked to at least one mitigation action, ensuring that identified needs are met with specific, measurable, and equitable solutions. Table 3-53 presents the drought problem statements for Napa County, along with their associated areas of concern and reference numbers for cross-linking to the mitigation actions in Table 4-4.

Table 3-53: Napa County Drought Hazard Problem Statements

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-DR-NCo-41	Drought	Impact	**Napa County**	Increasing average temperatures and changes in precipitation volume and timing from climate change is decreasing the reliability of both surface and groundwater supplies in the County.	ma-DR-NCo-23, ma-DR-NCo-24, ma-DR-NCo-25, ma-DR-NCo-26, ma-CC-NCo-18
ps-DR-NCo-388	Drought	Impact	**Napa County**	Prolonged drought stresses agricultural resources and natural ecosystems, increasing risks of crop failure and wildfire.	ma-AG-NCo-1, ma-CC-NCo-18
ps-DR-NCo-389	Drought	Victim	**Napa County**	Drought disproportionately impacts lower-income households with utility rate increases and those reliant on the local agriculture-based economy, including workers in the farming, food, service, and tourism industries.	ma-AH-NCo-6, ma-AG-NCo-1, ma-CC-NCo-18, ma-DR-NCo-24

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Severe Weather

3.3.7 Severe Weather Hazard Profile



Severe weather refers to any hazardous atmospheric event with the potential to cause physical damage, social disruption, or loss of life. This includes thunderstorms, downbursts, heavy rain, snowstorms, ice storms, strong winds, and other extreme weather conditions. Winter weather, such as freezing temperatures, snow accumulation, and black ice, is a key component of severe weather in Napa County, particularly in higher elevation areas.

Severe weather events can be categorized into two types. Those that affect broad geographic regions, such as Pacific Northwest windstorms or large-scale winter storms, are classified as general severe weather. Events with a more confined area of impact, such as isolated thunderstorms or localized snow squalls, are considered localized severe weather.

3.3.7.1 Secondary & Compounding Hazards

The most significant secondary hazards associated with severe weather in the planning area include flooding, downed trees, landslides, power outages, and, in some cases, increased wildfire risk following wind-driven damage or infrastructure failure. Heavy rain can overwhelm both natural and man-made drainage systems, causing overflow and property destruction. Landslides occur when the soil on slopes becomes oversaturated and fails. Landslides are further outlined as slope failure in Section 3.3.5, while flooding is analyzed in Section 3.3.2.

Climate Change

As the world has warmed, that warming has triggered many other changes to the Earth's climate. Changes in extreme weather and climate events, such as heat waves and droughts, are the primary way that most people experience climate change. Human-induced climate change has already increased the number and strength of these extreme events. Over the last 50 years, much of the U.S. has seen increases in prolonged periods of excessively high temperatures, heavy downpours, and in some regions, severe floods and droughts. (National Climate Assessment, 2014)

Extended frost threat is another result of climate change. In February 2018, grape growers prepared for extended frost threat, while coping with a lack of rainfall during what are typically the wettest months of the year. As climate change continues, bud break, or the appearance of shoots that will eventually yield grapes, will begin sooner, leaving the delicate new growth exposed to the hazards of frost and rain for a longer stretch of the growing season. (Lutz, 2018)

3.3.7.2 Subhazards

For Napa County, there are specific subhazards of severe weather that are more relevant to the planning area than others. This includes high wind, heavy rain and winter weather, which are profiled as part of this section, but it also includes mention of thunderstorms and hail.

High Wind

Damaging winds are classified as those exceeding 60 mph. Damage from such winds accounts for half of all severe weather reports in the lower 48 states and is more common than damage from tornadoes. Wind speeds can exceed 100 miles per hour (mph) and can produce a damage path extending for hundreds of miles. There are seven types of damaging winds:

- **Straight-Line Wind:** Any thunderstorm wind that is not associated with rotation; this term is used primarily to differentiate from tornado winds. Most thunderstorms produce some straight-line winds as a result of outflow generated by the thunderstorm downdraft.
- **Downdraft:** A small-scale column of air that rapidly sinks toward the ground.
- **Downburst:** A strong downdraft with horizontal dimensions larger than 2.5 miles resulting in an outward burst or damaging winds on or near the ground. Downburst winds may begin as a microburst and spread out over a wider area, sometimes producing damage similar to a strong tornado. Although usually associated with thunderstorms, downbursts can occur with showers too weak to produce thunder.
- **Microburst:** A small concentrated downburst that produces an outward burst of damaging winds at the surface. Microbursts are generally less than 2.5 miles across and short-lived, lasting only 5 to 10 minutes, with maximum wind speeds up to 168 mph. There are both wet and dry microbursts:. A wet microburst is accompanied by heavy precipitation. Dry microbursts, common in places like the high plains and the intermountain west, occur with little or no precipitation reaching the ground.
- **Gust Front:** A gust front is the leading edge of rain-cooled air that clashes with warmer thunderstorm inflow. Gust fronts are characterized by a wind shift, temperature drop, and gusty winds out ahead of a thunderstorm. Sometimes the winds push up air above them, forming a shelf cloud or detached roll cloud.
- **Derecho:** A derecho is a widespread thunderstorm wind caused when new thunderstorms form along the leading edge of the boundary formed by horizontal spreading of thunderstorm-cooled air. The word “derecho” is of Spanish origin and means “straight ahead.” Thunderstorms feed on the boundary and continue to reproduce. Derechos typically occur in summer when complexes of thunderstorms form over plains, producing heavy rain and severe wind. The damaging winds can last a long time and cover a large area.
- **Bow Echo:** A bow echo is a linear wind front bent outward in a bow shape. Damaging straight-line winds often occur near the center of a bow echo. Bow echoes can be 200 miles long, last for several hours, and produce extensive wind damage at the ground.

Heavy Rain

As storms arrive onto land from the Pacific and rise over the mountains and ridges that border the eastern boundaries of the county, the air associated with those storms cools and that cooling results in large amounts of precipitation, also known as orographic lift. The topography of Napa County provides fairly steep and well-defined watershed areas to funnel the falling rain into runoff tributaries and potentially trigger flood hazards.

Heavy rain can overwhelm both natural and man-made drainage systems, causing overflow and property destruction, and landslides can occur when the soil on slopes becomes oversaturated and fails. In Napa County, heavy rain events are common from November to April. These heavy rainstorms, often associated with an “atmospheric river” event, can deliver over one inch of rain per hour for extended time frames.

Atmospheric rivers are relatively long, narrow regions in the atmosphere (i.e., rivers in the sky) that transport water vapor, mostly from the tropics. While these rivers can vary greatly in size and strength, the average atmospheric river carries an amount of water vapor roughly equivalent to the average flow of the Mississippi River, but exceptionally strong rivers can transport up to 15 times that amount. When the atmospheric rivers make landfall, it typically releases this water vapor in the form of rain or snow. These events can disrupt travel, induce slope failures, and cause damage to life and property. A well-known referential terms for this phenomenon is the "Pineapple Express," which is a strong atmospheric river that brings moisture from the tropics near Hawaii to the West Coast. A singular or series of atmospheric rivers can cause significant damage and flooding. In 2023, more than two dozen atmospheric rivers caused two federally declared disasters. In 2024 it was one major atmospheric river that caused a federally declared disaster

Flash floods are the leading cause of heavy rain-related fatalities. Further, the presence of burn scars from previous wildfires, such as those left by the 2020 LNU Lightening Complex Fires, increases runoff and flood risks in vulnerable areas. Heavy rain and flash flooding can affect vulnerable populations such as residents living near burn scars or in low-lying areas and tourists and hikers unaware of flash flood risks in remote, mountainous areas. Impacts on property and critical infrastructure include temporary road closures as well as damage to roads, bridges, and structures. Water treatment plants and electrical substations located near waterways are particularly vulnerable.

For more information on the secondary impacts caused by heavy rain, such as flooding, refer to the Flood and Slope Failure Hazard Profiles in Sections 3.3.2 and 3.3.5, respectively.

Winter Weather

Winter weather in Napa County is primarily characterized by intense precipitation events and periodic freeze conditions occurring between November and April. The most significant winter weather hazard is associated with atmospheric river (AR) storm systems, which can deliver prolonged, high-intensity rainfall. These events are capable of producing rainfall rates exceeding one inch per hour over extended durations,

resulting in rapid soil saturation, increased runoff, and elevated risk of flooding, slope failure, and infrastructure impacts.

While snowfall is extremely rare in Napa County, freeze events, including frost and occasional hard freezes, can occur during late fall, winter, and early spring. These events are particularly important due to their potential impacts on agriculture, especially vineyards and other sensitive crops.

For additional information on flooding associated with heavy precipitation events, refer to the Flood Hazard Profile (Section 3.3.2).

Other Subhazards Not Profiled

Severe Thunderstorms

Severe thunderstorms can cause both high wind and heavy rain, as well as hail and tornadoes; however, they are not highlighted as a severe weather subhazard in this profile since the primary impact of thunderstorms in Napa County is the potential spread of wildfire, which is described in more detail in Section 3.3.1.

Hail

Hail is a form of precipitation consisting of solid ice that is formed inside the updraft of a thunderstorm. Small ice particles and supercooled water droplets that are lifted into a thunderstorm by its updraft can combine before falling into the storm's downdraft. Then, if the updraft is strong enough, these hail stone "seeds" can be recycled back up above the freezing level in the storm to accumulate additional ice and water. It is the repeating of this process numerous times that produces larger and larger hail stones. Once a stone is too big for the updraft to hold it up in the storm, it will fall to the ground. To be categorized as severe, hail must reach a size of one inch in diameter or larger.

Hail is a dangerous product of thunderstorms, with stones as large as grapefruit in supercell thunderstorms. Large hail can damage aircraft, homes and cars, and can be deadly to livestock and people. Hail is categorized between a quarter-inch diameter or "pea" size, up to grapefruit at four-and-a-half inches. Hail is rare in Napa County but has occurred in the past, causing significant crop damage.

3.3.7.3 Policies, Plans & Regulatory Environment

There are very few formal regulations that pertain directly to severe weather events. The California Building Standards Code, adopted by the county and other participating jurisdictions, is generally adequate to properly address development impacts from severe weather events.

California Building Standards Code

The California Building Code (CBC), adopted by Napa County and the incorporated municipalities, is another name for the body of regulations known as the California Code of Regulations, Title 24, Part 2, which is a portion of the California Building Standards Code. The CBC incorporates by reference the International Building Code (IBC) requirements with necessary California amendments. In particular for severe weather, the CBC sets various structural loading standards, such as for high wind and snow.

Local Regulatory Environment

Napa County General Plan

The Napa County General Plan Safety Element (2023 Update) establishes goals and policies that support preparedness for severe weather events, including heavy rainfall, high wind, and extreme storm conditions that can result in flooding, power outages, and transportation disruptions. The following goal and policies are particularly relevant to severe weather hazards:

- Goal SAF-2: The County will be prepared in the event of a disaster to protect residents and businesses from impacts and further harm, while initiating post-disaster recovery and reconstruction as soon as feasible.
- Policy SAF-2.5: Protect vulnerable populations during hazard events. The County shall coordinate with municipalities, emergency response providers, and community organizations to identify individuals who may require assistance during severe weather events—including storms that result in flooding, extended power outages, or access limitations—and to mobilize resources such as transportation, shelter, and emergency services.
- Policy SAF-2.2 and SAF-2.6: Enhance emergency communication systems. The County supports the use of multiple communication platforms, including Alert Napa County and other emergency notification systems, to disseminate timely warnings and emergency information during severe storm events, ensuring broad reach to residents, businesses, and visitors.
- Policy SAF-2.3 and SAF-2.19: Maintain continuity of critical services. The County will support the structural and operational integrity of essential public services during severe weather events, including provision of backup or redundant power systems at critical facilities such as emergency shelters, pump stations, and communications infrastructure, which are particularly vulnerable during high wind and storm-related outages.
- Policy SAF-2.9: Disseminate emergency planning information. The County will coordinate with the agricultural sector and other organizations to provide emergency preparedness information for hazards such as severe weather and flooding, which can impact agricultural operations, workers, and associated economic activities.
- Policy SAF-9.1: Provide resources to vulnerable populations. The County will conduct outreach and support the establishment of accessible shelters and resources for populations most affected by

severe weather impacts, including those at risk from power outages, flooding, and mobility constraints.

3.3.7.4 Past Events

Severe weather events in Napa County are most commonly associated with high and strong wind events, which represent the majority of recorded incidents since 2015. According to data from the National Oceanic and Atmospheric Administration (NOAA), Napa County has experienced more than 90 severe weather events over this period, with high/strong winds accounting for the overwhelming majority of occurrences (See Table 3-54). These events have resulted in a limited number of injuries (six reported) and relatively minor documented property damage, totaling approximately $37,000.

While most wind events have not resulted in significant reported damages, they occur frequently and can cause localized impacts such as downed trees, power outages, and minor structural damage. Wind events are often associated with winter storm systems and may occur in conjunction with other hazards such as heavy rainfall or wildfire conditions.

Table 3-54. Severe Weather Events in Napa County, 2015-present

Date	Type	Deaths	Injuries	Property Damage	Crop Damage
2/13/2025	Strong Wind	0	0	None reported	None reported
2/04/2025	High Wind	0	0	None reported	None reported
12/29/2024	High Wind	0	0	None reported	None reported
12/14/2024	Strong Wind	0	1	None reported	None reported
11/21/2024	High/Strong Wind	0	1	$1,000	None reported
2/19/2024	Thunderstorm Wind	0	0	$1,000	None reported
2/04/2024	High/Strong Wind	0	0	None reported	None reported
7/01/2023	Excessive Heat	0	0	None reported	$1,000
3/21/2023	High Wind	0	0	None reported	None reported
3/14/2023	High Wind	0	0	None reported	None reported
3/09/2023	High Wind	0	0	None reported	None reported
2/21/2023	Strong Wind	0	0	None reported	None reported
1/21/2023	Frost/Freeze	0	0	None reported	None reported
1/04/2023	Strong Wind	0	0	None reported	None reported
12/27/2022	High Wind	0	0	None reported	None reported
4/11/2022	Strong Wind	0	0	None reported	None reported
3/04/2022	Strong Wind	0	0	None reported	None reported
1/22/2022	High Wind	0	0	None reported	None reported
7/10/2021	Excessive Heat	0	0	None reported	None reported
6/07/2021	Strong Wind	0	0	None reported	None reported
5/19/2021	Strong Wind	0	0	None reported	None reported
3/30/2021	Strong Wind	0	0	None reported	None reported
2/23/2021	Frost/Freeze/Strong Wind	0	0	None reported	None reported

Date	Type	Deaths	Injuries	Property Damage	Crop Damage
1/26/2021	Frost/Freeze/Strong Wind	0	0	None reported	None reported
1/24/2021	Strong Wind	0	0	None reported	None reported
1/18/2021	High/Strong Wind	0	0	None reported	None reported
12/07/2020	Strong Wind	0	0	None reported	None reported
11/10/2020	Frost/Freeze	0	0	None reported	None reported
11/08/2020	Strong Wind	0	0	None reported	None reported
11/06/2020	Strong Wind	0	0	None reported	None reported
10/25/2020	High Wind	0	0	None reported	None reported
10/14/2020	Strong Wind	0	0	None reported	None reported
9/08/2020	Strong Wind	0	0	None reported	None reported
9/06/2020	Excessive Heat	0	0	None reported	None reported
8/16/2020	Thunderstorm Wind	0	0	None reported	None reported
6/05/2020	Strong Wind	0	0	None reported	None reported
4/05/2020	Strong Wind	0	0	None reported	None reported
3/01/2020	Strong Wind	0	0	None reported	None reported
2/09/2020	Strong Wind	0	0	None reported	None reported
2/02/2020	Strong Wind	0	0	None reported	None reported
12/06/2019	Strong Wind	0	0	None reported	None reported
11/30/2019	Strong Wind	0	0	None reported	None reported
11/28/2019	Frost/Freeze	0	0	None reported	None reported
11/26/2019	High/Strong Wind	0	0	None reported	None reported
10/31/2019	High Wind	0	0	None reported	None reported
10/29/2019	High Wind	0	0	None reported	None reported
10/27/2019	High/Strong Wind	0	0	$3,000	None reported
10/23/2019	High/Strong Wind	0	0	None reported	None reported
10/09/2019	Strong Wind	0	0	None reported	None reported
5/16/2019	Strong Wind	0	0	$1,000	None reported
4/16/2019	Strong Wind	0	4	None reported	None reported
3/05/2019	Strong Wind	0	0	None reported	None reported
2/25/2019	High/Strong Wind	0	0	None reported	None reported
2/13/2019	Strong Wind	0	0	None reported	None reported
2/02/2019	Strong Wind	0	0	None reported	None reported
1/16/2019	Strong Wind	0	0	None reported	None reported
1/08/2019	Strong Wind	0	0	None reported	None reported
1/05/2019	Strong Wind	0	0	None reported	None reported
12/31/2018	Strong Wind	0	0	None reported	None reported
12/28/2018	Strong Wind	0	0	None reported	None reported
11/29/2018	High/Strong Wind	0	0	$10,000	None reported
11/22/2018	Strong Wind	0	0	None reported	None reported
10/14/2018	Strong Wind	0	0	None reported	None reported
10/06/2018	High Wind	0	0	None reported	None reported
3/01/2018	Strong Wind	0	0	None reported	None reported

Date	Type	Deaths	Injuries	Property Damage	Crop Damage
12/16/2017	Strong Wind	0	0	None reported	None reported
11/27/2017	Strong Wind	0	0	None reported	None reported
10/08/2017	Strong/High Wind	0	0	None reported	None reported
6/11/2017	Hail	0	0	None reported	None reported
4/08/2017	Extreme Cold/Wind Chill	0	0	None reported	None reported
4/06/2017	Strong Wind	0	0	None reported	None reported
2/20/2017	High Wind	0	0	None reported	None reported
2/17/2017	High Wind	0	0	None reported	None reported
2/07/2017	High Wind	0	0	None reported	None reported
10/27/2016	High Wind	0	0	None reported	None reported
12/22/2015	High Wind	0	0	None reported	None reported
2/09/2015	Heavy Rain	0	0	None reported	None reported
2/06/2015	High/Strong Wind	0	0	$23,500	None reported

Source: NOAA Storm Events Database for Napa County, including the North Bay Interior and North Bay Mountain Zones: https://www.ncdc.noaa.gov/stormevents/

3.3.7.5 Location

Severe weather events have the potential to happen anywhere in the planning area and have historically occurred in all parts of the county; although, the types of events and their impacts are not evenly distributed. Local topography and microclimates can cause the same storm system to produce different hazardous conditions as it moves across an area and encounters more or less moisture, various temperatures, and orographic lift, which can all influence its behavior. High wind events are most damaging to areas that are heavily wooded, while heavy rain impacts are typically seen over steep terrain and in low-lying urban areas. Additionally, the trajectory of storm systems plays a significant factor.

Communities in low-lying areas next to streams or lakes are more susceptible to flooding. Wind events are most damaging to areas that are heavily wooded. Figure 3-41 shows the distribution of average annual rainfall in Napa County, Figure 3-42 shows the 30-year normal minimum temperature for January, and Figure 3-40 depicts average annual wind speed by power class (refer to Table 3-55).

3.3.7.6 Frequency & Probability of Future Events

Severe weather events in Napa County occur regularly and are most commonly associated with high and strong winds, heavy rainfall, and occasional hail events. Based on historical data, these events occur multiple times per year, with high/strong wind events representing the most frequent hazard type.

Since 2015, the majority of recorded severe weather incidents in Napa County have been wind-related, as summarized in Table 3-54. While heavy rain events occur less frequently as standalone severe weather entries, they contribute to cumulative impacts such as localized flooding and property damage. Documented severe weather-related damages over this period have been relatively limited, though impacts may be underreported or captured under other hazard categories such as flooding.

The frequency of severe weather events is expected to remain high, with multiple events occurring annually. Climate change is anticipated to increase the intensity and variability of weather patterns, including more extreme wind events and more intense precipitation associated with atmospheric river storms. These changes may increase the likelihood of higher-impact events, even if overall event frequency remains relatively consistent.

Based on historical occurrence and expected future conditions, the probability of severe weather events in Napa County is considered highly likely, with an annual probability approaching 100 percent.

3.3.7.7 Severity

The most common problems associated with severe storms are immobility and loss of utilities. Fatalities are uncommon, but can occur. Roads may become impassable due to flooding, downed trees, ice or snow, or a landslide. Crops can be damaged by below-freezing temperatures. Power lines may be downed due to high winds or ice accumulation, and services such as water or phone may not be able to operate without power. Lightning can cause severe damage and injury. Northern California experiences lightning caused wildfires every summer.

Windstorms can be a problem in the planning area and could cause damage to utilities. The predicted wind speed given in wind warnings issued by the National Weather Service is for a one-minute average; gusts may be 25 to 30 percent higher.

Hail events can occur anywhere in Napa County. Since 2015, only one hail event has occurred, which was near Calistoga. The hail size was .25 inch.

High Wind

High wind hazards in Napa County are influenced by topography, elevation, and localized wind corridors, as illustrated in Figure 3-40 . The majority of the county experiences low to moderate average wind speeds (Wind Classes 1–2), particularly across the Napa Valley floor where terrain and vegetation reduce wind intensity. However, higher wind classes (Classes 3–4) are present in more exposed areas, including ridge lines, upper elevations, and narrow canyons, particularly in the northern and eastern portions of the county and near the Carquinez Strait in the south.

Wind is classified by the National Renewable Energy Laboratory (NREL) based on average speeds across the ground at different elevations in meters per second (m/s) and the amount of power it is capable of producing (wind power density), as provided in Table 3-55. The same wind event exhibits various speeds depending on elevation because of differences in the amount of friction encountered in proximity to the Earth's surface; this is most often measured at 10 and 50 meters above grade, or 33 and 164 feet, respectively. According to the Rayleigh wind speed distribution principle, speed increases 3% per 1,000 meters in elevation (or 5% per 5,000 feet). Power density is measured in the amount of watts (W) that can be produced per square meter (m^2) of surface area on the blades of a wind turbine.

Table 3-55: Classes of Wind Power

Wind Power Class	10 m (33 ft)		50 m (164 feet)[1]	
	Wind Power Density W/m²	Mean Speed[2] m/s (mph)	Wind Power Density W/m²	Mean Speed[2] m/s (mph)
1	≤ 100	4.4 (9.8)	≤ 200	5.6 (12.5)
2	100-150	5.1 (11.5)	200-300	6.4 (14.3)
3	150-200	5.6 (12.5)	300-400	7.0 (15.7)
4	200-250	6.0 (13.4)	400-500	7.5 (16.8)
5	250-300	6.4 (14.3)	500-600	8.0 (17.9)
6	300-400	7.0 (15.7)	600-800	8.8 (19.7)
7	>400	9.4 (21.1)	>800	11.9 (26.6)

Notes: [1]Vertical extrapolation of wind speed based on the 1/7 power law. [2]Mean wind speed is based on Rayleigh speed distribution of equivalent mean wind power density and is for standard sea level conditions.

Source: NREL, 2007

These higher wind zones are associated with terrain-driven wind acceleration, where winds are funneled through gaps, passes, and valleys or intensified along ridgelines. As a result, while average wind speeds are generally moderate, localized areas are subject to stronger and more damaging wind events, especially during winter storm systems and offshore wind conditions.

The most common impacts of high wind events in Napa County include power outages caused by downed trees and damaged power lines, which can disrupt critical services such as emergency response, water supply, and communications infrastructure. These impacts may be localized or widespread depending on the extent and duration of the event. Strong winds can also cause structural damage to buildings, particularly roofs and lightweight structures, as well as crop damage in agricultural areas, including vineyards.

High winds also play a critical role in wildfire behavior, as wind-driven conditions can rapidly spread fires and complicate suppression efforts. In addition, winds can contribute to soil erosion and debris movement, particularly in recently burned or disturbed areas.

Although most wind events are not life-threatening, they occur multiple times per year and represent an ongoing hazard due to their frequency and potential to disrupt infrastructure and daily activities. Wind speeds reported in forecasts are typically based on sustained (one-minute average) conditions; however, gusts may exceed these values by 25 to 30 percent, increasing the potential for damage.

Overall, the wind resource distribution in Napa County demonstrates that while much of the area experiences relatively low average wind speeds, localized high-wind zones—particularly along ridgelines and exposed terrain—present elevated risk for infrastructure damage, utility disruption, and wildfire spread.

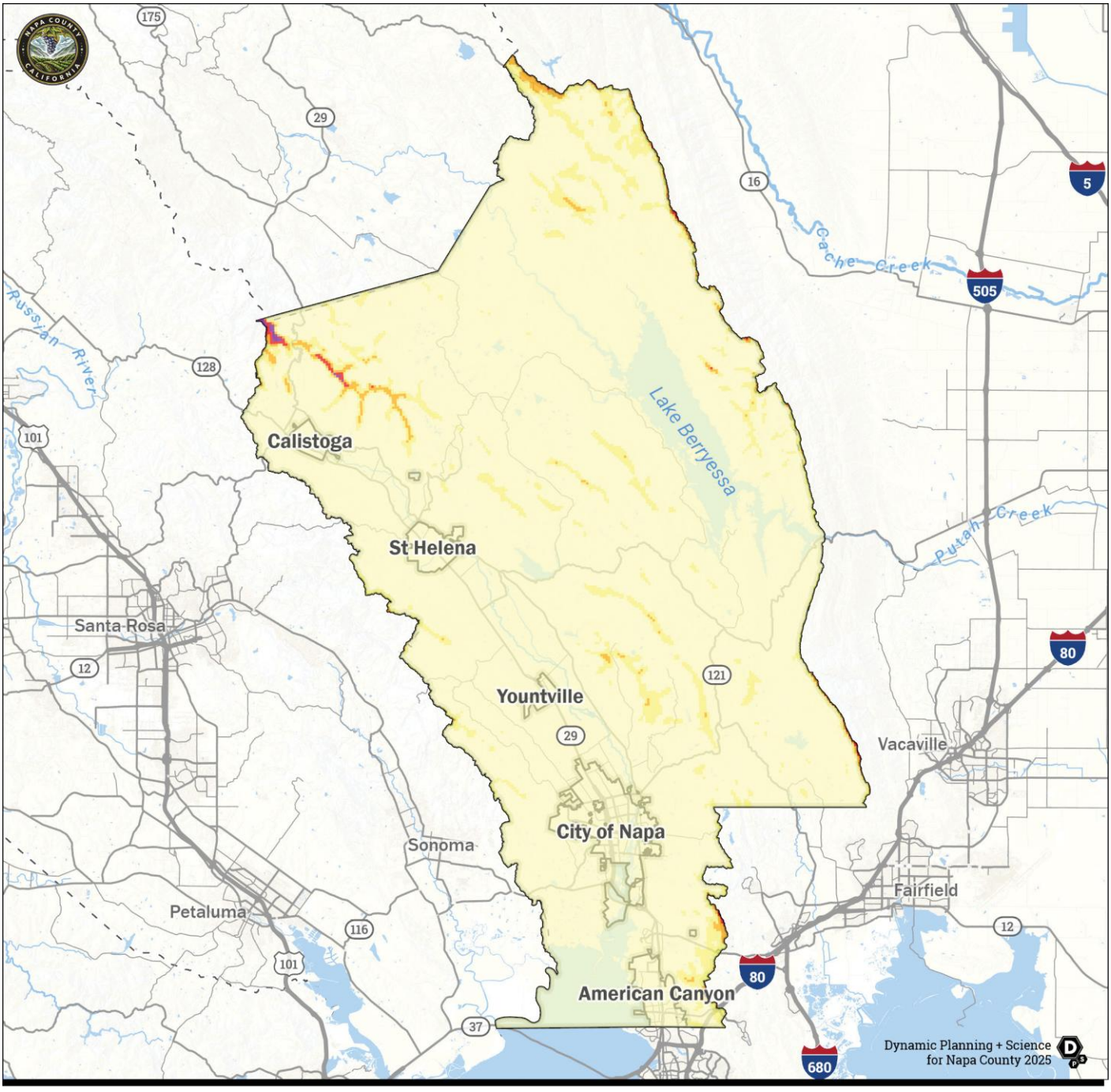


Figure 3-40: Napa County Annual Average Wind Speed (Power Class)

Heavy Rain

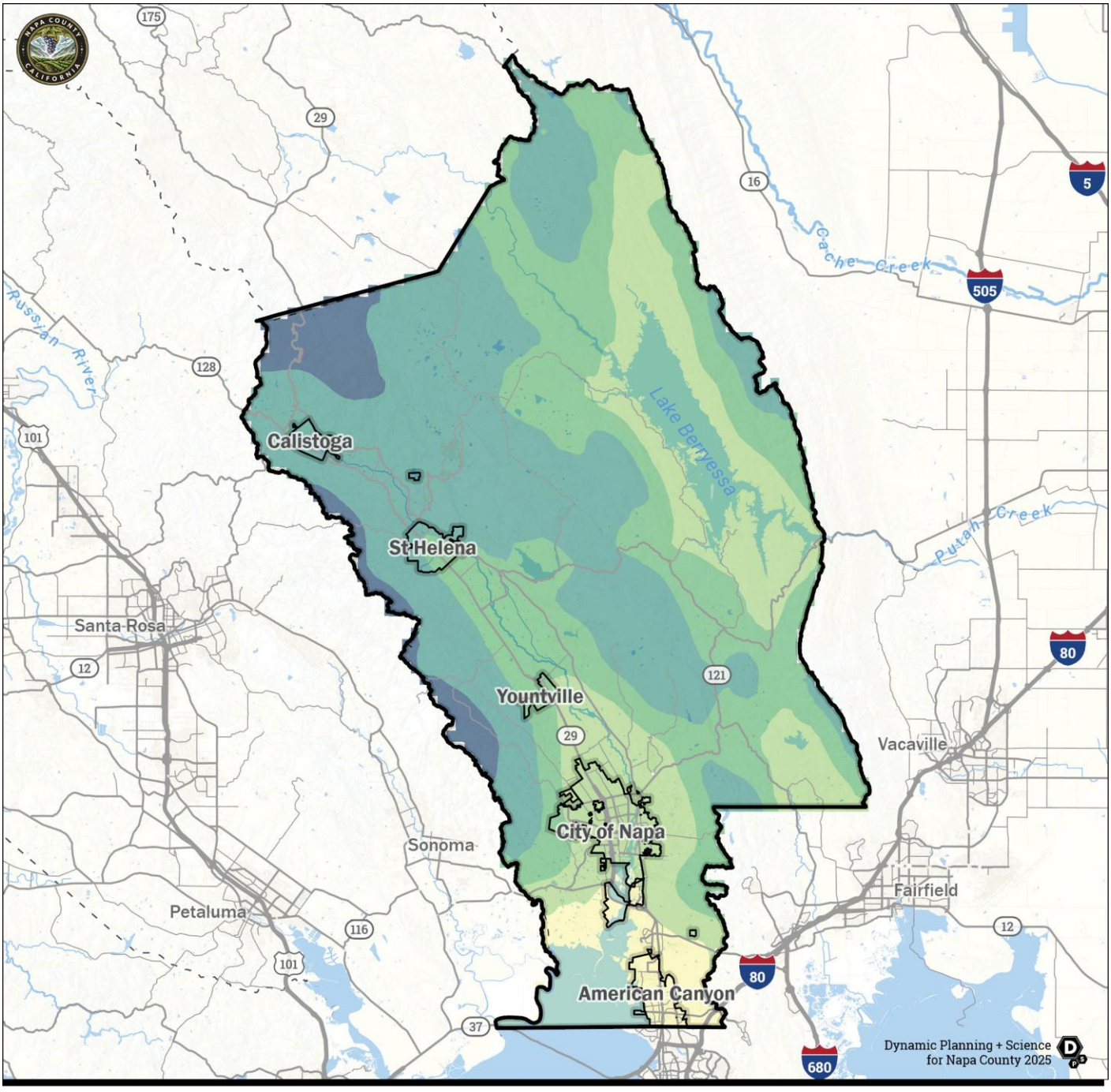
Heavy rain is a recurring hazard in Napa County, particularly during the winter months, and is closely associated with atmospheric river storm systems that can deliver prolonged, high-intensity precipitation. While heavy rain alone is rarely life-threatening, it is a primary driver of secondary hazards such as flooding, slope failure, debris flows, and erosion, which can result in significant impacts to life, property, and infrastructure.

As shown in Figure 3-41 (Average Annual Precipitation), precipitation patterns in Napa County vary significantly based on topography and elevation. Higher precipitation totals, generally ranging from 35 to over 50 inches annually, occur in the northern, western, and mountainous regions of the county, including areas around Calistoga and along the Mayacamas Range. In contrast, the southern and valley floor areas, including the City of Napa and American Canyon, receive comparatively lower annual precipitation, typically in the range of 20 to 30 inches.

These spatial variations influence the distribution of heavy rain impacts. Hillside and mountainous areas, which receive higher rainfall totals, are more susceptible to soil saturation, landslides, and debris flows, particularly during prolonged storm events or in areas affected by wildfire burn scars. In contrast, urbanized and low-lying areas are more vulnerable to localized flooding and stormwater system overload, especially where drainage infrastructure is limited or undersized.

Heavy rainfall also contributes to erosion and sediment transport, which can degrade water quality and impact watershed health. Sediment and debris may accumulate in channels and culverts, reducing their capacity and increasing the likelihood of localized flooding during subsequent storm events.

Although heavy rain events occur regularly, their impacts vary depending on storm intensity, duration, and antecedent conditions such as soil moisture and recent wildfire activity. Extreme precipitation events—particularly those associated with atmospheric rivers—have the potential to produce widespread and compounding impacts across multiple hazard types, making heavy rain a key driver of overall hazard risk in Napa County.



Average Annual Precipitation (1991-2020, Inches)
Unincorporated County
*Data sources: PRISM 30-Year Normals 1991-2020.

21 – 25	25 – 30	30 – 35	35 – 45	45 – 59

INCHES

Figure 3-41: Napa County Average Annual Precipitation

Winter Weather

Winter weather in Napa County is generally moderate in severity but can result in localized high-impact conditions, particularly in higher elevation areas such as the Mayacamas and Howell Mountain ranges. As shown in Figure 3-42 (30-Year Normal Minimum Temperature for January), minimum temperatures vary across the county, with colder conditions (mid-30s °F) occurring in northern and higher elevation areas, while warmer minimum temperatures (low 40s °F) are more typical in the southern valley floor and near San Pablo Bay. These temperature gradients contribute to the spatial variability of frost, freeze, and icing conditions.

Winter weather hazards in Napa County include freeze events, frost, black ice, and occasional snowfall at higher elevations. While snowfall is rare in valley areas, elevated terrain may experience light accumulation, leading to hazardous travel conditions. Cold temperatures, particularly during overnight and early morning hours, can result in ice formation on roadways, increasing the risk of vehicle accidents and temporary road closures.

The most common impacts of winter weather include transportation disruptions, power outages, and localized utility interruptions. Freezing conditions can damage infrastructure, including exposed pipes and electrical systems, while also affecting agricultural operations, particularly vineyards that are sensitive to frost and freeze events. Although widespread structural damage is uncommon, impacts to mobility and critical services are routine during cold weather events.

Winter weather is often associated with broader storm systems that also produce heavy rainfall and high winds, contributing to compound hazards such as flooding, downed trees, and slope failures. These combined conditions can exacerbate impacts, particularly in areas with limited access or infrastructure redundancy.

While fatalities are rare, extreme cold conditions can pose health risks, especially to unsheltered populations, older adults, and individuals with access and functional needs. Overall, winter weather in Napa County is best characterized as a moderate hazard with periodic high-consequence impacts, particularly in elevated and colder regions of the county.

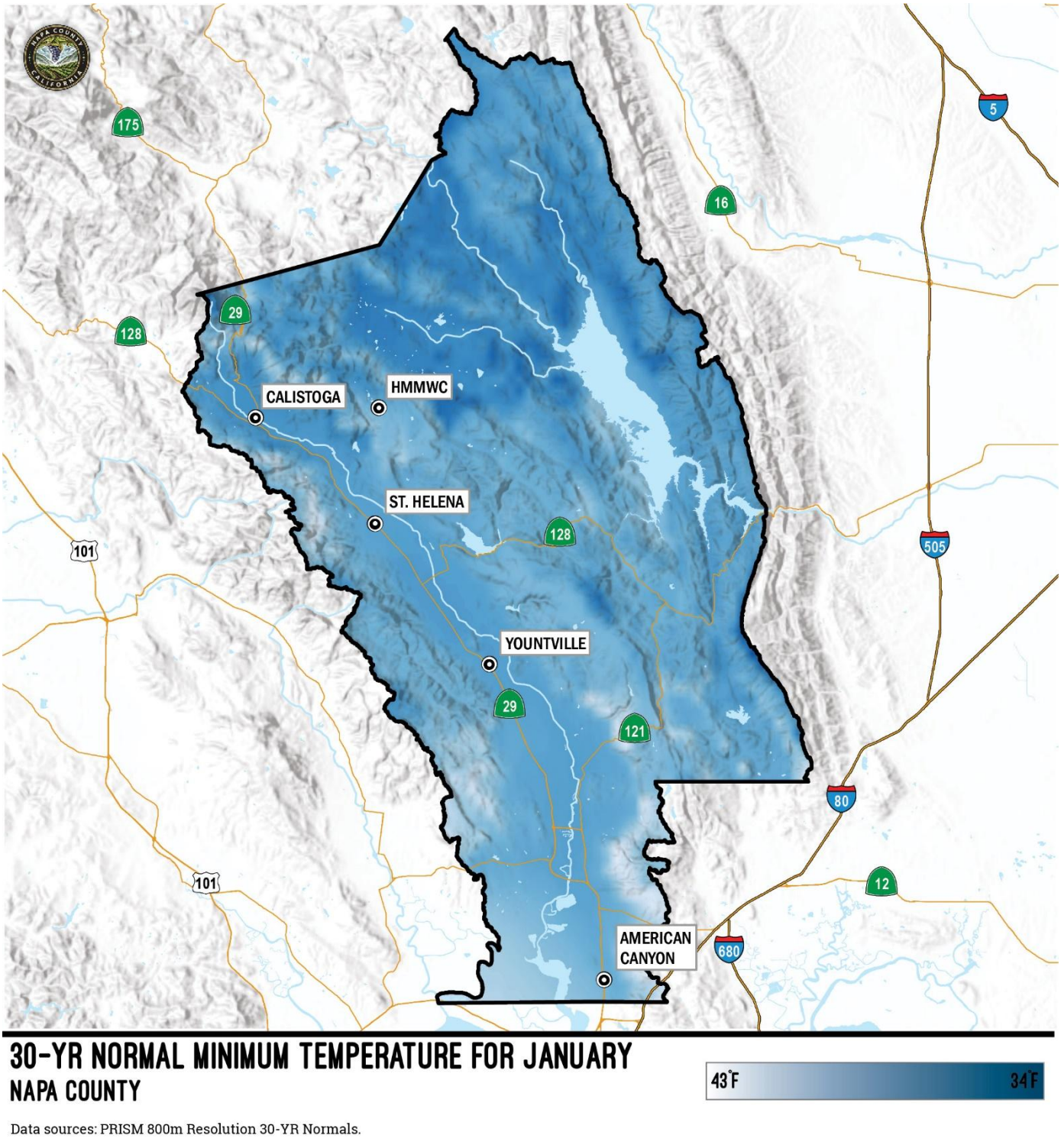


Figure 3-42: Napa County 30-Year Normal Minimum Temperature for January

3.3.7.8 Warning Time

Meteorologists can often predict the likelihood of a severe storm up to 10 days in advance. This can give several days of warning time. However, weather systems can stall or shift trajectory, thus making it difficult to predict total precipitation at specific locations. Further, some storms may come on more quickly and have only a few hours of warning time. High wind and heavy rain events can typically be predicted a few hours to a few days in advance, depending on the characteristics of the underlying severe weather system.

The ability to provide early warning for severe weather hazards in Napa County depends on monitoring systems, weather radar, and alert services. The region benefits from forecasting tools provided by the NWS, NOAA, and local emergency management agencies, which use weather stations, stream gauges, weather radar, and satellite data to issue timely warnings for hazards.

Napa County is served by the NWS San Francisco Bay Area/Monterey forecasting office located next to the Monterey Regional Airport and Naval Research Laboratory in Monterey County. The office serves a total of 11 counties throughout the San Francisco and Monterey Bay regions with a population of more than eight million residents. Radar coverage in Napa County is primarily provided by an NWS-operated, next generation WSR-88D radar (KMUX) located on Mount Umunhum southwest of the county just south of the San Jose Metro Area.

3.3.7.9 Severe Weather Vulnerability Assessment

Recent history indicates that Napa County has a high vulnerability to severe weather events due to its location and topography. Severe weather will continue to impact the people, properties, and critical facilities and infrastructure all across the county to varying degrees, causing damage and potentially threatening lives.

3.3.7.9.1 Population

It can be assumed that the entire planning area is exposed to some degree of severe weather events. However, certain locations face greater risk due to their geographic setting and local climate conditions.

Vulnerable population groups such as older adults, people living in older housing, low-income households, individuals who speak limited English, those with serious health conditions, and residents in areas with restricted access are at the highest risk of severe weather impacts. Extended power outages can pose life-threatening risks for individuals who rely on electricity for medical support, and cold temperatures can endanger those without reliable shelter or heating. Isolation of these populations during winter storms is a significant concern, as it may hinder access to warming centers, emergency services, and life-sustaining resources.

Disproportionately Impacted Populations

High Wind

High wind impacts in Napa County are experienced countywide but are most severe in exposed ridgelines, hillside communities, and wildland-urban interface (WUI) areas, particularly in the northern and eastern portions of the county. Populations in these areas are more vulnerable to power outages, downed trees, and road blockages, which can disrupt access to essential services.

Rural and hillside communities often rely on limited access routes and overhead utility infrastructure, increasing the likelihood of isolation during wind events. Residents in these areas—including those in parts of Angwin, Pope Valley, and other unincorporated communities—may experience prolonged outages or delays in emergency response.

As described in Section 1.5.3, individuals with access and functional needs, including older adults, persons with disabilities, and those who are medically dependent on electricity, are particularly vulnerable to power disruptions. In addition, low-income households may have limited ability to prepare for or recover from wind-related damages, including tree removal or structural repairs. Public Safety Power Shutoff (PSPS) events implemented during high wind conditions may further compound these impacts for vulnerable populations.

Heavy Rain

Heavy rain impacts are most pronounced in areas susceptible to flooding, poor drainage, and slope instability, including low-lying valley areas and steep hillside terrain. Communities located along the Napa River corridor and its tributaries, as well as urbanized areas such as the City of Napa and American Canyon, may experience localized flooding and stormwater system overload during intense rainfall events.

Hillside and mountainous areas are particularly vulnerable to landslides and debris flows, especially in locations affected by prior wildfires. Burn scar areas have reduced vegetation and soil stability, increasing the likelihood of slope failure during heavy rain events. Residents in these areas may face elevated risk due to limited evacuation routes and potential isolation.

Populations disproportionately impacted by heavy rain include low-income households, renters, and residents in older or inadequately drained housing, who may be more susceptible to flood damage and have limited resources for recovery. Additionally, individuals with access and functional needs may face greater challenges during evacuation or service disruptions. Rural populations dependent on limited infrastructure may also experience prolonged impacts due to road closures and utility interruptions.

Winter Weather

Winter weather impacts in Napa County are generally concentrated in higher elevation areas, including the Mayacamas and Howell Mountain regions, where colder temperatures increase the likelihood of frost,

freezing conditions, and occasional snowfall. Populations in these areas may face hazardous travel conditions, power outages, and temporary isolation, particularly during winter storm events.

Because freezing conditions are relatively infrequent in Napa County, communities may be less prepared for impacts such as icy roadways and infrastructure disruptions. Rural residents in higher elevations may experience limited access to emergency services due to steep terrain and constrained transportation networks.

Vulnerable populations, including unsheltered individuals, older adults, and those without adequate heating or shelter, may face increased health risks during cold weather events. Additionally, individuals with limited mobility or transportation access may have difficulty reaching warming centers or essential services during extreme cold conditions.

3.3.7.9.2 Property

All property in Napa County is exposed to severe weather hazards; however, the level of risk varies based on location, structural condition, and surrounding environmental factors. Structures located in exposed areas such as ridgelines, hillside communities, and narrow canyons are more susceptible to damage from high winds, including impacts from falling trees and debris. These risks are particularly pronounced in the wildland-urban interface (WUI) and higher elevation areas, where wind speeds may be locally intensified by terrain.

Winter weather can exacerbate these vulnerabilities, particularly in higher elevation regions where freezing temperatures and occasional frost or snow events occur. Cold conditions can affect building materials, increase stress on roofs and utility infrastructure, and contribute to ice accumulation on roadways and power lines, leading to service disruptions and access limitations.

Heavy rainfall presents additional risks to property by saturating soils and increasing instability, which can result in downed trees, localized flooding, and slope failures. Properties located near steep slopes, drainage channels, or along the Napa River and its tributaries may be more vulnerable to foundation damage, erosion, and loss of access during storm events. In areas affected by prior wildfires, burn scars can further increase susceptibility to debris flows and slope instability during intense rainfall.

Agricultural properties, particularly vineyards, are also vulnerable to severe weather. High winds, heavy rain, and freeze events can damage crops, erode soils, and disrupt growing cycles, resulting in economic losses.

According to Napa County Assessor data, a substantial portion of the building stock was constructed prior to modern building codes, particularly before the adoption of updated seismic and structural standards in the late 20th century. As a result, many structures may be more vulnerable to wind, rain, and cold weather impacts if they have not been retrofitted or otherwise improved. Additionally, some properties located near waterways or on challenging terrain were developed prior to current setback and grading requirements, increasing their exposure to flooding, erosion, and slope failure during severe weather events.

3.3.7.9.3 Critical Facilities & Infrastructure

All critical facilities are exposed to severe weather events. Facilities located on elevated terrain or within forested areas are more susceptible to wind damage, either directly or from falling trees. However, the most significant concern during severe weather is not the structural vulnerability of facilities themselves, but rather the potential for damage to roads, utilities, communications systems, and other essential infrastructure that support facility operations.

The most frequent issues during severe weather events include power outages and the resulting cascading impacts on utility systems. Downed power lines can lead to widespread blackouts, leaving entire communities without electricity. Loss of power can also disrupt phone service, water supply, and wastewater systems. Roads may become blocked or impassable due to flooding, fallen trees, or landslides triggered by heavy rainfall. High winds can bring down trees and power lines, obstructing transportation routes, delaying emergency response, and isolating communities. Snowstorms in higher elevations can significantly impact the transportation system and the availability of public safety services. Of particular concern are roads providing access to isolated areas and to vulnerable populations. Freezing of power and communication lines can cause them to break, disrupting electricity and communication.

Roadways that serve isolated areas and vulnerable populations are of particular concern, as access may be compromised during or after a storm. In addition, power and communication outages can have a disproportionate effect on seniors, individuals with medical conditions, and others who may be unable to seek help without functioning phone or transportation services. Prolonged closures of major routes can interrupt the flow of goods and services, disrupting the regional economy and delaying recovery efforts. Large, long-lasting storms can result in significant economic losses and strain on public resources.

Facilities and infrastructure in Napa County's rural and hillside communities are among the most vulnerable to severe weather impacts, particularly in areas with limited access and overhead utility systems. These locations may experience extended power and communication outages following major storm events. High wind events occurring in combination with heavy rainfall are especially disruptive, as saturated soils increase the likelihood of downed trees, slope instability, and debris accumulation. These conditions can damage transportation networks, obstruct waterways and drainage systems, and further delay restoration of essential services.

3.3.7.10 Development Trends

All current and future development will be affected by severe weather. However, older existing development is more susceptible than more recent development which complies with current standards.

The ability to withstand impacts lies in the consistent application and enforcement of codes and regulations for new construction. The county and other participating jurisdictions have adopted and comply with the mandated California Building Code, which is equipped to deal with the threats of severe weather events. Land use policies identified in general plans within the planning area also address many of the secondary

impacts triggered by high wind or heavy rain, such as flood and landslide. However, not unlike wildfire, the proximity of residents to forested and steep slope areas places them at elevated risk of landslides and tree fall during severe weather. These localized risks, which persist despite code requirements, underscore that regulatory tools alone do not make the community fully equipped to manage all consequences of future growth and severe weather events.

3.3.7.11 Climate Change Impacts

Severe weather in Napa County—including atmospheric river storms, intense precipitation events, and high wind conditions—is expected to intensify as a result of climate change. Warmer atmospheric conditions are projected to increase the frequency and intensity of extreme rainfall, while changes in regional weather patterns may contribute to more variable and episodic storm events. These conditions can lead to greater stress on infrastructure systems, increased risk of flooding and slope failure, and more frequent utility disruptions. High wind events, particularly when occurring in conjunction with saturated soils, can further amplify damage by increasing the likelihood of downed trees and power lines.

Direct Impacts

Severe weather events can damage or overwhelm critical infrastructure systems, including stormwater conveyance, transportation networks, and overhead utilities. Intense rainfall may exceed the capacity of drainage systems, resulting in localized flooding, roadway damage, and temporary isolation of communities. High winds can cause widespread power outages and communication disruptions by damaging electrical and telecommunications infrastructure. Critical facilities—including emergency services, water and wastewater systems, and community support facilities—may be impacted by these disruptions, particularly where backup power or system redundancy is limited.

Secondary Hazards

Severe weather in Napa County frequently results in cascading and compounding impacts. Prolonged or intense rainfall can increase slope instability, leading to landslides and debris flows in hillside and wildfire-affected areas. These events can damage infrastructure, block roadways, and disrupt water and wastewater services. Storm-related debris and vegetative damage may also contribute to increased wildfire fuel loads, elevating future fire risk. Extended utility outages and infrastructure disruptions can further strain emergency response systems and delay recovery efforts.

Public Health & Social Impacts

The impacts of severe weather are not experienced equally across Napa County. As described in Section 1.5.3, low-income households, older adults, individuals with access and functional needs, and rural populations may be disproportionately affected. These populations may have limited resources to prepare for or recover from storm events, including reduced ability to invest in backup power, home hardening, or flood protection measures.

Residents in rural and hillside areas may be particularly vulnerable due to limited access routes and greater exposure to power outages and infrastructure disruptions. Individuals who rely on electricity for medical equipment or essential services face increased health risks during prolonged outages. Additionally, language barriers and limited access to information may reduce the effectiveness of emergency communications for some populations.

Severe weather can also contribute to public health concerns, including injury risks during storm events, reduced access to emergency services, and stress associated with prolonged disruptions to housing, utilities, and transportation.

3.3.7.12 Severe Weather Hazard Problem Statements

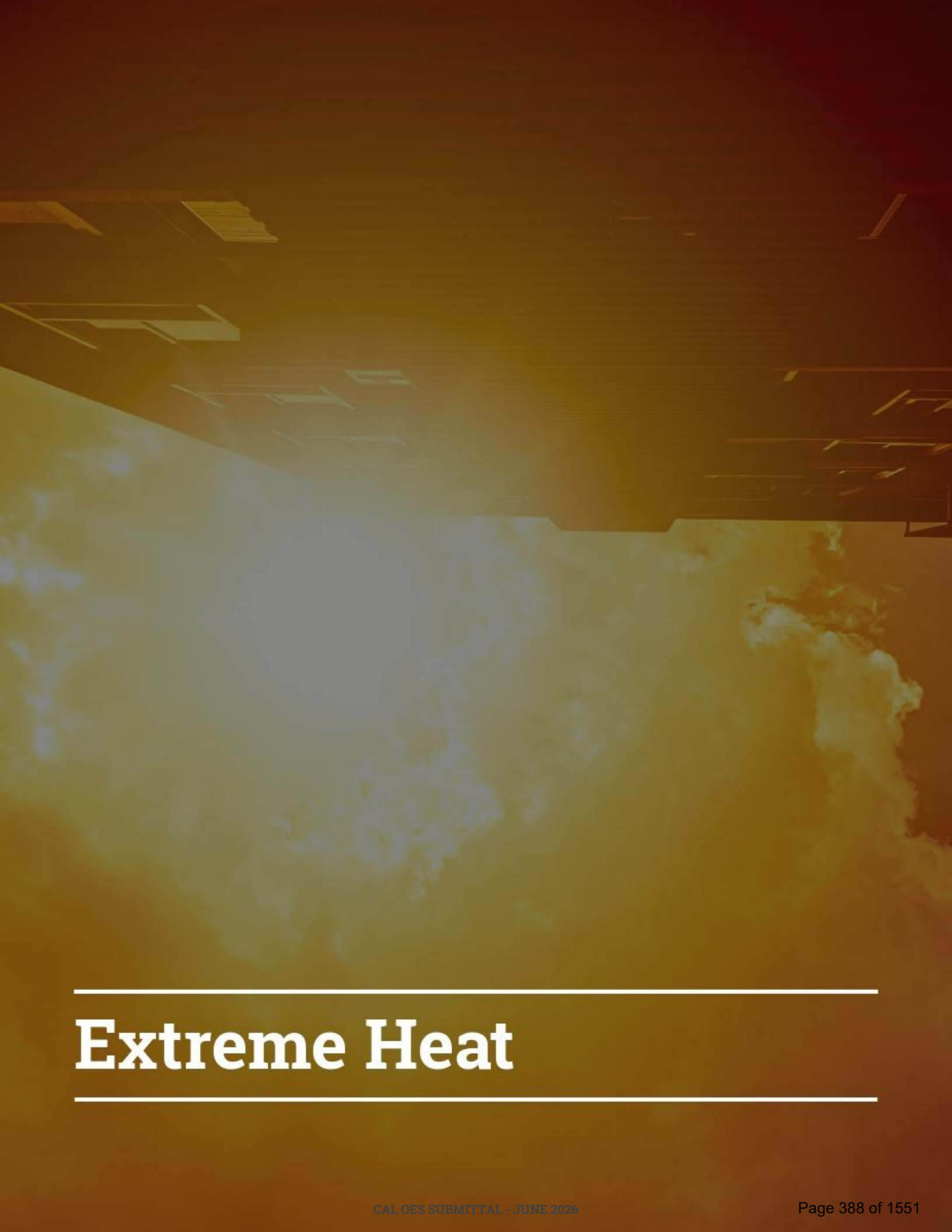
As part of the mitigation action identification process, the Napa County Planning Team developed areas of concern (i.e., problem statements) that summarize the county's most pressing severe weather-related vulnerabilities and challenges. The problem statements were developed based on the updated risk assessment and vulnerability analysis contained herein, as well as the team's local knowledge and experience and community input. The problem statements address a broad spectrum of concerns, from direct impacts on residents and vulnerable populations to threats to critical infrastructure and long-term recovery.

These problem statements are not intended to be all-encompassing or to describe each and every issue associated with severe weather. Instead, they highlight the most urgent concerns that can be addressed within the scope of this MJHMP. Each statement will be linked to at least one mitigation action, ensuring that identified needs are met with specific, measurable, and equitable solutions. Table 3-56 presents the severe weather hazard problem statements for Napa County, along with their associated areas of concern and reference numbers for cross-linking to the mitigation actions in Table 4-4.

Table 3-56: Napa County Severe Weather Hazard Problem Statements

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-FL-NCo-130	Severe Weather	Threat	**Napa County**	Inadequate stormwater management practices have reduced flood storage and conveyance capacity and exacerbate downstream and localized flooding during heavy rain events.	ma-FL-NCo-62, ma-FL-NCo-63, ma-DR-NCo-26, ma-CC-NCo-13, ma-FL-NCo-51, ma-FL-NCo-54, ma-FL-NCo-57
ps-SW-NCo-144	Severe Weather	Threat	**Napa County**	Intense winter storms, including heavy rain and high winds, can trigger localized flooding, infrastructure damage, power outages, and increase wildfire ignition risk due to downed lines	ma-SW-NCo-81, ma-SW-NCo-82, ma-AH-NCo-5, ma-AH-NCo-4, ma-CC-NCo-15, ma-FL-NCo-51, ma-FL-NCo-54, ma-FL-NCo-57

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-SW-NCo-391	Severe Weather	Victim	**Napa County**	Vulnerable populations, such as seniors, people living in older housing, low-income households, unhoused persons, and those with serious health conditions, are at the highest risk of severe weather impacts including from extended power outages, cold temperatures and inadequate shelter, and isolation in areas with limited access.	ma-AH-NCo-4, ma-AH-NCo-6
ps-SW-NCo-393	Severe Weather	Impact	**Napa County**	Winter weather brings heavy rains and, occasionally, freezing temperatures and ice, which can have devastating impacts on grape vines and other crops and can cause power outages from downed trees, limbs, and power lines.	ma-AH-NCo-4, ma-AG-NCo-1
ps-SW-NCo-394	Severe Weather	Impact	**Napa County**	Windstorms can cause downed trees, power outages, and damage to buildings and roofs, often disrupting services and blocking access routes.	ma-AH-NCo-4



Extreme Heat

3.3.8 Extreme Heat Hazard Profile



Extreme heat is defined as temperatures that are much hotter and/or more humid than average for a particular location and the time of year. In Napa County, an extreme heat day that exceeds the 98th percentile of daily maximum temperatures is one at or above 90°F, and a warm night (also exceeding the 98th percentile) is one at or above about 55°F. A heat wave is an extended period of extreme heat days or warm nights, lasting days to weeks.

As a climate change-driven hazard, unusually hot and humid summer days and warm nights have become more common since the 1960s. (Bole, et al., 2018) The effects of extreme heat are amplified in urban centers such as in an around the Cities of American Canyon, Calistoga, Napa, and St. Helena, and the Town of Yountville, with consequences for health, air quality, and utilities.

Studies show that by the end of this century, the number of days with temperatures reaching 100°F or more is projected to increase dramatically across the United States as a result of climate change. What the public now considers to be an exceptional event could become routine across much of the country. As temperatures rise and extreme heat events become longer, more severe, and more frequent, experts expect to see more health problems and deaths caused by heat.

Heat has a greater toll on human health—as measured by deaths (mortality) and negative health outcomes (morbidity)—than all other natural disasters combined. (NIHHIS, 2021) In California, a high number of heat-related deaths occurred in 2006, when a record-breaking heat wave between July 15 and August 1 in Northern California was linked to 650 deaths and 16,000 excess emergency room visits. (California Office of Environmental Health Hazard Assessment, 2019) Heat waves and events are anticipated to increase in frequency, severity, and duration as climate change progresses in the coming decades.

Heat-related death and illness are widely regarded as preventable within the public health community; despite this, extreme heat kills over 600 people in the U.S. annually. (CDC, 2021) The following populations face specific vulnerability to heat-related illness:

- Seniors aged 65+, especially those who live alone;
- Infants and children;
- Low-income households;
- Unhoused people;
- Individuals with chronic underlying medical conditions;
- Athletes; and
- Agricultural and other outdoor workers.

The cumulative impacts of extreme heat events, along with smaller, longer-term differences in seasonal average temperatures, exacerbate inequities in health outcomes among already at-risk groups. (NIHHIS, 2021) Heat impacts are distributed inequitably among low-income communities of color in the United

States. On average, Black and Latino households are more cost-burdened, occupy denser housing stock, and have lower access to heat-coping strategies, such as air conditioning and access to green space.

Within Napa County, geographic patterns in extreme heat are mostly influenced by topography. While extreme heat days are defined by localized variation from norms, the inland valley areas tend to experience higher temperatures than coastal or mountain areas. That being said, air conditioning systems are less prevalent in the county and the population may be less adapted to higher temperatures compared to regions which regularly experience high heat events.

Although Napa County is mostly rural, there are clusters of highly urbanized areas. Urbanized areas experience higher temperatures than natural landscapes, creating localized pockets of higher temperatures known as heat islands. Roads and conventional building materials reflect less solar energy and absorb and re-emit more heat compared to trees and other vegetation. Heat islands can build throughout the day and worsen immediately after sunset as heat is slowly released from pavement and building material. The graph in Figure 3-43 demonstrates the impact of increased urbanization in relation to diurnal fluctuation of temperature extremes, with urban areas sometimes experiencing daytime highs 7°F greater than surrounding non-urban environments. (EPA, 2024)

Urban heat islands disproportionately affect low-income urban populations and people of color, communities who are more likely to occupy older, higher density housing stock with lower urban forest cover and less access to air conditioning. A 2020 study of 108 urban areas across the U.S. found that neighborhoods subjected to federal redlining policies in the first half of the 20th century, which discouraged investment in neighborhoods with high minority populations, currently experience surface temperatures approximately 5˚F higher than their non-redlined counterparts. (Hoffman, Shandas, & Pendleton, 2020)

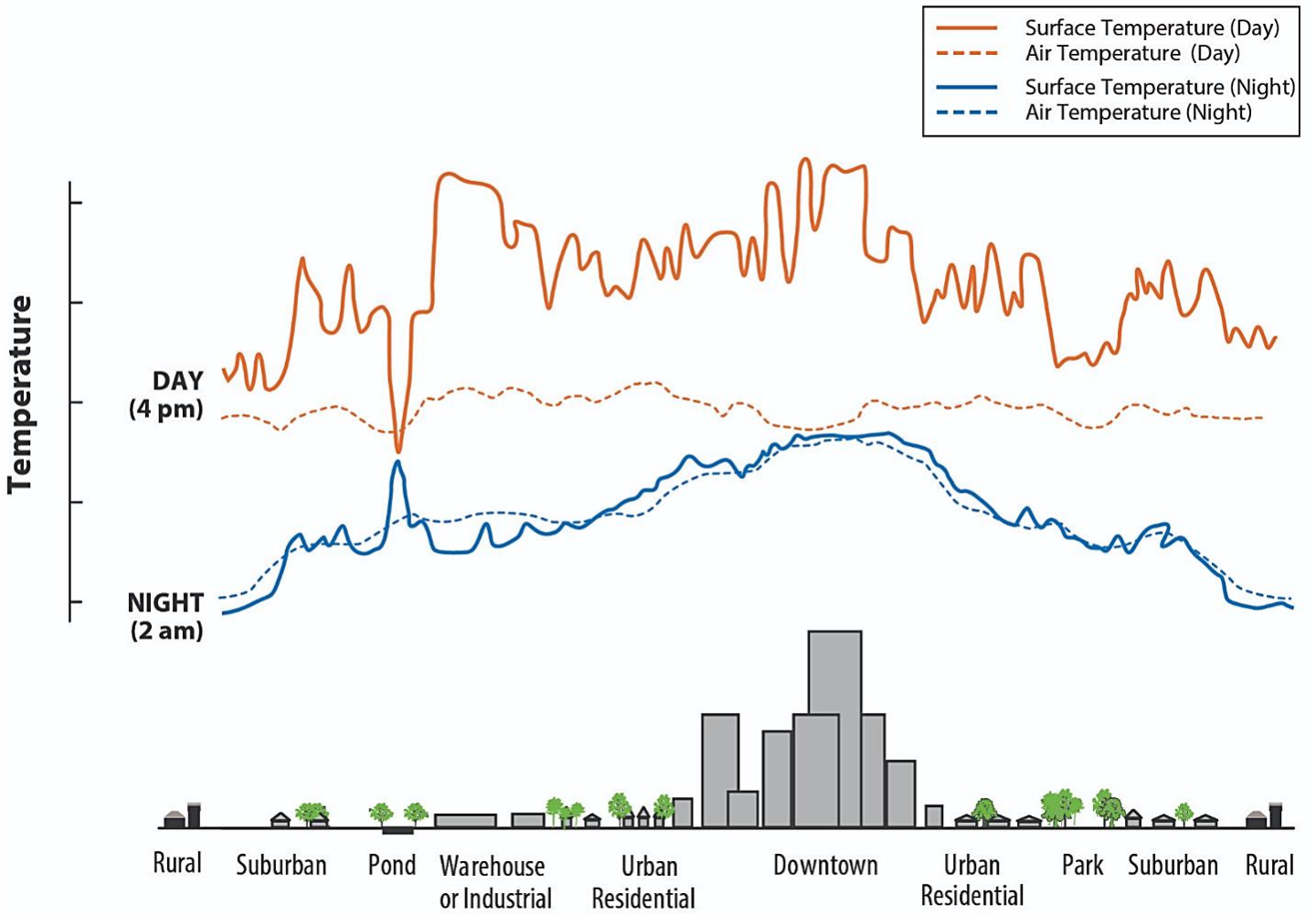


Figure 3-43: Day and Night Urban Heat Island Effect Across Natural and Built Landscapes

Source: U.S. Environmental Protection Agency

3.3.8.1 Secondary & Compounding Hazards

The most significant secondary hazards associated with extreme heat events are increased public health risks from heat-related and vector-borne illness, wildfires fueled by heat-related vegetation die-off and stress, and power outages. Climate change is the main driving force behind the increase in extreme heat events and is further discussed in Section 3.3.9.

High Heat / Heat Waves

Heat waves are periods of abnormally hot weather lasting days to weeks. The number of heat waves has been increasing in recent years across the Country and locally. Climate change will continue to cause extreme heat events more often. Studies show that by the end of this century, the number of days with temperatures reaching 100°F or more is projected to increase dramatically across the United States as a result of climate change. What the public now considers to be an exceptional event could become routine

across much of the country. As temperatures rise and extreme heat events become longer, more severe, and more frequent, experts expect to see more health problems and deaths caused by heat. (Prevention).

According to information provided by FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks. Heat kills by taxing the human body beyond its abilities. In a normal year, about 175 Americans succumb to the demands of summer heat. According to the National Weather Service (NWS), among natural hazards, only the cold of winter—not lightning, hurricanes, tornados, floods, or earthquakes—takes a greater toll. (National Weather Service, 2020) In the 40-year period from 1936 through 1975, nearly 20,000 people were killed in the United States by the effects of heat and solar radiation. In the heat wave of 1980, more than 1,250 people died. (Disasters Are Us, n.d.)

Wildfire & Air Quality

Extreme heat often coincides with conditions favorable to wildfires and contributes to vegetation stress and mortality, fueling these hazards. Wildfires during extreme heat events can place excess health burdens on wildland firefights, impeding fire containment. Extreme heat further increases the negative effects of poor air quality from particulates like smoke as well as ozone-related sensitivities. While wildfires do not always present during extreme heat events, extreme heat always increases the risk of human health impacts to poor air quality. Climate change has a long-term negative effect on air quality metrics, including ozone. (State of California, 2018)

Power Outages

High temperatures may increase peak electricity demand beyond system capacity as residents switch on air conditioning units. Loss of power during a high heat poses a risk to human health by limiting access to air conditioning and disrupting continuous power supply for medical equipment. In California, high heat days may also coincide with conditions that trigger Public Safety Power Shutoff (PSPS) events by utility providers to curb wildfire ignition risk from faulty powerline equipment, which could disrupt residential power supply for air conditioning and at-home medical equipment.

Climate Change

The state and county have seen increased average temperatures, more extremely hot days, fewer cold nights, and shifts in the water cycle from climate change. Increased greenhouse gases in the atmosphere raises temperatures and alters seasonal temperature patterns. Effects can include changes in average temperature, the timing of seasons, and the degree of cooling that occurs in the evening. In addition to new seasonal temperature patterns, extreme events such as heat waves are projected to occur more frequently and last for longer periods of time. Though extreme heat may be moderated in the county's coastal location, inland areas can experience much higher temperatures, and even under reduced emissions scenarios, climate change is expected to increase the frequency, intensity, and duration of extreme heat events in the Napa County region.

3.3.8.2 Policies, Plans & Regulatory Environment

Very few formal regulations exist which pertain to extreme heat, except for workplace safety standards for outdoor workers. There are no state or local regulations pertaining to cooling technology standards for general residential buildings, but places of work, senior residential facilities, schools, and childcare centers are subject to state regulations for indoor air temperature standards. However, there is an extensive regulatory environment concerning climate change in that profile under Section 3.3.9.

State Regulatory Environment

California Outdoor Heat Illness Prevention Standard

Title 8, Section 3395 of the California Code of Regulations establishes an Outdoor Heat Illness Prevention Standard for employers of outdoor workers. Established in 2006, it requires employers to provide water and shade access; to develop a heat illness prevention plan; and provide heat illness prevention and response training to employees. Specific procedures must be followed for temperatures exceeding 80°F and 95°F. Employers must provide shade, water, and monitor for signs of heat illness. Workers also have a right to request breaks to cool off.

Local Regulatory Environment

Napa County General Plan

The Napa County General Plan Safety Element (2023 Update) establishes goals and policies that support preparedness for extreme heat events, which are increasing in frequency and intensity due to climate change. Extreme heat poses risks to public health, energy systems, and water supply, particularly during prolonged heat waves. The following goal and policies are particularly relevant to extreme heat hazards:

- **Goal SAF-2:** The County will be prepared in the event of a disaster to protect residents and businesses from impacts and further harm, while initiating post-disaster recovery and reconstruction as soon as feasible.
- **Policy SAF-2.5:** Protect vulnerable populations during hazard events. The County shall coordinate with municipalities, emergency response providers, and community organizations to identify individuals at increased risk during extreme heat events—including older adults, medically vulnerable individuals, and those without access to cooling—and to mobilize resources such as cooling centers, transportation, and outreach services.
- **Policy SAF-2.2 and SAF-2.6:** Enhance emergency communication systems. The County supports the use of multiple communication platforms, including Alert Napa County and other emergency notification systems, to provide timely heat advisories, public health warnings, and resource information during extreme heat events.
- **Policy SAF-2.3 and SAF-2.19:** Maintain continuity of critical services. The County will support the structural and operational integrity of essential public services during extreme heat events,

including ensuring reliable power supply and backup systems at critical facilities such as cooling centers, medical facilities, and water infrastructure, which may experience increased demand during heat waves.

- **Policy SAF-2.9 and SAF-2.21:** Support the agricultural sector and workforce. The County will coordinate with agricultural organizations to disseminate emergency preparedness information and provide resources to protect farmworkers and outdoor workers who are particularly vulnerable to heat-related illness during extreme temperature events.
- **Policy SAF-9.1:** Provide resources to vulnerable populations. The County will conduct outreach and support access to cooling facilities, hydration resources, and emergency services for populations most at risk during extreme heat, including low-income households, renters, and individuals with limited access to air conditioning.

3.3.8.3 Past Events

Napa County has experienced a series of extreme heat events over the past several decades, with increasing frequency and intensity in recent years. These events are often associated with prolonged high temperatures exceeding 100°F, particularly in inland valley areas, and are frequently compounded by drought conditions and elevated wildfire risk. The following notable events illustrate the historical occurrence of extreme heat in Napa County and demonstrate how these conditions have contributed to impacts on public health, infrastructure, and the County's agricultural economy.

- **July 2011 – July 2012:** Napa County experienced multiple multi-day heat events, with temperatures exceeding 100°F. These events highlighted the recurring nature of extreme heat and its impacts on agriculture and energy demand.
- **August 2017:** A prolonged and intense heatwave affected Napa County, with sustained high temperatures over several days. The event significantly impacted vineyard operations, increasing irrigation demand and stressing crops during the growing season.
- **August – October 2020:** Extreme heat and dry conditions contributed to the LNU Lightning Complex Fires, which burned over 360,000 acres regionally, including portions of Napa County. The event demonstrated the strong relationship between heat, drought, and wildfire risk, resulting in widespread damage and disruption.
- **September 6, 2022:** Napa County recorded its highest temperature on record (~115°F) during a regional heatwave. This event placed significant stress on public health systems, energy infrastructure, and vulnerable populations, and represents a benchmark extreme heat event for the County.
- **August 2025:** A multi-day extreme heat event contributed to conditions that led to the Pickett Fire, resulting in evacuations and impacts to rural communities. The event highlights the continued role of extreme heat in driving wildfire ignition and spread.

3.3.8.4 Location

Extreme heat impacts are experienced throughout Napa County; however, the intensity and frequency of high temperatures vary spatially based on topography, elevation, and proximity to marine influences. As shown in Figure 3-44 (Napa County 30-Year Normal Maximum Temperature for July), the highest temperatures are typically concentrated in the interior valley and northern portions of the county, including areas around St. Helena and Calistoga. These areas are more susceptible to extreme heat due to their inland location and limited marine cooling influence.

In contrast, southern portions of the county, including the City of Napa and American Canyon, generally experience moderated temperatures due to the influence of San Pablo Bay, which provides cooling through marine air flow and fog intrusion. Higher elevation areas may also experience slightly lower daytime temperatures; however, they can still be subject to elevated nighttime temperatures, which contribute to heat stress. Overall, while extreme heat is a countywide hazard, the greatest exposure occurs in inland valley areas, where prolonged high temperatures and limited time cooling increase the potential for impacts to public health, agriculture, and energy demand.

3.3.8.5 Frequency & Probability of Future Occurrences

Napa County is expected to experience an increase in the frequency and intensity of extreme heat events as the climate continues to warm. Current best practices for evaluating heat risk focus on threshold-based indicators, such as the number of days exceeding 95°F and nighttime temperatures remaining above 65°F, rather than changes in average annual temperature. These metrics better reflect community exposure to hazardous heat conditions. Climate projections indicate that both extreme heat days and warm nights will become more frequent, increasing stress on public health systems, energy infrastructure, and vulnerable populations.

Based on historical trends, projected climate conditions, and the County's risk assessment framework, the probability of extreme heat events occurring in Napa County is considered highly likely (approaching a 100 percent annual probability). As shown in the risk matrix, extreme heat is characterized by high frequency and significant potential impacts, reinforcing its classification as a priority climate-related hazard requiring continued mitigation and adaptation planning.

According to Cal-Adapt, the county will likely experience a climate change-driven increase in extreme heat days from four days per year to 22 days per year by the end of the century under a medium emissions scenario (RCP 4.5). Over the same time period, the county is also likely to see an increase in warm nights from five per year to 39. Table 3-57 explains the extreme heat event thresholds for Napa County.

Table 3-57: Cal-Adapt Extreme Heat Terms and Thresholds

Term	Cal-Adapt Definition	Thresholds for Napa County
Extreme Heat Day	Defined as a day in a year when the daily maximum/minimum temperature exceeds the 98th percentile of daily maximum/minimum temperatures based on observed historical data from 1961-1990 between April and October.	**98.6°F**
Warm Night	Defined as a day in April through October when daily minimum temperature exceeds the 98th historical percentile of daily minimum temperatures, based on observed data from 1961-1990 between April and October.	**59.5°F**
Heat Wave	Defined as four consecutive days or nights above the extreme heat / warm night threshold.	**3 days ≥ 98.6°F** or **4 nights ≥ 59.5°F**

Source: Cal-Adapt Extreme Heat Days and Warm Nights Tool

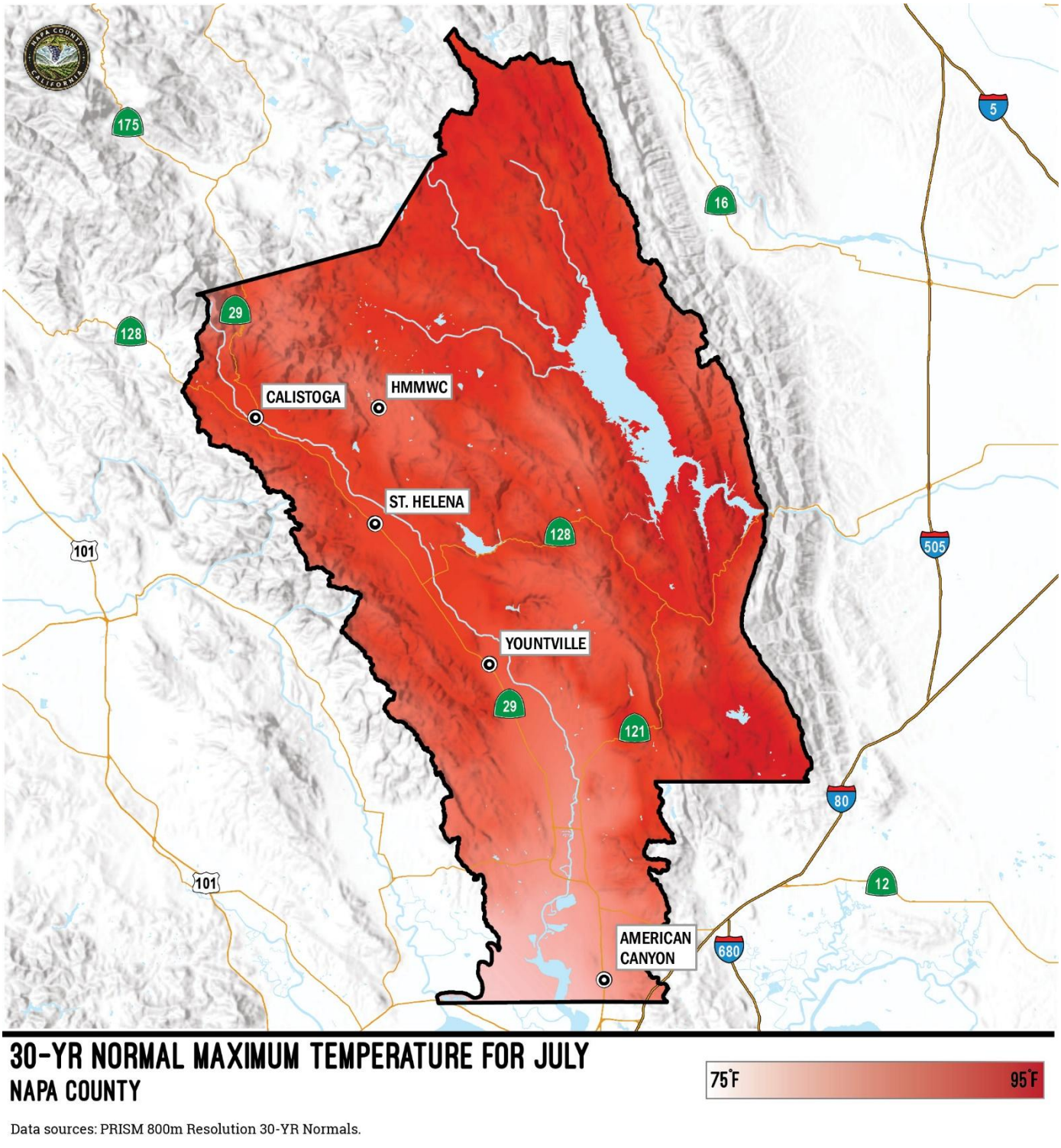


Figure 3-44: Napa County 30-Year Normal Maximum Temperature for July

3.3.8.6 Severity

Extreme heat kills by taxing the human body beyond its abilities. In a normal year, about 175 Americans succumb to the demands of heat during the summertime. In the 40-year period from 1936 through 1975, nearly 20,000 people were killed in the United States by the effects of heat and solar radiation. In the heat wave of 1980, more than 1,250 people died. (Disasters Are Us, n.d.) Although these events preceded the boom in residential use of air conditioning nationwide, they demonstrate the severity of extreme heat events when people are left without such protections.

Because the human body is capable of acclimating to local climate conditions, there is no single temperature that serves as a definition of extreme heat. This MJHMP uses the definitions set forth by Cal-Adapt (a data download interface provided by the CEC) for extreme heat events, warm nights, and heat waves, with descriptions and threshold values for Napa County outlined in Table 3-57.

Heat Stress Indicators

Humidity plays a large role in determining how hot conditions actually feel. As the air becomes saturated with moisture, the body loses its ability to shed excess heat through sweating. Warm and humid nights contributed to the fatal nature of the July 2006 heatwave in California. (Hulley, Dousset, & Kahn, 2020)

A heat index describes what temperatures feel like to the human body, accounting for both air temperature and humidity. Figure 3-45 shows the Nation Weather Service's (NWS) heat index classifications and calculation chart based on temperatures at different relative humidities, which are used to forecast the heat watches, warnings, and advisories for local areas described in Table 3-60. The heat index was developed for shaded, light wind conditions; it does not capture hazards from exposure to direct sunlight and hot, dry winds, which may be relevant to populations who exercise or perform physical work in direct sun.

The wet bulb global temperature (WBGT) is an indicator of heat stress for active populations that incorporates temperature, humidity, wind, solar radiation, and other weather parameters. (National Weather Service, 2022) Different heat stress indicators are useful for different applications; the WBGT may be more useful for workplace safety or athletic programs, but the heat index can help reveal community-wide vulnerabilities for inactive populations who are able to seek shade during an extreme heat event.

HEAT INDEX CLASSIFICATION

Caution	80°F - 90°F	Fatigue possible with prolonged exposure and/or physical activity
Extreme Caution	90°F - 103°F	Heat stroke, heat cramps, or heat exhaustion possible with prolonged exposure and/or physical activity
Danger	103°F - 124°F	Heat cramps or heat exhaustion likely, and heat stroke possible with prolonged exposure and/or physical activity
Extreme Danger	125°F or higher	Heat stroke highly likely

National Weather Service Heat Index Classifications. National Oceanic and Atmospheric Administration. Values are for shaded areas, sunny locations can increase value by up to 15°F. The **heat index** is what temperature the human body feels in relation to both humidity and temperature.

HEAT INDEX CALCULATION CHART

Relative Humidity (%) \ Temperature (°F)	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	128	136					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

Source: National Weather Service.

Figure 3-45: Head Index Classification and Calculation

Health Impacts

The human body possesses a variety of adaptations to regulate internal temperature under warm conditions, including sweat glands, exposed skin, and walking on two legs. Above-average temperatures, even outside summer months, compromise the body's ability to internally regulate, leading to excess illness and death. Heat-related health impacts include exacerbating existing medical conditions and acute illness related to direct exposure to high temperatures, such as heat cramps, heat exhaustion, and heat stroke, as described in Table 3-58.

Table 3-58: Heat-Related Illnesses

Heat-Related Illness	Symptoms
Heat Cramps	▪ Symptoms include muscular pains and spasms, usually in the stomach, arms, and leg muscles. ▪ Usually results from heavy exertion, such as exercising during extreme heat. ▪ Although heat cramps are the least severe of all heat-related problems, they are usually the first signal that the body is having trouble coping with hot temperatures.
Heat Exhaustion	▪ Heavy sweating ▪ Pale, clammy, moist skin ▪ Extreme weakness or fatigue ▪ Muscle cramps ▪ Headaches ▪ Dizziness or confusion ▪ Nausea or vomiting ▪ Fast and shallow breathing ▪ Fainting
Heat Stroke	▪ Flushed, hot, dry skin (no sweating) ▪ Body temperature above 103˚F ▪ Confusion or dizziness ▪ Throbbing headache ▪ Rapid or strong pulse ▪ Unconsciousness Heat stroke is the most severe heat-related illness and occurs when a person's temperature control system, which produces sweat, stops working. Heat stroke may lead to brain damage and death.

Many chronic medical conditions are exacerbated by high temperatures, including cardiovascular and respiratory diseases. Extreme heat days are associated with increases in hospital visits and emergency medical service (EMS) calls for heat-related illnesses along with cardiovascular and respiratory complications, renal failure, electrolyte imbalance, kidney stones, preterm birth, and negative fetal health outcomes. (Ebi, et al., 2018) Warm nighttime temperatures may also reduce the body's ability to recover from extreme heat during the day, especially for people with underlying chronic ischemic conditions such as coronary heart disease. (Sarofim, et al., 2016) The annual number of extreme heat days and warm nights the Napa County region is expected to increase over the next century, driven by climate change, which is discussed further in its hazard profile (Section 3.3.9).

3.3.8.7 Warning Time

Meteorologists can often predict the likelihood of an extreme heat event up to 10 days in advance. This can give several days of warning time. However, meteorologists cannot predict the exact time of onset or severity of the event and some may come on more quickly or severely than expected.

Since 2014, the National Weather Service (NWS) has issued heat-related alerts for local areas based on its HeatRisk index that are then propagated in California by Cal OES. The NWS's HeatRisk index assigns a numerical value ranging from 0 to 4 based on average historical conditions for a given local area and time of year and also accounts for the vulnerability of specific groups such as outdoor workers, children, and the elderly (Table 3-59). This tool accounts for differences in local adaptations to climate identifies unusual heat

(defined as the warmest 5% of temperatures) specifically for a particular date and location, resulting in daily thresholds that are unique for each location and date. For example, the index recognizes that residents of Florida are better prepared for 90°F weather than residents of Alaska.

Each HeatRisk level is accompanied by recommendations for heat protections and serves as a useful tool for planning for upcoming heat events. Based on the index and other forecasting tools, NWS issues watches, advisories, and warnings for heat events, depending on confidence and imminence factors (Table 3-60).

Table 3-59: NWS HeatRisk Categories and Related Impacts

Category	Risk	Heat-Related Impacts
0 Green	**Little / None**	Little to no risk from expected heat.
1 Yellow	**Minor**	Primarily affects those who are extremely sensitive to heat and without cooling/hydration.
2 Orange	**Moderate**	Affects those who are sensitive to heat, especially those without cooling/hydration, and some health systems and industries.
3 Red	**Major**	Affects anyone without cooling/hydration as well as health systems and industries.
4 Magenta	**Extreme**	Rare and/or long-duration extreme heat with no overnight relief affecting anyone without cooling/hydration as well as health systems, industries, and infrastructure.

Source: National Weather Service

Table 3-60: NWS Heat Forecast Terms and Definition

Alert Type	Criteria	HeatRisk Category
Heat Advisory	Issued for dangerous heat conditions not expected to reach warning criteria. Consider postponing or rescheduling outdoor activities. Stay hydrated and find a cool indoor place during the heat of the day.	**2-3** (Orange to Red)
Excessive Heat Watch	Issued when an extreme heat event is possible but its occurrence and timing are still uncertain. Reschedule outdoor activities in the coming days. Make sure that children, elderly, and pets have a place to cool off during the heat.	**3-4** (Red to Magenta)
Excessive Heat Warning	Issued when extremely dangerous heat conditions are expected or occurring. Avoid heavy activity and direct sunlight. Stay hydrated, find a cool indoor place, and check on children, elderly, and pets.	**3-4** (Red to Magenta)

Source: National Weather Service

3.3.8.8 Extreme Heat Vulnerability Analysis

Extreme heat is an emerging and increasingly significant hazard in Napa County, with the potential to impact public health, infrastructure systems, and economic activity. This vulnerability analysis evaluates the exposure and sensitivity of key assets—including population, property, and critical facilities and infrastructure—to extreme heat conditions. The analysis considers both current conditions and projected climate trends, recognizing that rising temperatures, longer heatwaves, and warmer nighttime conditions will intensify risks over time. Understanding how extreme heat affects different segments of the community and built environment is essential for identifying vulnerabilities, prioritizing mitigation actions, and enhancing overall resilience.

3.3.8.8.1 Population

Napa County's population is highly susceptible to extreme heat. Health impacts of extreme heat are not distributed equally, with certain groups facing compounding vulnerability to extreme heat, particularly populations such as older adults, young children, individuals experiencing homelessness, and individuals with underlying chronic diseases. Areas with higher populations of seniors and low-income households, and low cover of trees and green surfaces, face the highest exposure to extreme heat hazards. The most sensitive populations in the county reside in the areas surrounding the City of American Canyon and the City of Napa.

3.3.8.8.2 Property

Extreme heat days in Napa County are expected to reach temperatures that would affect most buildings, including older structures that are generally more vulnerable to the impacts of extreme heat. High temperatures can cause roofs and other structural components to expand and warp, weakening the structural integrity of buildings. Aging pipes are vulnerable to leaks or breakage during periods of increased water demand, as residents seek relief from heat by turning on sprinklers, filling pools, or using hoses.

In addition, agricultural crops may suffer during extreme heat events. This can result in reduced crop yields and cause a reduction in the nutritious value of the crops for the consumer. Heat events also negatively affect livestock, causing reductions in fertility, less resilience to disease, and lower production of goods such as eggs and milk. (NOAA, 2023) In Napa County, these impacts on the agricultural sector would have rippling effects from farm and food industry workers to the other sectors that support them.

3.3.8.8.3 Critical Facilities & Infrastructure

Many types of infrastructure are impacted by prolonged exposure to extreme heat including rails, roads, and aviation. High temperatures can lead to deterioration of pavement and expansion or buckling of sidewalks and roads. (Federal Highway Administration, 2013) Railroad tracks are at risk of buckling at temperatures exceeding 100˚F. (Union of Concerned Scientists, 2018) In Napa County, it is likely that temperatures will get

high enough to cause direct damage to most types of critical facilities or infrastructure, which may result in impacts to structural integrity, system operations, and public services.

The most common problems associated with extreme heat are loss of utilities. Public safety power shutoffs during high heat conditions combined with fire weather or increased demand on the grid from cooling systems can cause brownouts or blackouts that leave vulnerable populations without electricity and expose them heat-related illness. While those in poverty, children, and the elderly are the most at risk, no one is completely safe without the ability to stay cool. And without power, other utility systems that lack backup generation may not function. Energy demand and grid vulnerability is expected to increase across the nation and in California. (California Energy Comission, 2018) Increased energy usage and higher demand peaks can stress electricity grid system, while extreme temperatures can decrease the safe operating capacity of hardware. (US Department of Energy, 2019, p. 12)

Extreme heat events are also increasingly disruptive to educational opportunities for children. Research has shown that up to 41% of schools in the country may not have proper cooling or ventilation systems, which have already caused early school dismissals and cancellations. (NOAA, 2023) Early class dismissals or cancellations due to heat put more strain on worker attendance and productivity for some parents as they scramble to find childcare, and these conditions expose children to heat-related health risks as well as lower test scores in some instances.

3.3.8.9 Development Trends

Although population growth and new development continues to occur across the county, energy efficiency and worker safety regulations help address heat-related hazards by limiting exposure, and local services include providing community cooling centers. The county's General Plan also establishes objectives and policies aimed at protecting its communities from the impacts of extreme heat. In particular, the General Plan calls for several strategies to mitigate extreme heat hazards through activities such as urban forestry and greening to reduce urban heat islands.

California residential and building codes require residential units to have heating, but this requirement does not exist for air conditioning. The California Building Standards Code, which has been adopted by the county and other participating municipalities, includes provisions for energy efficiency that may help increase power grid resilience to peak demand during heat events.

3.3.8.10 Climate Change Impacts

Extreme heat is an emerging hazard in Napa County and is projected to become more frequent and severe as climate change accelerates. Rising temperatures, longer heatwaves, and warmer nights will increase health and safety risks, particularly in inland and mountain areas that have historically had mild microclimates and are less prepared with cooling strategies or resilient infrastructure. Extreme heat often compounds other hazards such as drought and wildfire smoke, amplifying risks for both human health and critical infrastructure.

Direct Impacts

Extreme heat threatens public health, energy reliability, and continuity of essential services. Increased electricity demand for cooling raises the risk of brownouts or blackouts, which can disrupt public safety operations and limit access to indoor cooling. Heat also stresses critical systems such as water supply, stormwater infrastructure, and transportation networks, with prolonged events creating additional maintenance and operational challenges.

Secondary Hazards

Extreme heat often coincides with drought, wildfire, and poor air quality, creating cascading risks. Farmworkers and outdoor laborers face simultaneous exposure to heat and wildfire smoke, heightening risks of illness, dehydration, and long-term respiratory damage. Extended periods of high temperatures also reduce nighttime cooling, placing chronic stress on vulnerable populations and increasing the likelihood of medical emergencies.

Public Health and Social Impacts

Vulnerable populations including seniors, individuals with underlying health conditions, people experiencing homelessness, low-income households, renters, and non-English speakers face the greatest risks during extreme heat events. Many households lack air conditioning, financial means to absorb higher energy costs, or reliable access to cooling centers. The County does not yet have a fully developed strategy for cooling centers or resilience hubs, and existing facilities often lack backup power, air filtration, or accessibility upgrades. As a result, those most at risk may be unable to access safe, reliable shelter during extended heat events.

The mitigation strategy addresses extreme heat by expanding access to cooling centers, improving outreach to vulnerable populations in multiple languages, strengthening monitoring of heat-related illness, and investing in resilience upgrades for public facilities. These actions aim to reduce inequities and enhance the County's overall preparedness for a warming climate.

3.3.8.11 Extreme Heat Hazard Problem Statements

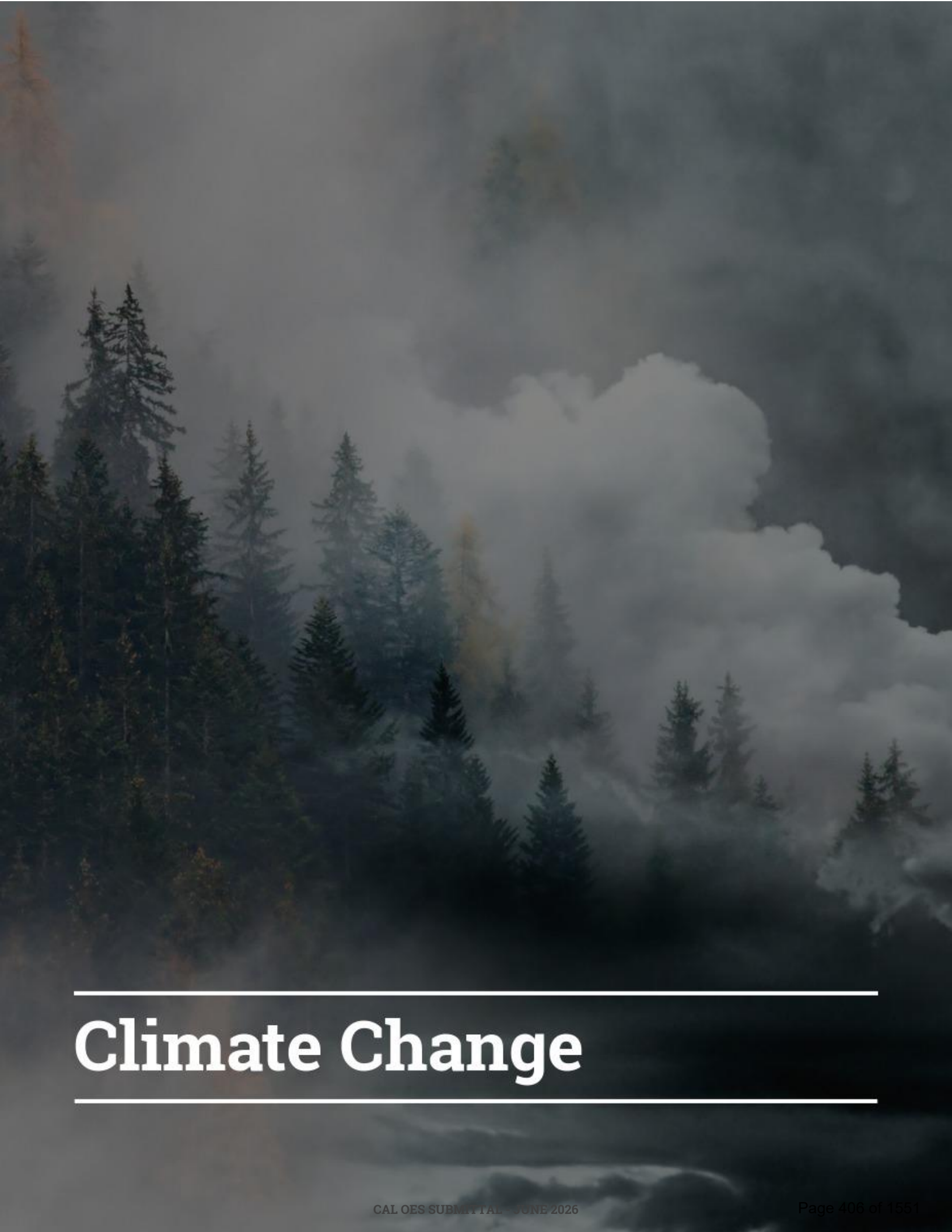
As part of the mitigation action identification process, the Napa County Planning Team developed areas of concern (i.e., problem statements) that summarize the county's most pressing extreme heat-related vulnerabilities and challenges. The problem statements were developed based on the updated risk assessment and vulnerability analysis contained herein, as well as the team's local knowledge and experience and community input. The problem statements address a broad spectrum of concerns, from direct impacts on residents and vulnerable populations to threats to critical infrastructure and long-term recovery.

These problem statements are not intended to be all-encompassing or to describe each and every issue associated with extreme heat. Instead, they highlight the most urgent concerns that can be addressed

within the scope of this MJHMP. Each statement will be linked to at least one mitigation action, ensuring that identified needs are met with specific, measurable, and equitable solutions. Table 3-61 presents the extreme heat problem statements for Napa County, along with their associated areas of concern and reference numbers for cross-linking to the mitigation actions in in Table 4-3 and Table 4-4.

Table 3-61: Napa County Extreme Heat Hazard Problem Statements

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-CC-NCo-3	High Heat	Victim	**Napa County**	Extreme heat events pose risks to seniors, unhoused people, and other vulnerable populations and to the County's network of cooling centers that serve them during heat waves.	ma-CC-NCo-15, ma-AH-NCo-4, ma-AH-NCo-6, ma-CC-NCo-16
ps-CC-NCo-9	High Heat	Threat	**Napa County**	Increases in temperature, along with the frequency of extreme heat events and heat waves, can adversely affect the agriculture industry, which is a large driver of the County's economy.	ma-CC-NCo-17, ma-AG-NCo-1, ma-CC-NCo-16
ps-CC-NCo-10	High Heat	Impact	**Napa County**	Extreme heat events can cause power outages and damage to energy systems from increased consumer demand and direct impacts to facilities and infrastructure.	ma-CC-NCo-16, ma-AH-NCo-4, ma-AH-NCo-6, ma-DR-NCo-26
ps-HH-NCo-390	High Heat	Victim	**Napa County**	Farmworkers and other outdoor workers are highly exposed to extreme heat, often compounded by drought and wildfire smoke, which can cause illness and exacerbate underlying respiratory and other health conditions, with disproportionate impacts on already vulnerable populations.	ma-AH-NCo-6, ma-CC-NCo-15, ma-AG-NCo-1, ma-CC-NCo-16



Climate Change

3.3.9 Climate Change Hazard Profile



Climate change is increasing the frequency, severity, and unpredictability of these disasters, intensifying long standing risks and expanding their reach into areas and populations that have not been as exposed in the past.

Throughout this plan, each hazard section includes an assessment of how climate change is expected to alter frequency, severity, and cascading impacts. This integrated approach ensures that mitigation strategies are informed by the best available climate science and address the ways climate change is making existing hazards more damaging and harder to manage. This stand-alone section on climate change focuses specifically on agricultural impacts and sea level rise, subhazards that requires unique attention due to their long-term and, in some cases, irreversible impacts.

Unlike other hazards that can ebb and flow with weather cycles, sea level rise will steadily increase exposure for coastal communities, infrastructure, and ecosystems. Rising seas compound flood risk, accelerate coastal erosion, and threaten the stability of underground utilities, transportation corridors, and low-lying neighborhoods. Vulnerable populations, including low-income residents and those living near the shoreline, will face disproportionate impacts from displacement, loss of access, and reduced public safety.

It is important to emphasize that this MJHMP is not a climate change plan. Broader strategies to reduce greenhouse gas emissions and plan for long-term climate adaptation are addressed in the Napa Regional Climate Action and Adaptation Plan (RCAAP). Instead, this plan highlights how climate change drives hazard risk, while treating sea level rise as a stand-alone hazard due to its unique and compounding challenges.

Climate Projections: Representative Concentration Pathways (RCP)

Climate change projections must account for many different variables besides greenhouse gas emissions (GHG), including changes in energy generation and land use, global and regional economic circumstances and population growth. So that research among different groups is complementary and comparable, a standard set of scenarios was developed to ensure that starting conditions, historical data, and projections are employed consistently.

These scenarios are referred to as Representative Concentration Pathways (RCP), which show the time-dependent trajectories of GHG concentrations in the atmosphere and corresponding global temperature outcomes. A range of RCPs has been developed that reflect the potential timing of global action or inaction in decreasing GHGs, resulting in a lower or higher global average temperature.

Location is a key factor in determining the range of impacts from climate change. In California, the University of California Berkeley Geospatial Innovation Facility developed a platform called Cal-Adapt funded by the California Energy Commission (CEC). This platform provides tools and data on climate change across the state, including for Napa County, from global scale models that have been localized (downscaled) to 3.7-mile by 3.7-mile grids.

Cal-Adapt data combined with information from the California Fourth Climate Change Assessment was used to model future changes in specific types of hazards consistent with the information presented in this section; projections are outlined by two separate RCPs:

- **RCP 4.5** is a medium emissions scenario where global emissions peak by the year 2040 and then decline.
- **RCP 8.5** is a high emissions scenario in which global emissions continue to rise through the end of the twenty-first century.

3.3.9.1 Secondary Hazards

Secondary hazards of climate change include flood, severe weather, drought, wildfire, sea level rise, extreme heat, and heavy rain events. Climate change will most likely increase the frequency at which severe weather events occur. Secondary hazards of climate change that will have the greatest impact on Napa County include flood, drought, wildfire, extreme heat and severe weather and, as such, are discussed in other hazard profiles.

3.3.9.2 Subhazards

For Napa County, there are specific subhazards of climate change that are more relevant to the planning area than others. This includes sea level rise and agricultural impacts as part of this section. These subhazards reflect the county's unique geographic and economic conditions, including its proximity to San Pablo Bay and its reliance on a highly productive agricultural economy. Climate-driven changes such as rising water levels and increased temperature variability have the potential to affect both natural systems and economic stability. As a result, these subhazards are critical considerations for long-term resilience and adaptation planning.

Sea Level Rise

Sea level rise is the gradual increase in ocean water levels driven primarily by global climate change, including the thermal expansion of warming ocean waters and the melting of glaciers and polar ice sheets. While global sea levels rose by less than one foot over the past century, the rate of rise is expected to accelerate throughout the 21st century as greenhouse gas concentrations continue to increase.

According to the State of California Sea Level Rise Guidance: 2024 Science and Policy Update, statewide average sea levels are projected to rise approximately 0.8 feet by 2050 and between 1.6 and 3.1 feet in the next century, depending on future emissions and risk scenarios. In Napa County, sea level is projected to rise as much as six feet by 2100. These projections are based on the best available science and incorporate both global trends and regional factors specific to the California coast.

Although Napa County is not directly exposed to open ocean conditions, sea level rise influences local conditions through San Pablo Bay, affecting tidal dynamics, groundwater levels, and low-lying shoreline

areas. Projected impacts include increased tidal inundation, elevated groundwater levels, and greater extent of flooding during storm events, particularly when combined with atmospheric rivers or high tide conditions. Sea level rise may also contribute to erosion of shoreline areas and loss of wetlands, which serve as natural buffers against flooding.

Sea level rise along the California coast varies due to regional influences such as ocean circulation patterns, atmospheric conditions, and local geology. These factors affect how global sea level trends are expressed locally and are important considerations for long-term planning. As sea levels continue to rise, even modest increases can significantly expand the extent and frequency of flooding in vulnerable areas.

Areas potentially exposed to sea level rise and related impacts in Napa County are further described in the Location subsection and depicted in Figure 3-46.

Agricultural Impacts

Agricultural impacts are a key subhazard of climate change in Napa County, where the local economy and land use patterns are strongly tied to winegrape production and other agricultural activities. Climate change is expected to affect agriculture through a combination of rising temperatures, changing precipitation patterns, increased frequency of extreme weather events, and shifting ecological conditions.

Temperature increases and more frequent extreme heat events can directly affect crop growth, reduce yields, and alter growing cycles. Changes in precipitation patterns, including prolonged drought and more variable rainfall, can reduce water availability for irrigation and impact soil moisture conditions. In addition, extreme weather events such as heat waves, heavy rainfall, and unseasonal frost events can cause acute damage to crops and infrastructure. (See Severe Weather and Drought Hazard Profiles for additional detail.)

Agricultural Pests and Pathogens

California farmers contend with a wide range of crop-damaging pests and pathogens. Continued climate change is likely to alter the abundance and types of many pests, lengthen pests' breeding season, and increase pathogen growth rates. For example, the pink bollworm, a common pest of cotton crops, is currently a problem only in southern desert valleys because it cannot survive winter frosts elsewhere in the state. However, if winter temperatures rise 3 to 4.5 degrees Fahrenheit (°F), the pink bollworm's range would likely expand northward, which could lead to substantial economic and ecological consequences for the state.

According to a 2012 California Energy Commission report "Vulnerability and Adaptation to Climate Change in California Agriculture", change in climate can directly impact crop growth through new temperature patterns and northward shifts of pests and disease. Additionally, longer growing seasons will possibly enable pest species to complete more reproductive cycles, which can increase severity of infestations.

Temperature is not the only climatic influence on pests. For example, some insects are unable to cope in extreme drought, while others cannot survive in extremely wet conditions. Furthermore, while warming speeds up the lifecycles of many insects, suggesting that pest problems could increase. Some insects may

grow more slowly as elevated carbon dioxide levels decrease the protein content of the leaves on which they feed. (CalOES, 2018)

California agriculture and forests are at risk from pests and diseases that, under certain conditions, can cause severe economic, environmental, or physical harm. Table 3-62 identifies pests and diseases of concern. Agricultural disasters could also occur due to severe weather such as severe heat and freeze events. Those hazards are covered in under Severe Weather, Section 3.3.5. Drought, another potential agricultural hazard, is discussed in Section 3.3.6.

Agriculture pests and diseases can result in economic and human health disasters. For example, insect pest hazards can have a major economic impact on farmers, farm workers, packers, and shippers of agricultural products. They can also cause significant increases in food prices for consumers due to shortages. In addition, insect pests and diseases such as bark beetles, Sudden Oak Death, and Pitch Canker in trees can destroy large expanses of forest and woodland, increasing the fuel load and contributing to greater fire risk. (CalOES, 2018)

Table 3-62: California Agriculture Pests and Diseases

Dangerous To	Pests and Diseases
Crops and other plants	Asian citrus psyllid/-Huanglong Bing (HLB) disease, Caribbean fruit fly, glassy-winged sharp shooter/Pierce's Disease, European Grapevine Moth, Guava fruit fly, Gypsy moth, Japanese beetle, Mediterranean fruit fly, Melon fruit fly, Mexican fruit fly, Olive fruit fly, oriental fruit fly, bark beetle
Trees	Polyphagous shot hole borers, Bark beetle, Gold spotted oak borer, Sudden oak death (*Phythothora ramorum*), Pitch canker, Emerald ash borer, Asian longhorn beetle
Livestock or poultry	Foot and Mouth Disease, Highly Pathogenic Avian Influenzas (H5 & H7), Exotic Newcastle Disease
Humans	Africanized honeybee, mosquito
All	Red imported fire ant, Bovine Spongeform Encephalopathy, zoonotic animal viruses

Sources: cdfa.ca.gov/PHPPS/pdep/target_pests.html and cdfa.ca.gov/ahfss/Animal_Health/pdfs/CA_Reportable_Disease_List_Poster.pdf

3.3.9.3 Policies, Plans & Regulatory Environment

Successful efforts to address the challenges of climate change begin at the local level and include the implementation of environmentally sustainable practices designed to meet present and future energy needs.

State Regulatory Environment

California Green Building Standards

The County has adopted the California Green Building Standards, also known as CALGreen Code. CALGreen Code establishes regulations for green building, nonresidential and residential buildings. Topics covered in the regulations include planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency and environmental quality. The code also includes voluntary measures for residential, nonresidential and health facilities.

California Sustainable Communities and Climate Protection Act

The Sustainable Communities and Climate Protection Act of 2008 (Sustainable Communities Act, SB 375, Chapter 728, Statutes of 2008) looks to reduce GHG emissions through coordinated transportation and land use planning with the goal of more sustainable communities. Regional targets are established for GHG emissions reductions from passenger vehicle use by the sustainable communities strategy (SCS) established by each metropolitan planning organization (MPO). The SCS is an integral part of regional transportation plans (RTP) and contains land use, housing, and transportation strategies to meet GHG reductions targets.

SB 375 also supports state requirements that a city or county general plan contains a safety element in addition to a hazard mitigation plan. AB 2140 also requires a vulnerability assessment, adaptation goals, policies and objectives, and a set of feasible implementation measures.

California Adaptation Planning Guide (APG)

California has been taking action to address climate change for over 20 years, focusing on both greenhouse gas emissions reduction and adaptation. The California APG provides guidance and support for communities addressing the unavoidable consequences of climate change.

California Coastal Commission Sea Level Rise Guidance

The California Coastal Commission Sea Level Rise Guidance provides guidance for addressing sea level rise in coastal programs and development permits. The guidance includes interpretive guidelines for LCPs and is based on updated scientific knowledge of statewide sea level rise and coastal hazards. It offers practical approaches for state agencies, local governments, and communities to enhance coastal resilience and

protect vital ecosystems. The guidance emphasizes the importance of sustainable adaptation strategies to manage the impacts of rising sea levels.

California Department of Food and Agriculture (CDFA)

The California Department of Food and Agriculture (CDFA) has extensive responsibilities for protecting the food supply, including protecting and responding to the invasion of plant diseases and pests. CDFA administers the statewide programs to address crop health and pest prevention and administers grant programs regarding the same. This includes the statewide exterior exclusion program, border protection stations, pest detection and emergency projects, trapping, interior exclusion quarantine programs, and Integrated Pest Control weed eradication and biological control programs.

The CDFA also administers programs to address the prevention, detection, immediate containment, and eradication of emergency animal diseases. Some animal diseases have human health implications, and all affect production and marketability of livestock and poultry. Therefore, addressing animal disease contributes to a solid foundation for economic prosperity while decreasing human health. Activities to achieve these goals include outreach and educational services, routine disease surveillance and disease investigations to detect the introduction and spread of injurious animal pests and diseases, and, when necessary, implementation of animal quarantine to control the spread of disease.

The California Conservation Corps assists in mitigating the impacts of insect pests by providing human resources to assist in state and local eradication efforts, including surveying private yards and business landscapes to detect the Glassy Winged Sharpshooter, striping citrus fruit infected by the Mexican Fruitfly, and helping eradicate the Exotic Newcastle Disease by cleaning and disinfecting backyards.

California county-level agriculture commissioners are charged with the protection of California agriculture, the environment, and the public's health and safety. These goals are accomplished through the management of programs that combine public outreach, industry, education, and enforcement actions. County-level agricultural commissioners carry out the following programs to accomplish these aims: Pest Exclusion, Pest Detection, Pest Eradication, Pest Management, Pesticide Enforcement, Seed Certification, Nursery Inspection, Fruits, Nuts and Vegetable Standardization, Egg Inspection, Apiary Inspection, and Crop Statistics.

CDFA licenses the agricultural commissioners and maintains a liaison office to ensure close coordination with the commissioners individually and as a group. (CalOES, 2018)

Invasive Species Council of California

The Invasive Species Council of California (ISCC) was established in 2009 to provide leadership and authority in state government regarding invasive species, with its primary goals being to guide efforts to keep invasive species out of the state and to eradicate incipient populations of undesirable species. ISCC is an inter-agency council chaired by the Secretary of the California Department of Food and Agriculture with members from the California Natural Resources Agency, the California Environmental Protection Agency,

the California Business, Transportation and Housing Agency, the California Health and Human Services Agency, and Cal OES. The ISCC has appointed a California Invasive Species Advisory Committee (CISAC) primarily tasked with making recommendations to develop and prioritize an Invasive Species Action Plan. For more information regarding the ISCC and the CISAC, visit: http://www.iscc.ca.gov/.

Local Regulatory Environment

Successful efforts to address the challenges of climate change begin at the local level and include the implementation of environmentally sustainable practices designed to meet present and future energy needs.

Napa County Code

Napa County has designated a Winegrape Pest and Disease Control District, which levies assessments on properties containing one or more planted vineyard acres within the District to assist in the funding of inspection, detection, prevention, and education of Pierce's disease, with the goal of preventing the spread of Pierce's disease by the glassy-winged sharpshooter. (§ 3.54)

Regional Climate Action and Adaptation Plan (RCAAP)

Napa County's climate planning efforts have evolved from the 2018 Climate Action Plan (CAP) into the current Draft Regional Climate Action and Adaptation Plan (RCAAP), which provides a more comprehensive and integrated approach to addressing both greenhouse gas (GHG) reduction and climate resilience. The RCAAP expands upon earlier efforts by incorporating regional coordination, updated climate science, and a stronger focus on adaptation to climate-driven hazards such as drought, extreme heat, wildfire, and severe weather.

Consistent with State climate policy, including targets established under California Senate Bill 32 (SB 32), the RCAAP supports long-term emission reductions while also addressing the increasing impacts of climate change at the local level. The plan establishes a goal of achieving up to 85 percent reduction in GHG emissions by 2045, aligning Napa County with statewide climate objectives and international best practices.

In addition to emissions reduction, the RCAAP emphasizes climate adaptation and resilience strategies, including water conservation, wildfire risk reduction, infrastructure resilience, and protection of vulnerable populations. The plan reflects a shift from a mitigation-only approach to a more holistic framework that integrates land use planning, resource management, and hazard mitigation.

The RCAAP is currently in draft form and, once adopted, will serve as a key policy document guiding Napa County's response to climate change and supporting implementation of strategies identified in the Hazard Mitigation Plan.

Napa County General Plan

The Napa County General Plan establishes a comprehensive policy framework that directly supports the County's Climate Change Profile and associated subhazards, including extreme heat, drought, severe weather, wildfire, sea level rise, and agricultural impacts. The General Plan integrates climate change considerations primarily through the Conservation and Safety Elements, emphasizing greenhouse gas (GHG) reduction, resource conservation, and adaptive management strategies to address evolving climate risks.

- **Goal CON-15** establishes the County's commitment to reducing local GHG emissions that contribute to climate change, aligning with broader State and regional climate objectives. This goal supports long-term mitigation of climate-driven hazards such as extreme heat, drought, and wildfire by addressing underlying emissions sources.
- **Policy CON-65** provides a comprehensive framework for reducing and offsetting GHG emissions while enhancing carbon sequestration across natural, agricultural, and urban systems. Implementation measures—including preservation of agricultural lands, promotion of urban-centered growth, and support for alternative transportation—reduce exposure to climate-related hazards by limiting sprawl, protecting open space, and maintaining ecosystem services that buffer against drought, flooding, and extreme heat. Additionally, requirements to evaluate GHG emissions in discretionary projects ensure that new development considers both mitigation and long-term climate risk.
- **Policy CON-73** establishes an adaptive management approach to climate change by requiring ongoing monitoring of ecological and environmental conditions, including sea level rise, water resources, agriculture, and local microclimates. This policy directly supports the Climate Change Profile by recognizing the dynamic nature of climate hazards and the need to adjust policies and operations over time in response to observed and projected impacts.

Collectively, these goals and policies reinforce the County's ability to address climate-related subhazards by:

- Supporting drought resilience through water resource monitoring and conservation,
- Reducing extreme heat and wildfire risk through land use and vegetation management strategies,
- Addressing sea level rise and flooding through long-term environmental monitoring and planning, and
- Protecting agricultural viability, which is particularly sensitive to climate variability.

The General Plan's emphasis on urban-centered growth, agricultural preservation, and environmental stewardship provides a foundational framework for reducing vulnerability to climate change.

3.3.9.4 Past Events

Climate change is currently affecting California and Napa County, where global mean sea level has risen by as much as seven inches along the coast over the last century, increasing pressure on the state's and county's infrastructure, water supplies, and natural resources. The state and county have seen increased average temperatures, more extreme hot days, fewer cold nights, shifts in the water cycle with less winter precipitation falling as snow, and snowmelt running off sooner in the year (California Natural Resources Agency, 20189).

There is consensus among the world's leading climate change scientists that human-generated emissions of heat-trapping greenhouse gases (GHGs) are the primary cause of the warming trend. Projections indicate that atmospheric concentrations of GHGs will continue to increase throughout this century. Data describing atmospheric GHG concentrations over the past 800,000 years demonstrates that concentrations of carbon dioxide (CO2), the primary anthropogenic GHG, have increased substantially since pre-industrial times, driven largely by economic and population growth, and are now higher than ever. This has led to atmospheric concentrations of carbon dioxide, methane and nitrous oxide that are unprecedented in at least the last 800,000 years. Their effects, together with those of other anthropogenic drivers, have been detected throughout the climate system and are extremely likely to have been the dominant cause of the observed warming since the mid-20th century. (IPCC,2014).

The Intergovernmental Panel on Climate Change (IPCC) described potential global emission scenarios for the coming century. The scenarios vary from a best-case, characterized by low population growth, clean technologies, and low GHG emissions; to a worst-case, wherein high population and fossil-fuel dependence result in extreme levels of GHG emissions. Continued emission of greenhouse gases will cause further warming and long-lasting changes in all components of the climate system, increasing the likelihood of severe, pervasive, and irreversible impacts for people and ecosystems. Limiting climate change would require substantial and sustained reductions in greenhouse gas emissions which, together with adaptation, can limit climate change risks.

Many aspects of climate change and associated impacts will continue for centuries, even if anthropogenic emissions of greenhouse gases are stopped. The risks of abrupt or irreversible changes increase as the magnitude of the warming increases (IPCC 2014) Our natural, economic, and cultural systems are closely tied to the climate. Significant changes in the climate will impact the way people live: the food we grow, our health and safety, the availability of water, our economy, wildlife and vegetation, and many other aspects of our lives.

Sea Level Rise

Historic records from the San Francisco tidal gage, CA Station ID: 9414290, show that the sea level in the San Francisco Bay has risen eight inches from 1897 to 2006. Similarly, water level measurements from the tidal gage at Port Chicago, CA Station ID: 9415144, show an increase in mean sea level of 2.08 millimeters a year, which is equivalent to a change of 8.6 inches in 100 years.

Agricultural Impacts

Napa County's agricultural sector, particularly its globally significant viticulture industry, has experienced a range of hazard events that are increasingly linked to climate variability and long-term climate change. While traditional agricultural disasters such as pest infestations have occurred historically, recent decades have seen a shift toward climate-driven impacts, including extreme heat, prolonged drought, and wildfire-related effects.

Extended drought conditions, most notably during the 2012–2016 statewide drought and subsequent dry periods, significantly stressed vineyard operations and reduced water availability for both irrigation and groundwater recharge. These conditions led to increased reliance on groundwater, heightened concerns regarding basin sustainability, and impacts to crop yields and vine health.

Extreme heat events have also caused measurable agricultural losses. Heatwaves in 2017, 2020, and 2022 resulted in sunburn damage to grape clusters, reduced yields, and altered harvest timing. Elevated nighttime temperatures further affected grape quality by disrupting ripening cycles, with implications for wine production and market value.

Wildfire events, including the 2017 North Bay Fires and the 2020 LNU Lightning Complex, had substantial indirect impacts on agriculture. In addition to direct damage to vineyard infrastructure, smoke exposure resulted in widespread "smoke taint," rendering some grape harvests unusable and causing significant economic losses. These events were exacerbated by prolonged drought and extreme heat, which contributed to fuel dryness and fire intensity.

Climate-related shifts have also influenced pest and disease dynamics. Warmer temperatures and changing precipitation patterns can expand the range and lifecycle of agricultural pests and pathogens, increasing management costs and risks to crop productivity.

Collectively, these events demonstrate that agricultural impacts in Napa County are increasingly driven by the interaction of multiple climate-related hazards. The growing frequency and severity of drought, heat, and wildfire events underscore the need for continued adaptation strategies to protect agricultural resources, sustain economic productivity, and maintain the long-term viability of the County's agricultural sector.

3.3.9.5 Location

The effects of climate change are not limited by geographical borders. Napa County, the State of California, the United States, and the rest of the world are all at risk of climate change. As such, the entire county is at risk to the effects of climate change.

Sea Level Rise

Sea level rise impacts in Napa County are geographically concentrated in the southern portion of the county, particularly in low-lying areas adjacent to San Pablo Bay and along the lower reaches of the Napa River and its tidal tributaries. As shown in Figure 3-46, the areas most vulnerable to inundation are located in and around American Canyon and the southern Napa Valley, where elevations are lowest and tidal influence is greatest.

While sea level rise is often associated with coastal environments, its effects in Napa County extend beyond the immediate shoreline. Rising bay water levels can increase tidal backwater effects, leading to higher water levels further upstream along the Napa River system. In addition, sea level rise may contribute to elevated groundwater levels in low-lying areas, increasing the potential for flooding, reduced drainage capacity, and impacts to infrastructure even outside of directly inundated zones.

The figure indicates that exposure increases progressively under higher sea level rise scenarios, with areas currently experiencing minimal or no inundation becoming susceptible under intermediate and extreme projections. These impacts are most pronounced in flat, low-elevation with limited natural drainage and in areas with existing flood risk.

Although the northern and upland portions of Napa County are not directly exposed to coastal inundation, they may still experience indirect impacts, including changes in watershed dynamics, downstream flooding conditions, and ecological shifts. Overall, sea level rise in Napa County is a spatially concentrated hazard with expanding inland influence over time, primarily affecting southern and tidally influenced areas.

Agricultural Impacts

Napa County's Agricultural Preserve, established in 1968, plays a central role in shaping the County's land use patterns and exposure to climate-related hazards. The Preserve encompasses much of the valley floor in unincorporated areas between the City of Napa and Calistoga and was the first program of its kind in the nation. Initially protecting approximately 26,000 acres of farmland, the Agricultural Preserve has expanded to over 31,600 acres, with no lands removed since its establishment.

More broadly, Napa County spans over 500,000 acres, of which approximately 90 percent is designated as Agriculture, Watershed, and Open Space. Within this area, roughly 46,000 acres are in winegrape production (Napa Dep't of Ag./ Sealer of Weights & Measures, 2017), reflecting the County's strong reliance on agriculture as a primary land use and economic driver. This extensive agricultural landscape, particularly along the valley floor, overlaps with areas potentially influenced by flooding, groundwater changes, and sea level rise, highlighting the importance of considering agricultural resources within the County's climate change vulnerability and adaptation planning.

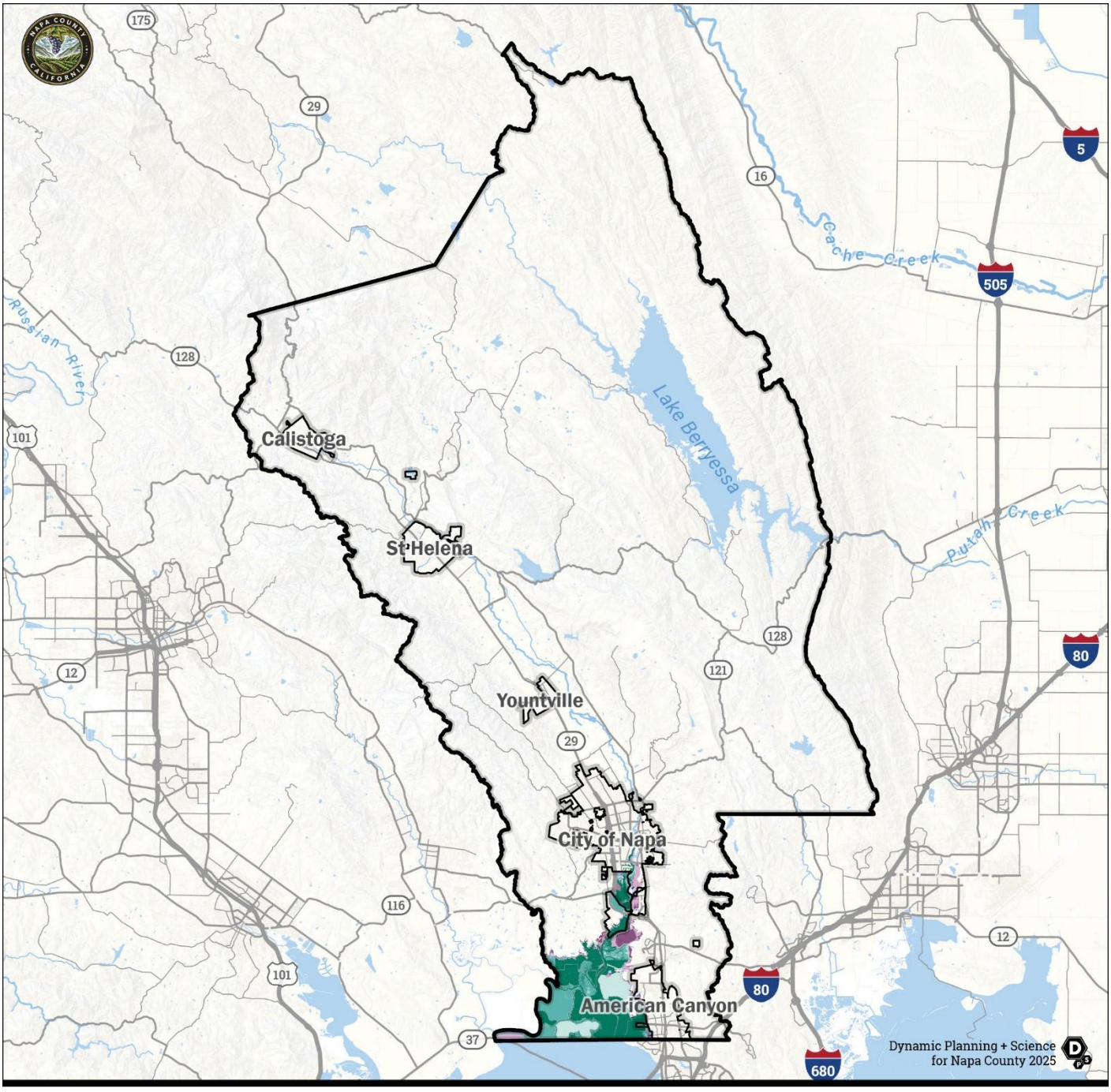


Figure 3-46: Predicted Sea Level Rise Map

3.3.9.6 Frequency & Probability of Future Occurrences

In terms of how likely and quickly impacts will occur, temperature related impacts are the most likely near-term climate change exposure facing the county and should be addressed and prioritized in future adaptation planning efforts. While sea level rise has a high certainty rating and is already occurring, its onset is not expected to occur until closer to the end of the century in terms of changes in areas already vulnerable to flooding or causing permanent inundation in tidally-influenced areas of the county. Addressing increases in flooding and wildfire risk have mid-term onsets and should be prioritized accordingly. (Napa County Climate Action Plan, 2018)

Climate change is one of the few natural hazards where the probability of occurrence is influenced by human action. In addition, unlike earthquake and floods that occur over a finite time period, climate change is an ongoing hazard. The California Climate Adaptation Strategy delineated how climate change may impact and exacerbate natural hazards in the future, including wildfires, extreme heat, floods, drought, and levee failure:

- Climate change is expected to lead to increases in the frequency, intensity, and duration of extreme heat events and heat waves in Napa County and the rest of California, which are likely to increase the risk of mortality and morbidity due to heat-related illness and exacerbation of existing chronic health conditions. Those most at risk and vulnerable to climate-related illness are the elderly, individuals with chronic conditions such as heart and lung disease, diabetes, and mental illnesses, infants, the socially or economically disadvantaged, and those who work outdoors.
- Higher temperatures will melt the Sierra snowpack earlier and drive the snowline higher, resulting in less snowpack to supply water to California users.
- Droughts are likely to become more frequent and persistent in the 21st century.
- Intense rainfall events, periodically ones with larger than historical runoff, will continue to affect California with more frequent and/or more extensive flooding.
- Storms and snowmelt may coincide and produce higher winter runoff from the landward side, while accelerating sea-level rise will produce higher storm surges during coastal storms. Together, these changes will increase the probability of levee and dam failures in the Sacramento-San Joaquin Delta.

Droughts and warmer and more severe weather can be expected to increase wildfire through fuel hazards and ignition risks. These changes can also increase plant moisture stress and insect populations, both of which affect forest health and reduce forest resilience to wildfires. An increase in wildfire intensity and extent will increase public safety risks, property damage, fire suppression and emergency response costs to government, watershed and water quality impacts, vegetation conversions, and habitat fragmentation.

Sea Level Rise

Sea level rise is considered a gradual, long-term hazard that will continue to occur and intensify over time as a result of climate change. Unlike episodic hazards, sea level rise is not defined by discrete events but by

a progressive increase in baseline water levels, which in turn increases the frequency, extent, and duration of coastal and tidal flooding.

According to the State of California Sea Level Rise Guidance: 2024 Science and Policy Update, statewide average sea levels are projected to rise approximately 0.8 feet by 2050 and between 1.6 and 3.1 feet by 2100, with higher-end scenarios possible under extreme conditions. These projections indicate that impacts currently associated with rare storm events will become increasingly common or chronic over time, particularly in low-lying and tidally influenced areas.

In Napa County, the effects of sea level rise will be most evident along San Pablo Bay and the lower Napa River, where rising water levels will increase the likelihood of frequent tidal inundation, backwater flooding, and elevated groundwater conditions. Areas that currently experience flooding only during extreme high tides or storm events may, under future conditions, experience regular or seasonal flooding.

While the onset of sea level rise impacts is gradual, the probability of experiencing its effects increases steadily over time. By mid-century and beyond, sea level rise is expected to transition from an emerging concern to a persistent and recurring condition in vulnerable areas of the County.

Based on current projections and the County's risk assessment framework, the probability of sea level rise impacts occurring in Napa County is considered highly likely (approaching a 100 percent annual probability over the planning horizon). This reflects both the certainty of continued sea level rise and the increasing likelihood that its effects will be experienced on a regular and recurring basis, particularly when combined with storm events and high tide conditions.

Agricultural Impacts

Agricultural impacts associated with climate change are expected to increase in both frequency and severity over time as temperature, precipitation variability, and extreme weather conditions continue to shift. Unlike singular hazard events, agricultural impacts are typically the result of compounding and interacting climate stressors, including extreme heat, prolonged drought, changing precipitation patterns, and wildfire.

In Napa County, climate projections indicate a continued rise in average and extreme temperatures, more frequent and intense heat waves, and greater variability in water availability. These conditions are expected to increase the likelihood of crop stress, reduced yields, altered growing seasons, and increased irrigation demand, particularly for high-value winegrape production. Additionally, warmer conditions may contribute to the expansion of pests and plant diseases, further increasing risks to agricultural productivity.

Drought conditions are also projected to occur more frequently and with greater intensity, reducing surface water availability and increasing reliance on groundwater resources. At the same time, shifts in precipitation patterns, including more intense but less frequent storm events, may reduce effective groundwater recharge and increase runoff, limiting water availability during critical growing periods.

Wildfire risk, which is closely linked to prolonged heat and dry conditions, is also expected to increase. Wildfires can have both direct impacts on agricultural lands and indirect impacts such as smoke exposure, which can damage crops and reduce marketability. These compound hazards further elevate the overall risk to Napa County's agricultural sector.

Based on current climate projections and observed trends, the probability of agricultural impacts related to climate change in Napa County is considered highly likely (approaching a 100 percent annual probability). While the specific nature and severity of impacts may vary from year to year, the underlying drivers—rising temperatures, water stress, and increased hazard interaction—are expected to result in recurring and progressively more significant effects on agricultural production over the planning horizon.

3.3.9.7 Severity

The State of California has been proactively addressing climate change for over two decades through policies and planning frameworks that integrate greenhouse gas (GHG) reduction and climate adaptation strategies. The California Adaptation Planning Guide (APG) provides a standardized, science-based framework for local governments to assess climate vulnerability, evaluate risk, and develop adaptation strategies tailored to regional conditions.

Consistent with the 2020 APG guidance, climate change impacts are evaluated based on exposure, sensitivity, and adaptive capacity, which together determine overall vulnerability and severity. Napa County is located within the San Francisco Bay Area climate region, which is characterized by a Mediterranean climate, strong coastal influences, and complex topography ranging from baylands to inland valleys and mountainous terrain. These geographic characteristics contribute to high variability in climate exposure, resulting in differing hazard intensities across the county.

Within this regional context, Napa County is expected to experience increasing severity of climate-related impacts, particularly those associated with temperature extremes, water availability, and compound hazard events. As identified in the APG and supporting climate assessments, the most relevant climate stressors for Napa County include:

- Increasing average and extreme temperatures
- Changes in precipitation patterns and greater variability
- Increased frequency and intensity of extreme weather events
- Sea level rise affecting tidally influenced areas (e.g., southern Napa County)
- Increased risk to public health, particularly from heat and air quality
- Impacts to agriculture, including crop viability and productivity
- Increased inland flooding and watershed instability

These stressors are not independent; rather, they interact to amplify overall hazard severity, particularly where multiple systems (e.g., water supply, agriculture, and infrastructure) are interdependent.

Table 3-63: Summary of Cal-Adapt Climate Projections for the Bay Area Region

Climate Variable	Projected Change	Implications for Napa County
Temperature	Increase of approximately 4°F to 6°F by late century, with greater increases during summer months	Increased extreme heat events, higher evapotranspiration, stress on water supply and agriculture
Precipitation	High variability with modest overall declines (approximately 1–5 inches annually by late century)	Increased drought risk, reduced groundwater recharge, and more variable water supply
Sea Level Rise	Approximately 1.6 to 3.1 feet by 2100 (statewide guidance)	Increased flooding and groundwater impacts in southern Napa County (e.g., Napa River and San Pablo Bay areas)
Heat Waves	Significant increase in frequency, duration, and intensity; up to 6–10 additional heat waves annually by late century	Elevated public health risks, increased energy demand, and impacts to outdoor labor and agriculture
Wildfire Risk	Increasing risk due to hotter, drier conditions and fuel accumulation	Greater likelihood of large, high-severity wildfires affecting watershed health and air quality

Source: Cal-Adapt; California Adaptation Planning Guide (2020); California Climate Change Assessment

Sea Level Rise

Sea level rise poses a moderate but increasing long-term hazard in Napa County, with the most significant impacts concentrated in low-lying, tidally influenced areas near the Napa River and San Pablo Bay. Rising sea levels contribute to more frequent and extensive tidal inundation, particularly when combined with storm surge, atmospheric river events, and high tide conditions. These combined factors increase the likelihood of coastal flooding, shoreline erosion, and elevated groundwater levels, which can degrade infrastructure performance and accelerate landward flood extents.

According to the State of California Sea Level Rise Guidance: 2024 Science and Policy Update, sea levels are projected to rise approximately 0.8 feet by 2050 and between 1.6 and 3.1 feet by 2100. These increases will significantly expand the area exposed to periodic and permanent inundation.

In Napa County, sea level rise threatens critical public and private assets, including wastewater treatment facilities, sewer conveyance systems, transportation corridors, and essential facilities such as emergency response services and detention facilities. Residential and commercial properties in southern Napa County, particularly in and around American Canyon and bay-adjacent areas, face increasing risk of chronic

flooding and infrastructure disruption. Over time, these impacts are expected to intensify, especially when combined with other climate-driven hazards such as extreme precipitation and storm events.

Agricultural Impacts

Climate change poses a high-severity risk to Napa County's agricultural sector due to the combined effects of extreme heat, drought, changing precipitation patterns, and wildfire. These stressors directly affect crop productivity, water availability, and long-term agricultural viability, particularly for the County's winegrape industry, which is highly sensitive to temperature and climate variability.

Rising temperatures and more frequent heat waves can result in crop stress, sunburn damage, reduced yields, and altered growing cycles, while elevated nighttime temperatures can negatively affect grape quality and harvest timing. Prolonged drought conditions further increase severity by reducing surface water supplies and increasing reliance on groundwater, which may already be under stress. In addition, shifts in precipitation patterns—characterized by more intense but less frequent storms—can reduce effective soil moisture and groundwater recharge.

Wildfire represents a significant compounding factor, with both direct damage to agricultural lands and indirect impacts such as smoke taint, which can render crops unmarketable. Climate change may also contribute to the expansion of pests and plant diseases, increasing management costs and production risks.

Given Napa County's economic reliance on agriculture and the sensitivity of specialty crops to climate conditions, these impacts represent a critical threat to both economic stability and land use sustainability. The severity of agricultural impacts is expected to increase over time as climate conditions continue to shift and compound hazard interactions become more pronounced.

3.3.9.8 Warning Time

As this section as described, many existing hazards could be intensified as a result of climate change, decreasing warning times and exacerbating impacts. Warning times are discussed under the various other hazards. Other climate change impacts are more long-term; scientists have a high confidence in predicting the rise in global temperatures and have reached a consensus on the future impacts of climate change and the time frame in which they will occur.

Identifying the presence of insects and pests in agricultural lands is the most important step in warning for an agriculture disaster. Once identified, preventing the insects and pests from establishing a population is critical. Communication between farmers to warn each other of the presence of invasive pests and insects so that appropriate measures can be taken to prevent them from establishing a population and negatively impacting crops.

3.3.9.9 Climate Change Vulnerability Assessment

This section evaluates Napa County's vulnerability to the direct and indirect impacts of climate change, with particular emphasis on sea level rise, which presents a spatially distinct and measurable risk within the planning area. Other climate-related impacts, such as extreme heat, drought, wildfire, and severe weather, are addressed in detail within their respective hazard profiles, reflecting their role as primary and interacting hazards.

In addition to physical hazards, climate change may exacerbate secondary impacts to the agricultural sector, including the spread of pests and diseases that can affect both economic productivity and, in some cases, public health. Consistent with guidance from Cal OES, mitigation of these risks includes the use of integrated pest management strategies and adaptive agricultural practices.

This vulnerability assessment considers how climate-driven changes may affect people, property, infrastructure, and natural systems, with a focus on identifying areas and populations most at risk and informing targeted mitigation and adaptation strategies.

Napa County's vulnerability to climate change is characterized by both spatially defined hazards, such as sea level rise (SLR), and system-wide impacts, such as agricultural sensitivity to changing climate conditions. This section differentiates between these two exposure types: (1) mapped hazard footprints, where risk can be geographically delineated, and (2) distributed vulnerabilities, where impacts occur across broad areas without a single defined hazard boundary.

3.3.9.9.1 Population

Climate change is expected to have increasing public health impacts across Napa County due to rising temperatures, wildfire smoke exposure, and extreme weather events. However, exposure to sea level rise is geographically limited and measurable. As shown in Figure 3-48 (Population Exposure to Sea Level Rise) and summarized in Table 3-65, approximately 1,450 residents (6.46%) in the unincorporated county are exposed under a 6-foot SLR scenario.

The mapped SLR hazard footprint demonstrates that population exposure increases incrementally with higher water levels, but overall remains a relatively small proportion of the County's total population. This reflects the localized nature of SLR risk, primarily affecting southern Napa County near San Pablo Bay and the lower Napa River.

In contrast, agricultural and climate-related health impacts are not confined to a mapped footprint. Extreme heat, wildfire smoke, and drought affect populations across the county, particularly outdoor workers, seniors, and low-income households, many of whom are employed in agriculture. These populations may face cumulative exposure to multiple climate stressors, even if they are not located within the SLR hazard area.

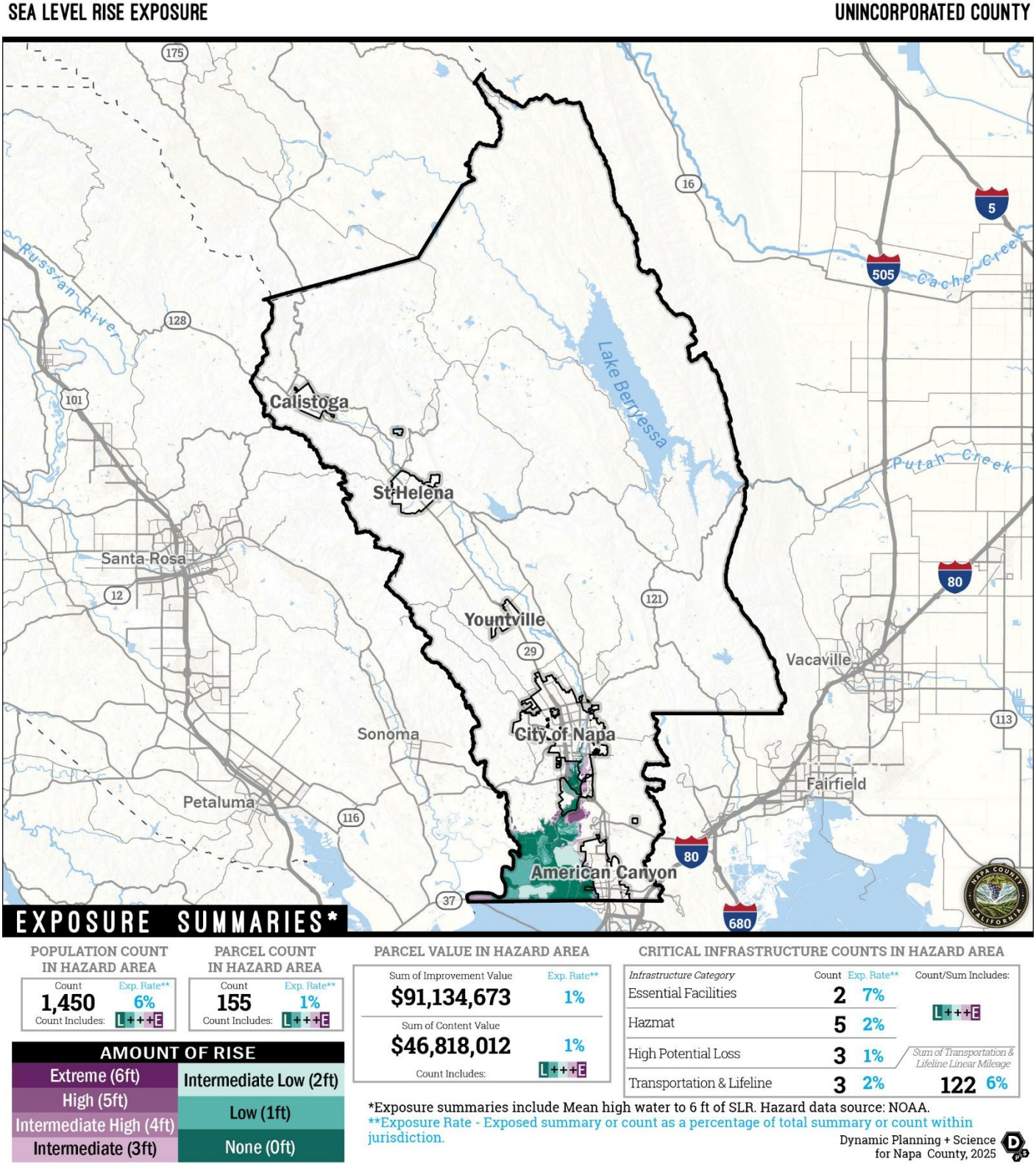


Figure 3-47: Exposure Summary – Napa County Sea Level Rise Risk

In Napa County, vulnerable populations are often concentrated in areas with higher exposure to environmental stressors, including extreme heat, wildfire risk, and potential flooding in low-lying areas. Figure 3-48 illustrates areas where populations may be more exposed to sea level rise and associated hazards, highlighting the intersection of physical risk and social vulnerability.

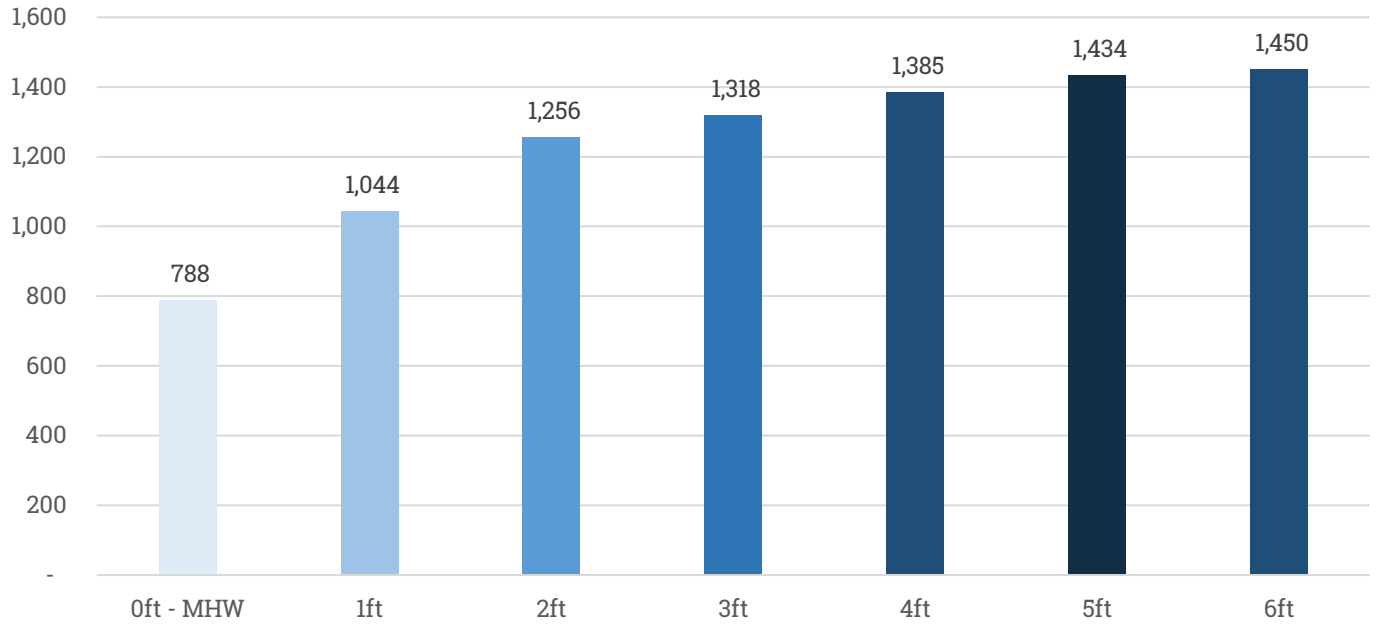


Figure 3-48: Napa County Population Exposure to Sea Level Rise

Table 3-64: Napa County Population Exposure to Sea Level Rise

	Total Population
Unincorporated County	22,468

Sea Level Rise (Feet Above Mean High Water)	Population Count	% of Total
0ft - MHW	788	*3.51%*
1ft	1,044	*4.65%*
2ft	1,256	*5.59%*
3ft	1,318	*5.86%*
4ft	1,385	*6.17%*
5ft	1,434	*6.38%*
6ft	1,450	*6.46%*

Disproportionately Impacted Populations

Climate change impacts in Napa County are not experienced uniformly. As identified in Section 1.5.3, certain populations are disproportionately vulnerable due to a combination of age, health status, occupation, income, language access, and housing conditions. Approximately 17% of the County's population is age 65 or older, representing about 18,777 households, and 33% identify as Hispanic or Latino, indicating a substantial portion of residents may face elevated sensitivity to climate-related hazards.

Extreme heat represents one of the most significant public health risks associated with climate change. Older adults are particularly vulnerable to heat-related illness, including heat exhaustion and heat stroke, as well as exacerbation of pre-existing respiratory and cardiovascular conditions. Many seniors may live alone or have limited mobility, increasing challenges related to evacuation, access to cooling, and recovery during prolonged extreme heat events and associated power outages.

Napa County's agricultural workforce, which is largely Hispanic and includes many low-income and Spanish-speaking individuals, faces elevated exposure to climate hazards due to the nature of outdoor labor. Climate change is expected to increase the frequency and intensity of extreme heat and wildfire smoke events, which can reduce productivity and, in severe cases, lead to illness, injury, or death. Language barriers and limited access to resources may further reduce the effectiveness of emergency communications and preparedness efforts.

Additional vulnerable groups include renters and lower-income households, who may have limited ability to implement structural mitigation measures or access post-disaster recovery resources. Individuals with access and functional needs, including those with disabilities or limited transportation, may also face increased challenges during evacuations or extended service disruptions. These disparities highlight the importance of incorporating equity-focused strategies into climate adaptation and hazard mitigation planning.

Sea Level Rise

Approximately 6.46% of the unincorporated County population (1,450 residents) is currently located within the mapped sea level rise hazard area under a 6-foot scenario, as shown in Figure 3-48 and Table 3-71. While this represents a relatively small portion of the overall population, exposure increases incrementally with rising water levels, and the geographic extent of flooding is expected to expand over time.

Populations located in low-lying areas of southern Napa County, particularly near San Pablo Bay and the lower Napa River, may face increasing risk from tidal inundation, storm-related flooding, and elevated groundwater conditions. These impacts are expected to become more frequent and persistent as sea levels continue to rise.

Factors that increase vulnerability to sea level rise include limited access to preparedness information, transportation, healthcare, and insurance, as well as socioeconomic characteristics such as income, language proficiency, and housing tenure. Linguistically isolated populations may face additional

challenges in receiving and understanding emergency warnings and recovery information, while renters and lower-income households may have fewer resources to prepare for or recover from recurrent or chronic flooding conditions.

Agricultural Impacts

Agricultural impacts related to climate change pose a significant risk to both the local economy and populations directly employed in the agricultural sector. Napa County's agricultural production value exceeds $1 billion annually, and the industry is highly sensitive to changes in temperature, water availability, and extreme weather conditions.

Unlike sea level rise, which affects a defined geographic area, agricultural impacts occur across the entire County, particularly within the valley floor and vineyard areas Climate change is expected to increase the frequency and intensity of extreme heat, drought, and wildfire, all of which can disrupt crop production, alter growing conditions, and affect long-term agricultural viability.

These impacts disproportionately affect agricultural workers, who are often exposed to hazardous environmental conditions such as extreme heat and wildfire smoke. Many of these workers may have limited access to healthcare, financial resources, and workplace protections, increasing their vulnerability to climate-related hazards.

In addition to economic and workforce impacts, climate change may influence the distribution and prevalence of agricultural pests and vector-borne diseases, which can affect both crop productivity and public health. Changing environmental conditions may increase the presence and range of disease-carrying insects, requiring ongoing monitoring and adaptive management strategies to protect agricultural resources and surrounding communities.

3.3.9.9.2 Property

Sea level rise presents a quantifiable risk to property within a defined hazard footprint. As shown in the Sea Level Rise Exposure Map and summarized in Table 3-65 (Parcel Exposure), approximately 155 parcels (1.1%) are exposed under a 6-foot SLR scenario, representing over $137 million in total property value.

The mapped hazard area is concentrated in low-lying of southern Napa County, including areas near American Canyon and the Napa River corridor. While current exposure is relatively limited, the data demonstrate a progressive increase in both parcel count and value at risk as sea levels rise.

It is important to note that much of the land within the SLR hazard footprint is currently undeveloped or in agricultural use. While this reduces immediate structural exposure, it highlights a key distinction:

SLR impacts are spatially concentrated and mappable, whereas agricultural impacts occur across the entire valley floor and upland growing regions, driven by temperature, water availability, and soil conditions rather than inundation.

Agricultural properties outside the SLR footprint may still experience significant climate-related impacts, including heat stress, water scarcity, and erosion, which are not captured in SLR exposure mapping.

Table 3-65: Napa County Parcel Exposure to Sea Level Rise

	Total Parcels		Total Market Value ($)	Total Content Value ($)	Total Value ($)	
Unincorporated County	13,668		$11,215,199,644	$9,248,691,039	$20,463,890,683	

Sea Level Rise	Parcel Count	% of Total	Market Value Exposure ($)	Content Value Exposure ($)	Total Exposure ($)	% of Total
0ft - MHW	112	*0.8%*	$70,888,727	$35,706,164	$106,594,891	*0.5%*
1ft	113	*0.8%*	$71,680,502	$36,102,051	$107,782,553	*0.5%*
2ft	121	*0.9%*	$75,658,928	$38,091,265	$113,750,193	*0.6%*
3ft	133	*1.0%*	$82,614,266	$41,839,340	$124,453,605	*0.6%*
4ft	136	*1.0%*	$84,423,916	$42,744,165	$127,168,080	*0.6%*
5ft	146	*1.1%*	$87,207,245	$44,135,832	$131,343,077	*0.6%*
6ft	155	*1.1%*	$91,134,673	$46,818,012	$137,952,685	*0.7%*

3.3.9.9.3 Critical Facilities & Infrastructure

Critical facilities and infrastructure exposure to sea level rise is also spatially defined and quantifiable. As summarized in Table 3-66 (Critical Facility Exposure), a limited number of essential facilities, transportation assets, and hazardous material sites fall within the SLR hazard area, with exposure increasing under higher rise scenarios.

Additionally, lifeline infrastructure, including levees, pipelines, rail, and roadway networks, shows increasing exposure as sea levels rise, with total affected infrastructure expanding from approximately 34.7 miles at current conditions to over 120 miles under a 6-foot scenario. See Table 3-67.

The exposure maps illustrate that infrastructure vulnerability is concentrated in southern and tidally influenced areas, where flooding, groundwater rise, and backwater effects may disrupt operations.

In contrast, agricultural infrastructure (e.g., irrigation systems, vineyards, rural roads) is vulnerable to climate change across a much broader area. These impacts are driven by heat, drought, and extreme weather, rather than a single mapped hazard footprint, and therefore require different assessment and mitigation approaches.

Table 3-66: Napa County Critical Facility Exposure to Sea Level Rise

Critical Infrastructure - Sea Level Rise							
Infrastructure Type	0ft - MHW	1ft	2ft	3ft	4ft	5ft	6ft
Essential Facilities	1	1	1	1	1	1	2
EOC	-	-	-	-	-	-	-
Fire Station	1	1	1	1	1	1	1
Hospital	-	-	-	-	-	-	-
Law Enforcement	-	-	-	-	-	-	1
High Potential Loss	1	1	1	1	1	3	3
Adult Residential Care	-	-	-	-	-	-	-
Child Care Center	-	-	-	-	-	-	-
Church	-	-	-	-	-	-	-
Communication Tower	-	-	-	-	-	-	-
Dam	-	-	-	-	-	-	-
Emergency Shelter	-	-	-	-	-	-	-
Farm Worker Housing	-	-	-	-	-	-	-
Historic Building	-	-	-	-	-	-	-
Library	-	-	-	-	-	-	-
Mobile Home Park	-	-	-	-	-	-	-
Res Elder Care Facility	-	-	-	-	-	-	-
Private School	-	-	-	-	-	-	-
Public School	-	-	-	-	-	-	-
Real Property Asset	1	1	1	1	1	3	3
Transportation and Lifeline	1	1	1	1	2	3	3
Airport	-	-	-	-	-	-	-
Bridge	1	1	1	1	1	1	1
Bus Stop	-	-	-	-	-	-	-
HMMWC Asset	-	-	-	-	-	-	-
HMMWC Dam	-	-	-	-	-	-	-
HMMWC Hydrant	-	-	-	-	-	-	-
NG Station	-	-	-	-	-	-	-
Power Plant	-	-	-	-	1	2	2
Substation	-	-	-	-	-	-	-
Wastewater Treatment Facility	-	-	-	-	-	-	-
Water Supply Intake	-	-	-	-	-	-	-
Water Tank	-	-	-	-	-	-	-

Critical Infrastructure - Sea Level Rise							
Infrastructure Type	0ft - MHW	1ft	2ft	3ft	4ft	5ft	6ft
Water Treatment Facility	-	-	-	-	-	-	-
Hazmat	1	1	2	5	5	5	5
Geotracker CleanupSite	-	-	-	-	-	-	-
HWTS Active Facility	1	1	2	5	5	5	5
Landfill	-	-	-	-	-	-	-
Grand Total	**4**	**4**	**5**	**8**	**9**	**12**	**13**

**Real Property Assets are digitized insurance rolls for demonstrating value and ownership and may have overlapping points with other categories such as fire stations and law enforcement.*
-Sea Level Rise Risk is cumulative

Table 3-67: Napa County Lifeline Infrastructure Exposure to Sea Level Rise

Lifelines (miles) - Sea Level Rise							
Infrastructure Type (Linear)	0ft	1ft	2ft	3ft	4ft	5ft	6ft
Levee	30.0	44.9	70.8	80.2	86.2	91.5	93.8
NG Pipeline	0.2	0.3	0.4	1.1	1.3	1.5	1.7
Railroad	0.8	1.0	1.8	2.7	3.5	4.2	4.8
Transmission Line	1.9	2.8	2.9	4.4	4.5	4.6	4.7
Street OSM	1.9	2.5	4.3	7.2	10.0	13.4	16.6
Highway & Interstate	-	-	-	-	-	-	-
Major Road	0.2	0.3	0.5	0.5	0.7	1.1	1.2
Residential Road	1.6	1.8	2.1	2.5	2.8	2.9	3.2
Road - Secondary	-	-	-	-	-	-	-
Road - Tertiary	-	-	-	-	-	-	0.0
Service Road	0.1	0.3	1.3	3.3	5.3	7.9	10.5
Unclassified	0.0	0.1	0.4	0.9	1.2	1.4	1.6
Grand Total	**34.7**	**51.5**	**80.2**	**95.6**	**105.5**	**115.2**	**121.7**

3.3.9.10 Development Trends

Napa County's development patterns and policy framework reflect a strong commitment to reducing climate-related risks and supporting long-term resilience. Through a combination of land use regulations, sustainability programs, and regional partnerships, the county has established a foundation for addressing current climate hazards such as extreme heat, drought, wildfire, and flooding. However, as climate conditions continue to change, these hazards are expected to increase in frequency and severity, placing additional pressure on existing systems and development patterns.

Growth in Napa County remains largely guided by policies that emphasize agricultural preservation, urban-centered development, and protection of watershed and open space lands. These development constraints help limit exposure to certain hazards, such as wildfire in undeveloped areas and flooding in sensitive areas, while also preserving natural systems that provide climate resilience benefits, including groundwater recharge and temperature regulation.

The county continues to support a range of programs and initiatives that promote sustainable development and climate adaptation. Efforts such as Sustainable Napa County, the Napa Green Certification Program, and implementation of the California Green Building Standards Code (CALGreen) encourage reduced energy use, improved water efficiency, and environmentally responsible building and agricultural practices. Participation in regional energy programs, including Marin Clean Energy (MCE), further supports the transition toward renewable energy and reduced greenhouse gas emissions.

These efforts are being advanced through the development of the Regional Climate Action and Adaptation Plan (RCAAP), which expands the County's approach from emissions reduction to a more comprehensive strategy that integrates climate adaptation, hazard mitigation, and resilience planning. The RCAAP identifies the need to scale up existing programs and incorporate climate considerations more consistently into land use planning, infrastructure investment, and development review processes.

Despite these efforts, continued development, particularly in rural, hillside, and agricultural areas, may increase exposure to climate-related hazards if not carefully managed. Future development will need to account for changing hazard conditions, including increased wildfire risk, water supply constraints, and extreme heat, as well as the cumulative impacts of multiple hazards over time.

In addition, climate change is expected to influence agricultural practices and pest dynamics, requiring ongoing coordination between the County, agricultural producers, and regulatory agencies. Existing programs, such as the Winegrape Pest and Disease Control District, will continue to play an important role in monitoring and managing pest risks, while adaptation strategies may include improved data collection, integrated pest management, and enhanced information sharing to support agricultural resilience.

Overall, Napa County's development trends are generally aligned with climate resilience goals; however, expanded implementation, continued coordination, and integration of climate projections into planning decisions will be necessary to effectively address future climate-related risks.

3.3.9.11 Climate Change Hazard Problem Statements

As part of the mitigation action identification process, the Napa County Planning Team developed areas of concern (i.e., problem statements) that summarize the county's most pressing climate change-related vulnerabilities and challenges. The problem statements were developed based on the updated risk assessment and vulnerability analysis contained herein, as well as the team's local knowledge and experience and community input. The problem statements address a broad spectrum of concerns, from direct impacts on residents and vulnerable populations to threats to critical infrastructure and long-term recovery.

These problem statements are not intended to be all-encompassing or to describe each and every issue associated with climate change. Instead, they highlight the most urgent concerns that can be addressed within the scope of this MJHMP. Each statement will be linked to at least one mitigation action, ensuring that identified needs are met with specific, measurable, and equitable solutions. Table 3-68 presents the climate change problem statements for Napa County, along with their associated areas of concern and reference numbers for cross-linking to the mitigation actions in Table 4-4.

Table 3-68: Napa County Climate Change Hazard Problem Statements

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-AG-NCo-0	Climate Change	Impact	**Napa County**	Climate change is altering the growing season, causing bud break sooner and leaving new vine growth vulnerable to frost for extended periods, and intensifying pest and pathogen risks by shifting species composition, expanding breeding seasons, and accelerating disease transmission.	ma-CC-NCo-17, ma-AG-NCo-1, ma-AG-NCo-2
ps-AG-NCo-1	Climate Change	Victim	**Napa County**	The agricultural industry in Napa County is a main driver of the local economy, and agricultural impacts from climate change and other natural disasters could adversely affect the entire community but especially food and wine industry workers.	ma-CC-NCo-17, ma-AG-NCo-2, ma-AG-NCo-1, ma-CC-NCo-18
ps-CC-NCo-4	Climate Change	Threat	**Napa County**	Napa County's capital improvement programs for critical facilities and infrastructure do not consistently incorporate projections for future sea-level rise, tidal flooding, or associated climate-driven shoreline hazards, potentially leaving assets in low-lying areas vulnerable to associated impacts.	ma-CC-NCo-13, ma-CC-NCo-14, ma-DR-NCo-26, ma-FL-NCo-51, ma-FL-NCo-54, ma-FL-NCo-57
ps-CC-NCo-7	Climate Change	Threat	**Napa County**	The confluence of climate change-driven sea-level rise, atmospheric river and heavy rain events, and King Tides poses risks to areas along the Napa River, including industrial uses, wineries, and parts of Downtown Napa.	ma-CC-NCo-13, ma-CC-NCo-14, ma-AG-NCo-1, ma-FL-NCo-54, ma-FL-NCo-57

Section 4. Mitigation Strategy

This section describes the mitigation strategies developed for the 2026 MJHMP to reduce or eliminate the long-term risks of high-priority hazards impacting Napa County. Building upon the findings of the risk assessment detailed in 0, the strategies in this plan outline prioritized mitigation actions, projects, and policies aimed at safeguarding vulnerable populations, protecting property and critical infrastructure, and enhancing overall community resilience.

4.1 Mitigation Goals

Hazard mitigation plans must define clear goals for reducing long-term vulnerabilities to natural hazards. For this plan, the county-wide Hazard Mitigation Planning Team established goals using findings from the risk assessment, input from the planning team, and feedback from the public gathered through surveys, stakeholder interviews, and document review. The four goals, developed by the Planning Team and confirmed by jurisdictional teams, outline broad priorities for protecting people, property, services, infrastructure, and the environment. These goals provide the framework for the 2026 Napa County Mitigation Strategy. The mitigation actions that follow are specific and measurable steps designed to achieve these goals through both jurisdiction-specific initiatives and a coordinated county-wide approach.



Goal 1: Protect people from loss of life, injury, and economic damage from hazards.

Goal 2: Protect critical facilities, infrastructure, property, and the continuity of essential services from hazards.





Goal 3: Preserve natural resources and ecological functions as hazard mitigation.

Goal 4: Promote community resilience through planning, policies, capital improvements, education, and inter-jurisdictional collaboration.



4.2 Capabilities & Opportunities

This section provides a detailed assessment of the current capabilities of Napa County to support hazard mitigation, as well as future opportunities and funding options. This consists of describing how the county is planning for hazards and growth and a summary of its existing capabilities and the potential for enhancement. A summary of funding opportunities to advance the goals of this MJHMP is also provided in this section, including state and federal mechanisms and ways the participating jurisdictions can leverage their shared resources to fund coordinated mitigation efforts.

Volume 2 of this MJHMP describes the planning efforts, existing capabilities, and future opportunities for each of the other participating jurisdictions as part of their annexes. Additional details about the regulatory environment surrounding each hazard are found in the hazard profiles in Section 3.3.

4.2.1 Planning for Hazards & Growth

Napa County and the incorporated municipalities each maintain general plans that serve as the foundation for guiding land use, development, and long-term community priorities. Napa County is a general law county, which means it establishes and enforces its own development regulations in compliance with the State of California's stringent planning, zoning, subdivision, building, and environmental standards. This framework ensures that future development in the unincorporated areas is carefully managed, with a strong emphasis on recognizing and mitigating the impacts of natural hazards.

For example, the Napa County Flood Control and Water Conservation District continues to implement its Napa River Flood Management Plan to protect existing development from flood impacts and reduce or mitigate impacts from new development in floodplains. Napa County and the Cities of American Canyon, Napa, St. Helena, and Calistoga and the Town of Yountville collectively administer the Napa County Stormwater Pollution Prevention Program. The communities in the Napa County Operational Area have all adopted Seismic Retrofit ordinances to reinforce all historic buildings. And all municipalities in the county have adopted similar building and fire codes to streamline permitting and enforcement and ensure consistent protective standards for new development.

The county's General Plan, alongside the general plans of participating municipalities such as the City of Napa and Town of Yountville, provide comprehensive planning frameworks that integrate hazard mitigation strategies into land use decisions, community safety, and infrastructure investments. These plans address long-term issues such as sustainable growth, climate change resilience, and protection of vulnerable populations.

Incorporating hazard analysis into general plans and development regulations enables both the county and its municipalities to meet state requirements while reducing risks from natural hazards such as wildfire, flooding, drought, and extreme heat. Climate change is increasing the frequency and severity of these hazards, underscoring the importance of proactive planning and durable mitigation strategies.

Through coordinated planning, adherence to strict environmental regulations, and investment in resilience measures, the county and municipalities are working to foster sustainable, safe, and adaptable communities. Together, these efforts provide a consistent and comprehensive approach to balancing growth with hazard risk reduction and climate adaptation across the region.

4.2.1.1 Long-Range Planning & Growth Management

Anticipating future growth in Napa County requires a proactive approach that balances state housing mandates with local hazard mitigation priorities. Growth management has long been a defining feature of the county's planning framework. Since 1968, an Agricultural Preserve has been established in Napa County, concentrating growth within incorporated municipalities and established unincorporated communities while limiting sprawl into rural and hazard-prone areas. Agricultural and rural preservation goals were further implemented by the adoptions of Measure A (Growth Management System) in 1980 and Measure J in 1991, significantly limiting the conversion of designated agricultural lands for non-agricultural uses. This framework, combined with California's stringent planning, zoning, subdivision, building, and environmental standards, helps ensure that future development occurs in areas with appropriate infrastructure and lower hazard exposure.

At the same time, all municipalities in Napa County are subject to the State's Regional Housing Needs Allocation (RHNA), which requires each to plan for a fair share of new housing across all income levels. Accommodating RHNA targets in a county constrained by agricultural preservation, steep topography, and hazard-prone landscapes creates both opportunities and challenges. Most new housing will need to be located within existing urban centers such as Napa, American Canyon, St. Helena, Yountville, and nearby unincorporated communities, where infrastructure is already in place. Concentrating growth in these areas helps to preserve rural lands and environmentally sensitive habitats, but also underscores the importance of investing in resilient infrastructure and retrofitting older housing stock that remains vulnerable to natural hazards.

The Napa County General Plan, last updated in 2023, serves as the overarching blueprint for managing this growth while addressing hazard resilience. Its Safety Element establishes policies for natural hazards including flood, wildfire, and earthquake hazards, and is being further updated to integrate this MJHMP. Other General Plan elements, such as the Agricultural Preservation and Land Use Element, direct land use and housing decisions in a way that complements hazard mitigation goals. Together, these planning frameworks ensure that decisions about future development are informed by the most current hazard data and mitigation strategies.

By aligning growth management tools such as Measures A and J, the General Plan, and RHNA compliance with hazard mitigation priorities, Napa County and the incorporated municipalities are working to achieve two critical goals: meeting the region's pressing housing needs and reducing long-term risk to people, property, and natural systems. As one more step toward reducing hazard risk, the County and municipalities will adopt this MJHMP by reference into their general plans pursuant to AB 2140, ensuring stronger integration between hazard mitigation and long-range land use planning.

4.2.1.2 Building Codes & Development Standards

Napa County's development strategies integrate comprehensive planning frameworks and regulatory measures to guide growth while minimizing risks from natural hazards. Nationally, building codes have continually improved disaster resilience and, since 1990, those great improvements have added approximately one percent to construction costs. (National Institute of Building Sciences, 2019) In addition, California's building codes are considered some of the world's most robust and set minimum standards to safeguard against many of the natural hazards that affect communities within the state. These codes form a strong foundation for safe construction practices which the county and municipalities enforce.

The county is required to regularly update its building and development codes to meet the minimum standards required by California, including the CBC which was last updated in 2025. California's minimum code requirements provide some of the safest construction standards in the world and are meant to reduce risk to occupants from high wind, seismic activity, landslides, flood, wildfire, and other natural hazards. Further, climate change impacts are also required to be addressed through the adoption and regular updating of California's Green Building Standards and Energy Codes.

For flood hazards, specifically, Napa County participates in the National Flood Insurance Program (NFIP) and Community Rating System (CRS), in addition to adhering to other California minimum floodplain development standards. All development within designated flood hazard areas must meet minimum flood protection standards as set forth by FEMA; however, the county has adopted higher standards than the NFIP minimums, including a requirement to elevate or floodproof the lowest floor of structures at least one foot above the base flood elevation, known as a "freeboard." A freeboard is a factor of safety for purposes of floodplain management to compensate for the many unknown factors that could contribute to flood heights or elevations greater than what is anticipated on regulatory flood maps, such as bridge openings, climate change, sea level rise, and the hydrological effect of watershed urbanization.

The Napa County Code incorporates stringent building and development regulations to mitigate hazards for both new and existing structures, and many chapters of the code recognize the diverse terrain found throughout the county by differentiating between valley, mountain, and other areas where hazard risks and impacts may vary greatly. These code sections include:

- 2025 California Building, Mechanical, Plumbing, Electrical, Existing Building, Residential, Green Building Standards, Energy, and Historical Building Codes (Title 15)
- Wildland-Urban Interface and Fire Codes (Chapters 15.13 and 15.32), including construction and design, defensible space, vegetation management, and emergency access requirements in compliance with the 2025 California Fire Code
- Environment Regulations (Title 16), including requirements for specific hazardous uses and areas and for stormwater management
- Floodplain Management Regulations (Chapter 16.04), in compliance with NFIP requirements and including higher standards such as a one-foot freeboard

- Zoning Ordinance (Title 18), including agricultural, timber, and watershed preservation zones and development standards; slope grading, erosion control, water quality, and landscape preservation requirements; water conservation regulations for landscaping and groundwater; and other standards related to General Plan conformity and public safety
- Subdivision Ordinance (Title 17), including General Plan conformity requirements and design standards that prohibit subdivision in wildfire, flood, geologic, or other hazard areas without adequate mitigation

These regulations are designed to protect public health, safety, and welfare, and to limit the impacts of natural disasters on development. In the county's hazard-prone areas, new development is limited and, where development is feasible and permitted, these codes emphasize minimizing exposure and vulnerability to hazard risks through appropriate siting, advanced construction techniques, maintaining adequate access for emergency services, and other mitigation methods.

4.2.1.3 Environmental Regulations

Napa County anticipates and plans for its future growth while maintaining a robust regulatory framework to mitigate exposure and vulnerability to hazards. Further, the State of California has some of the most rigorous environmental regulations in the nation to which the county, municipalities, and all new development within them are bound.

California Environmental Quality Act (CEQA)

Under the California Environmental Quality Act (CEQA), the county's General Plan and any specific plans that propose land use changes or significant development projects must include extensive evaluations of hazards and potential impacts. CEQA analysis requires consideration of factors such as proximity to floodplains, wildfire-prone areas, or seismic zones. Additionally, mitigation measures proposed in CEQA documents aim to reduce environmental and hazard-related risks, including updates to infrastructure, evacuation planning, or restrictions on development in high-risk areas.

For example, if a specific plan proposes rezoning to allow residential development in a previously undeveloped area near the wildland-urban interface (WUI), CEQA would necessitate an assessment of wildfire risk to the development. The resulting analysis might recommend increased setbacks, advanced fire-resistant construction materials, and enhanced emergency access to mitigate identified hazards.

CEQA also requires analysis and mitigation of environmental impacts related to climate change. As part of the review process, for example, the proposed development's contributions to greenhouse gas (GHG) emissions must be evaluated and mitigation techniques or other alterations to the project may be required to reduce future emissions that could result from the project.

California Climate Change Legislation

In California, counties and municipalities are required to address climate change through various state laws and policies designed to promote sustainability, reduce GHG emissions, and increase resilience to climate-related hazards. In addition to applicable CEQA requirements and the county's adopted sustainability standards outlined in Section 4.2.1.2, key senate bills (SB), assembly bills (AB), executive orders (EO), and other state environmental legislation includes:

- **SB 375 – Sustainable Communities and Climate Protection Act:** Requires jurisdictions to integrate regional transportation planning and land use to reduce GHG emissions, particularly by fostering development near transit hubs and reducing vehicle miles traveled.
- **AB 32 and SB 32 – Global Warming Solutions Act and Amendments:** Mandates that jurisdictions contribute to California's broader goals of reducing GHG emissions to 40% below 1990 levels by 2030 and achieving carbon neutrality by 2045.
- **SB 379 – General Plan Safety Element:** Requires jurisdictions to incorporate climate adaptation and resilience strategies into the safety element of their general plan to address risks such as wildfires, extreme heat, drought, and sea-level rise.
- **SB 1000 – General Plan Environmental Justice Element:** Mandates the inclusion of an environmental justice element in general plans for communities which have been (or are anticipated to be) disproportionately impacted by environmental hazards, often compounded by climate change.
- **Title 24 – California Building Code (CBC):** Establishes energy efficiency and renewable energy requirements to reduce GHG emissions from the built environment, which jurisdictions enforce through local permitting processes.
- **EO B-30-15 and EO N-79-20:** Establish statewide targets for climate resilience and decarbonization of transportation and energy sectors, influencing local and regional planning efforts.

Napa County incorporates these state mandates into its local planning, leveraging the General Plan and hazard mitigation strategies to prepare for the increasing risks of wildfires, drought, flooding, coastal hazards, severe weather, and extreme heat caused and compounded by climate change. By aligning with state goals, the county ensures its development contributes to a sustainable and resilient future for its communities.

4.2.2 Napa County Capabilities & Opportunities Assessment

To develop a realistic and actionable mitigation strategy, it must account for existing jurisdictional capabilities and what future opportunities there are to enhance those capabilities for purposes of hazard mitigation. This section provides an assessment of Napa County's existing capabilities and future opportunities. This assessment also identifies opportunities to integrate this MJHMP into future planning, policies, or programs to weave mitigation efforts into daily operations and address hazard problems wholistically. Capabilities are categorized into four groups and include various mechanisms.

- **Planning and Regulatory Capabilities:** Existing long-range plans, emergency response plans, hazard-specific plans, land use policies, and building and development standards.
- **Administrative and Technical Capabilities:** Available expertise in emergency services, engineering, grant management, and community planning.
- **Fiscal Capabilities:** Budgetary capacity, taxing authority, grants, and other funding mechanisms that can support mitigation projects.
- **Outreach and Education Capabilities:** Existing programs for providing technical assistance, community education, public warnings, and stakeholder engagement.

A full description of the process used to develop the capabilities and opportunities assessments is provided in Section 2.3.3. The capabilities and opportunities assessments for other participating jurisdictions are found in the Volume 2 annexes of this plan.

Expanding & Improving Existing Capabilities

The capabilities assessment exercise presents an opportunity for Napa County and the other participating jurisdictions to examine what capabilities they do and do not currently have and where it makes the most sense to expand and improve upon those capabilities in the future. These assessments shaped mitigation actions for hazards generally and specifically that focus on expanding and improving existing planning mechanisms, policies, and programs. The expansions and improvements were based upon identified vulnerabilities and areas of concern specific to each jurisdiction, as profiled in Volume 1, Section 3.3, and each jurisdiction's annex in Volume 2.

The three "HMP Integration" columns that identify the capability's status and usage are color-coded with green, yellow, or orange shading to communicate the following:

- **Status:** If the capability is present at all and what level of use it has generally.
- **Current Mitigation Use:** If the capability is currently being used in mitigation efforts, specifically, and at what level.
- **Future Opportunity:** If there is a future opportunity to integrate the capability into mitigation efforts and at what level.

Napa County Capabilities & Opportunities Summary

This Capabilities and Opportunities Assessment for Napa County summarizes the various types of capabilities it has for hazard mitigation currently. The assessment also identifies opportunities to integrate, expand, and improve the county's capabilities for future hazard mitigation. Table 4-1 provides a comprehensive list of capabilities and identifies the current status, current mitigation use, and future opportunities.

Planning & Regulatory

Napa County demonstrates strong planning and regulatory capabilities, with most planning mechanisms currently in use and widely applied to hazard mitigation. The County has adopted the 2025 California

Building Standards Code, maintains hazard-related development standards, and enforces zoning, floodplain, stormwater, and fire regulations that directly reduce risk. Long-range planning documents such as the General Plan, Community Wildfire Protection Plan, Emergency Operations Plan, Climate Action and Adaptation planning, and the Capital Improvement Program are all actively used to support mitigation.

Key opportunities for future hazard mitigation plan integration are to more explicitly link mitigation actions to implementation mechanisms already embedded in the Capital Improvement Program, Climate Action Plan, CWPP, and building and development codes, ensuring that mitigation priorities directly inform capital investments, long-range planning decisions, and regulatory updates (e.g., ma-EQ-NC-XX, ma-FL-NC-XX, and ma-DR-NC-XX). This MJHMP prescribes multiple mitigation actions that further integrate hazard mitigation, including results of the updated vulnerability assessment, into these existing mechanisms.

Administrative & Technical

The county's administrative and technical capacities are also strong, with existing personnel, departments, and systems in place to support mitigation planning and implementation. Planning, engineering, building, floodplain management, emergency management, GIS, and public works staff are all available and actively involved in mitigation-related work. ALERT Napa County, WEA, and IPAWS provide robust multi-hazard warning capability. An opportunity for enhanced integration lies in formalizing the use of hazard mitigation data—such as risk assessments, damage histories, and equity considerations—across departments, particularly by adopting prioritization frameworks for resource allocation and increasing interagency coordination. The integration of updated hazard mapping informed by climate change is also a priority in this plan.

Fiscal

The county's fiscal capabilities are moderate, with several funding tools already in use but not always applied specifically to hazard mitigation. The County uses development fees, stormwater fees, capital improvement funding, and CDBG funds, among other mechanisms. Bonding, special taxes, and benefit assessments are available but used selectively and rarely to support mitigation. Key integration opportunities include aligning the Capital Improvement Program with mitigation priorities and expanding the use of CDBG, special districts, and bond financing for resilience projects, particularly for flood, wildfire, and infrastructure protection.

Education & Outreach

The county's education and outreach capabilities are generally strong, including tools such as Ready Napa County, social media, CERT, Firewise communities, Fire Safe Councils, public safety events, and technical assistance. These programs provide a foundation for community preparedness and mitigation awareness. Some outreach tools could still be expanded, such as public education through more formalized campaigns, additional printed resources, or participation in national preparedness programs.

A key opportunity for integration is linking hazard mitigation initiatives with county outreach, Firewise and Fire Safe Council programs, and climate adaptation education, which would improve public understanding of risk reduction actions and increase participation in mitigation efforts. A major county-wide priority in

this plan is to collaborate with the other participating jurisdictions to create a coordinated public outreach and education strategy through consistent, aligned messaging. This effort will leverage partnerships with trusted voices and existing social networks to reach diverse communities with out-of-the-box resources and tools that are highly inclusive and accessible.

ASSESSMENT LEGEND

HMP Integration

Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Table 4-1: Napa County Capabilities and Opportunities Assessment

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Planning and Regulatory Capabilities				
Construction and Future Development Regulations				
Building Codes				2025 California Building Standards Code (Title 24) adopted; County also adopts 2025 CA codes by ordinance (e.g., Existing Building Code; Mechanical; Fire Code)
BCEGS Rating				Rating of 3
Public Protection (ISO Class)				Class 6
Hazard-Related Development Standards				Water Conservation for Landscape Design (Ch. 18.118); Groundwater Conservation (Ch. 17.59) Fire Code (Ch. 15.32); Fire Zone Regulations (Ch. 8.32); Floodplain Ordinance (Ch. 16.04); Stormwater Mgmt (Ch. 16.28)
Zoning Ordinance				Title 18, including Agricultural Preserve and Watershed Districts (Ch. 18.16 and 18.20) protect agriculture, watersheds and floodplain tributaries from fire, pollution and erosion; Conservation Regulations (Ch. 18.108) protect from excessive soil loss and water quality/ quantity issues; Groundwater Conservation (Ch. 18.141); Water Conservation for Landscape Design (Ch. 18.118)

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Planning and Regulatory Capabilities				
Hazard-Specific Ordinance				Groundwater Conservation (Ch. 17.59); Fire Code (Ch. 15.32); Fire Zone Regulations (Ch. 8.32); Floodplain Ordinance (Ch. 16.04); Stormwater Mgmt (Ch. 16.28); Western Grapeleaf Skeletonizer Control Regulation (Ch. 8.40)
Growth Management Ordinance				Growth Management System part of GP (Ag. Preservation and Land Use Elements); Implemented by Housing Allocation Program in County Code (Ch. 8.02)
Hazard Reduction Programs (Annually Conducted)				
Capital Improvements Program (CIP) or Plan				CIP 5-year program General Plan
Erosion/Sediment Control Program				Ch 16 and 18 of Code of Ordinances Erosion Control Plan
Hazard-Related Public Outreach Program				See Education and Outreach Capabilities
Urban Water Management Plan				Groundwater Conservation (Ch. 17.59); Groundwater Sustainability Plan
Stormwater Management Program (Annual Inspections)				Stormwater Mgmt (Ch. 16.28); Groundwater Sustainability Plan
Seismic Safety Program (Non-structural)				Through Ready Napa County program
Earthquake Modernization Plan (Building Safety)				2022 California Building Standards Code (Title 24) adopted, including statewide seismic standards
Hazard Plans				
General Plan Safety Element				General Plan updated 2013
Site Plan Review Requirements				Titles 16 & 18
General Plan Environmental Justice Element				No standalone EJ element but addressed in Housing and other elements
Community Wildfire Protection Plan (CWPP)				Countywide CWPP adopted May 2021; to be updated 2026
Economic Development Plan				Adopted element of the General Plan; 2019–2022 Strategic Plan
Floodplain Management Plan				Floodplain Ordinance (Ch. 16.04)
Stormwater Management Plan				Stormwater Mgmt (Ch. 16.28); Napa Countywide Stormwater Pollution Prevention Program; Groundwater Sustainability Plan
Emergency Operations Plan				EOP updated 2024
Climate Action Plan				Regional Climate Action & Adaptation Plan (RCAAP) updated 2025-2026
Climate Vulnerability Assessment				Part of RCAAP updated 2025-2026

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Planning and Regulatory Capabilities				
Urban Greening Plan				Addressed in RCAAP updated 2025-2026
Ground Water Management Planning / Plans				Stormwater Mgmt (Ch. 16.28); Groundwater Sustainability Plan
National Flood Protection Program (NFIP)				
Floodplain Management Regulations				Floodplain Ordinance (Ch. 16.04) exceeds minimum NFIP standards
Flood Insurance Education and Technical Assist.				Provided via County website (FAQs, insurance info, staff contacts)
Flood Insurance Study				FEMA FIS adopted 2016
Elevation Certificates				Reviewed and kept by Engineering Division of Planning, Building & Environmental Services (PBES) Department
Flood Hazard Mapping / Re-Mapping				FEMA FIRMs adopted 2008-2016
Community Rating System (CRS)				Class 7; participating since 2018
Administrative and Technical				
Community Planning and Development Services				
Community Planner				PBES Dept, Planning Division staff
Planner/Engineer (Land Development)				PBES Dept, Planning and Engineering Divisions staff
Engineer/Professional (Construction)				Public Works Dept staff
Planner/Engineer/Scientist (Natural Hazards)				PBES Dept, Planning and Engineering Divisions staff
Transportation Planner				Public Works Dept staff
Resiliency Planner				PBES Dept, Conservation and Natural Resources Divisions staff
Building Code Official (Full time or Augmented)				PBES Dept, Building Division staff
Floodplain Administrator				PBES Dept Director and staff
Fire Marshal				Fire Dept staff
Dedicated Public Outreach Personnel				No dedicated staff; duties performed as needed across all departments
GIS Specialist and Capability				PBES Dept GIS staff
Emergency Manager				Sheriff's Office of Emergency Services (OES) staff
Dedicated Grant Manager, Writer, or Specialist				No dedicated staff; duties performed as needed across all departments

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Planning and Regulatory Capabilities				
Other	N/A	N/A	N/A	
Warning Systems/Services				
General				ALERT Napa County, WEA and IPAWS
Flood				ALERT Napa County, WEA and IPAWS
Tornado				ALERT Napa County, WEA and IPAWS
Wildfire				ALERT Napa County, WEA and IPAWS
Geological Hazards				ALERT Napa County, WEA and IPAWS
Fiscal Capabilities				
Financial Resources for Hazard Mitigation				
Levy Taxes for Specific Purposes				May levy special taxes with voter approval
Utilities Fees	N/A	N/A	N/A	Not a utility provider
Benefit assessments				Limited use (e.g., Flood Control and Water Conservation District)
Community Development Block Grants				Receives CDBG funds for infrastructure and resilience improvements
System Development Fee				Imposed on new development for capital needs
General Obligation Bonds to Incur Debt				Used selectively due to debt limits and voter threshold
Special Tax Bonds to Incur Debt				Rarely used directly; future opportunity in partnership with special districts for mitigation projects
Withheld Spending in Hazard-Prone Areas				No formal policy; future opportunity
Stormwater Service Fees				Imposed on new development
Capital Improvement Project Funding				5-year CIP funds
Education / Outreach Capabilities				
Education/Outreach Resources				
Website Dedicated to Hazard Topics				Ready Napa County
Dedicated Social Media				County and OES social media (Facebook, Instagram, YouTube, etc.)
Local Citizen Groups That Communicate Hazard Risks				Firewise, CERT
Hazard Info. Avail. at Library/ Planning Desk				PBES Dept and OES websites and staff

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Planning and Regulatory Capabilities				
Annual Public Safety Events				Hosted by Fire Dept and OES
Ability to Field Public Tech. Assistance Requests				OES and PBES, Fire, and Public Works Depts
Public Safety Newsletters or Printed Outreach				Printed materials limited, but online resources widely available
Community Emergency Response Team (CERT)				Active CERT and regular training
Fire Safe Councils				Napa Communities Firesafe Foundation consists of 23 FSCs
Firewise				18 Firewise communities
StormReady				Not designated; future opportunity
Resource Conservation Districts				Napa County RCD
Other	N/A	N/A	N/A	

4.2.3 Funding Opportunities

The federal, state, and local funding opportunities listed in Table 4-2 are provided as potential options to leverage and increase the capabilities and adaptive capacities of Napa County and the other participating jurisdictions. This includes the FEMA Hazard Mitigation Assistance (HMA) grant program as well as other national and state programs and grants. Note that this list serves as a resource and is not exclusive or exhaustive.

Table 4-2: Federal, State, and Local Funding Opportunities

Agency / Program Name	Potential Programs / Grants
Federal Funding Opportunities	
FEMA HMA and Other Programs	FEMA HMA grant programs include: ▪ Hazard Mitigation Grant Program (HMGP): fema.gov/hazard-mitigation-grant-program ▪ Building Resilient Infrastructure and Communities (BRIC)* Program: fema.gov/grants/mitigation/building-resilient-infrastructure-communities ▪ Flood Mitigation Assistance (FMA) Program: fema.gov/flood-mitigation-assistance-grant-program For more information on current HMA grants visit fema.gov/hazard-mitigation-assistance

Agency / Program Name	Potential Programs / Grants
	Assistance to Firefighters Grant (AFG) Program: Grants for firefighting resources, fire prevention and safety, and staffing for adequate response. fema.gov/welcome-assistance-firefighters-grant-program
	Fire Prevention and Safety (FP&S) Program: Grants to enhance the safety of the public and firefighters and administered as part of the AFG Program. FP&S Grants are offered to support projects that cover fire prevention and safety activities and research and development activities. fema.gov/fire-prevention-safety-grants
	Emergency Management Performance Grants (EMPG): Grants for equipment such as backup generators. fema.gov/emergency-management-performance-grant-program
	Regional Catastrophic Preparedness Grant Program (RCPGP): Grants for housing, logistics, and supply chain management encouraging innovative regional solutions to issues related to catastrophic incidents. fema.gov/regional-catastrophic-preparedness-grant-program
	The Flood Mitigation Assistance Swift Current (Swift Current) effort provides funding to mitigate buildings insured through the NFIP after a major disaster declaration following a flood-related disaster event to reduce risk against future flood damage. fema.gov/grants/mitigation/learn/flood-mitigation-assistance/swift-current
Office of State and Community Energy Programs (SCEP)	The Office of State and Community Energy Programs (SCEP) is part of a concerted effort at the DOE to extend the capacity and capability of states, tribes, local governments, schools, and community-serving organizations to implement high-impact, self-sustaining clean energy projects that center the needs of low-income and disadvantaged communities. SCEP does this through the management and oversight of over $16 billion in formula grants, competitive grant awards, consumer rebate grants, and technical assistance. energy.gov/scep/office-state-and-community-energy-programs
U.S. Department of Agriculture (USDA) Programs	USDA offers a variety of programs to help farmers, ranchers, communities, and businesses that have been hard hit by natural disaster events. Available FSA programs; are available at farmers.gov. For additional USDA programs visit: fsa.usda.gov/programs-and-services/disaster-assistance-program
U.S. Bureau of Reclamation (BOR) Programs	BOR has annual funding available through the WaterSMART grant program, including for Water Reclamation and Reuse, Drought Resiliency Project, and Water and Energy Efficiency Grant. usbr.gov/watersmart/
State Funding Opportunities	

Agency / Program Name	Potential Programs / Grants
California Department of Housing and Community Development (HCD) Programs	Community Development Block Grants (CDBG) include: ▪ Community Development (CD) ▪ Economic Development (ED) ▪ Neighborhood Stabilization Program (NSP) ▪ Disaster Recovery Initiative (DRI) ▪ Emergency Solutions Grant (ESG) Program: Funds projects that serve homeless individuals and families with emergency housing and supportive services or that provide homelessness prevention assistance. The Homeless Emergency Assistance and Rapid Transition to Housing (HEARTH) Act of 2009 places new emphasis on assisting people to quickly regain stability in permanent housing after experiencing a housing crisis or homelessness. For more information on current grants visit hcd.ca.gov/grants-and-funding
California Governor's Office of Emergency Services (Cal OES) Programs	Get notified via email when a new Competitive Funding Opportunity (CFO) or Public Meeting Notice is released: Join the Cal OES Grants Management Mailing List Search for active Cal OES grant programs here: caloes.ca.gov/office-of-the-director/policy-administration/finance-administration/grants-management/search-for-grants/
California Department of Forestry and Fire Protection (CAL FIRE)	Wildfire Prevention and Forest Health Grants: Supports CWPPs and collaborative wildfire risk reduction. fire.ca.gov/what-we-do/grants
California Water Resources Control Board Programs	The Division of Financial Assistance (DFA) has the lead in administering the State Water Resources Control Board's financial assistance programs. These programs include loan and grant funding for construction of drinking water treatment and distribution systems, municipal sewage conveyance and treatment systems; water recycling facilities; remediation for underground storage tank releases and groundwater contamination; technical assistance for small communities; nonpoint source pollution control projects; interim water, and operation and maintenance/Administrator support for small, disadvantaged community water systems; and drought support for individual households. DFA coordinates closely with the Division of Administrative Services, Office of Chief Counsel, Division of Drinking Water, Division of Water Quality, and the Regional Water Quality Control Board, as well as other State, federal, local, and non-governmental organizational partners. DFA administers the Operator Certification Program, which oversees the certification of all wastewater treatment plant and drinking water treatment plant and distribution system operators in California. For more information visit: waterboards.ca.gov/water_issues/programs/grants_loans/

Agency / Program Name	Potential Programs / Grants
California Department of Transportation (CalTrans) Programs	Caltrans' Local Assistance Program oversees more than one billion dollars annually available to over 600 cities, counties and regional agencies for the purpose of improving their transportation infrastructure or providing transportation services. This funding comes from various Federal and State programs specifically designed to assist the transportation needs of local agencies. Annually, over 1,200 new projects are authorized through the Local Assistance Program of which approximately 700 are construction projects. dot.ca.gov/programs/local-assistance
California Community Emergency Response Team (CERT) Program Manager Course	There are over 450 CERT programs in California. The State CERT Administrator provides technical support and CERT updates to programs in California. caloes.ca.gov/office-of-the-director/operations/planning-preparedness-prevention/community-emergency-response-team/
California Residential Mitigation Program	The California Residential Mitigation Program (CRMP): Established to carry out mitigation programs to assist California homeowners who wish to seismically retrofit their houses. californiaresidentialmitigationprogram.com/ ▪ Earthquake Brace + Bolt (EBB) Program: Developed as part of the CRMP to help homeowners lessen the potential for damage to their houses during an earthquake by offering eligible homeowners up to a $3,000 incentive to seismically retrofit their homes. earthquakebracebolt.com/
California Air Resources Board (CARB) Incentives, Grants, and Credit Programs	These programs have hundreds of millions of dollars in grants available over the next several years to reduce emissions from on- and off-road vehicles and equipment. arb.ca.gov/ba/fininfo.htm
California Department of Water Resources (DWR) Grants and Loans	Agency offers a variety of grants and loans related to integrated regional water management, flood mitigation, water conservation and efficiency, environmental restoration, groundwater, water quality, and water supply. water.ca.gov/Work-With-Us/Grants-And-Loans
California Department of Conservation (DOC)	Funds projects that improve soil, water, and habitat conservation at the local level. conservation.ca.gov/information-for/funding-grants-easements
California State Coastal Conservancy	Provides support for nature-based solutions, shoreline protection, and community resilience. scc.ca.gov/grants/
2024 Climate Bond (Proposition 4)	Voters passed the 2024 Climate Bond (Proposition 4) in November 2024, a general obligation bond that will yield $10 billion for a variety of climate resilience efforts, including flood, wildfire, coastal, watershed, water supply, and natural resource management programs. resources.ca.gov/Bonds-Oversight/Proposition-4-Climate-Bond

*Notes: *If reinstated; BRIC funds were not allocated for 2025*

4.3 Translating Strategy to Action

As detailed in Section 4.5, the mitigation actions in this 2026 MJHMP are organized into FEMA's six broad categories, which provide a consistent framework for identifying, evaluating, and prioritizing hazard reduction efforts. These categories include Prevention (PRV), Property Protection (PPRO), Public Education and Awareness (PEA), Natural Resource Protection (NRP), Emergency Services (ES), and Structural Projects (SP). Together, they capture the full range of strategies available to reduce hazard risks in Napa County.

Proposed mitigation actions align with these categories, highlighting both the diversity of approaches and the emphasis on solutions that provide multiple community benefits. This framework ensures that limited resources are directed toward the actions with the greatest potential to reduce risk and strengthen long-term resilience.



Figure 4-1: FEMA's Six Mitigation Action Categories

Integrating Public Input

As detailed in Section 2.1.2, public participation played a central role in shaping the mitigation action plan by ensuring that the strategies and actions reflect the needs, concerns, and priorities of residents across Napa County. Through the online survey, public outreach, and stakeholder engagement, community members identified both the types of mitigation projects they value most and the barriers they face in taking action themselves.

Survey results show strong public demand for investments that improve safety, infrastructure resilience, and long-term community preparedness. The most frequently requested actions included improving the damage resistance of utility infrastructure, upgrading bridges and roadways (including evacuation routes), conducting more vegetation management, and ensuring reliable backup power for critical facilities and emergency operations. Additional high priorities were retrofitting and strengthening critical facilities and increasing property owner assistance for hazard mitigation. These findings directly informed the development of county-wide and jurisdiction-specific mitigation actions, ensuring that the final plan addresses the most urgent community needs.

At the same time, the survey highlighted key barriers that prevent residents from advancing mitigation on their own. The most significant challenge was a lack of funding, followed by needs for more information on where to start and physical labor assistance. There were also a significant number of responses (approximately one-quarter) that perceived their property risk as too low to warrant mitigation. Recognizing these constraints, the mitigation strategies and action plans emphasize solutions that provide increased property owner mitigation assistance, shared benefits at the community-scale, and robust public education and outreach.

Other key findings among the comments collected and incorporated into the MJHMP throughout the planning process include:

- Wildfire is perceived as the highest threat, followed by drought, extreme heat, and earthquake; dam and slope failure are perceived as the lowest threats.
- Most survey respondents (about 85%) believe their property is vulnerable to damage from a natural disaster
- Over 20% of survey respondents do not feel that their household or business is prepared for an emergency evacuation.
- The most common mitigation actions community members have taken to reduce their property risk are purchasing insurance, installing low-flow plumbing fixtures, and modifying vegetation for drought tolerance or defensible space.
- Renters experience additional barriers in mitigating their homes and feel that hazard risks are beyond their control to address.

By integrating community input with technical risk assessment and planning team expertise, the Mitigation Action Plan prioritizes actions that not only reduce hazard exposure but also respond directly to the challenges residents experience. This approach ensures that mitigation is both technically sound and socially responsive, aligning limited resources with the areas of highest public concern and need.

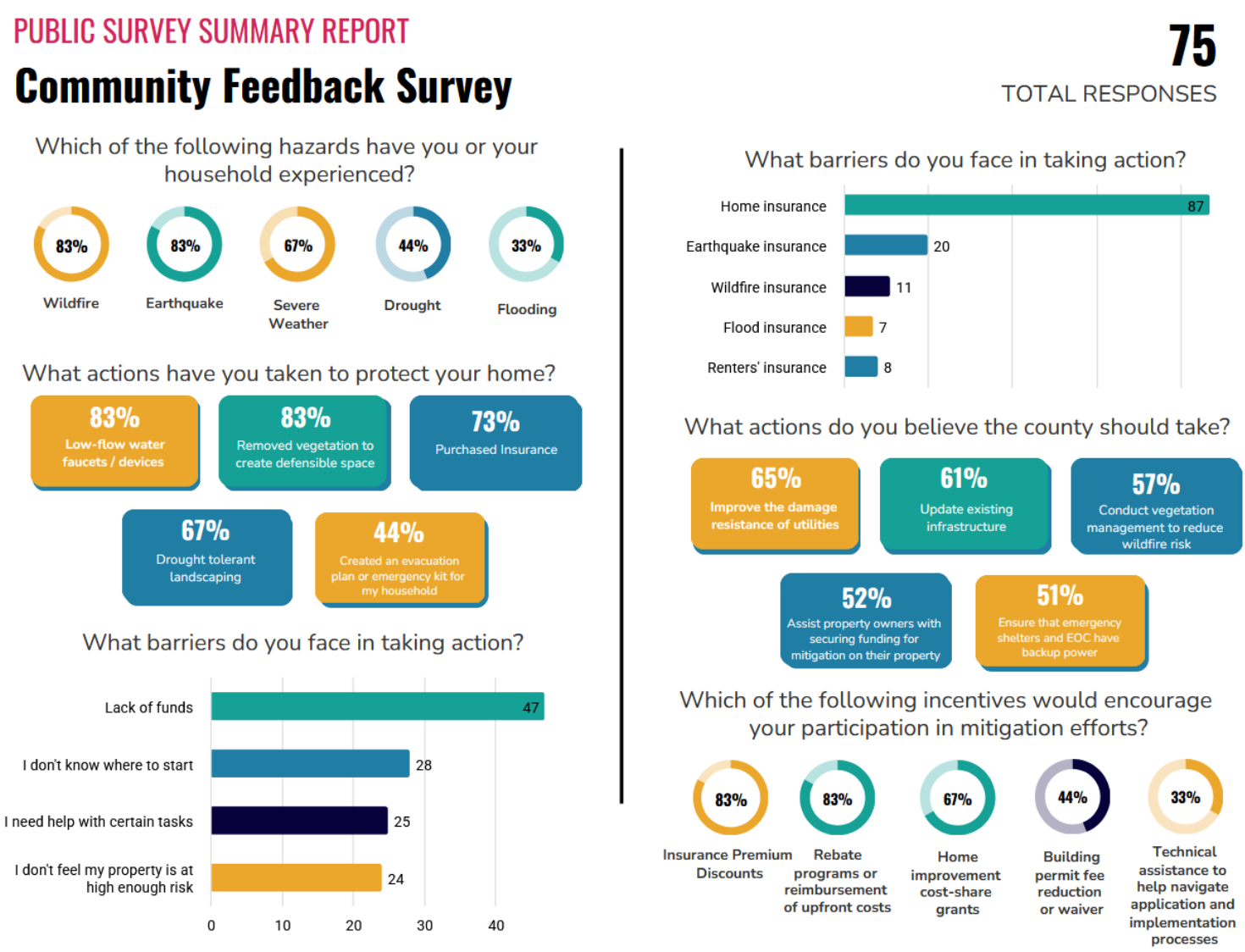


Figure 4-2: Public Survey Summary

Action Prioritization

Mitigation actions in the 2026 MJHMP were prioritized based on anticipated risk reduction, alignment with current capabilities and mitigation strategies, furtherance of equitable and multi-benefit outcomes, and collaboration opportunities. Those actions which address the highest priority or multiple hazards with positive cost/benefit ratios and are less reliant on competitive funding sources were given preference, while actions that reliant on substantial investments in capacity-building or on securing outside funding from limited sources were typically given lower priority.

Action priority was ranked on a scale of low to very high and were evaluated against three basic criteria:

- **Hazard Risk:** Actions that address hazards ranked as extreme or high in the jurisdiction's Risk Matrix were prioritized over those rated as medium or low threats.
- **Alignment with Existing Efforts:** Actions that already align with existing resilience strategies and jurisdictional capabilities and are attainable faster, cheaper, or with less reliance on external inputs were increased in priority.
- **Equitable and Multi-Benefit Outcomes:** Actions that provide multiple community benefits (ecological, social, and economic), address multiple hazard problems, or that can help reduce disparities, improve conditions in disadvantaged communities, or address the needs of vulnerable populations were increased in priority.

This framework ensures that the highest priority actions are realistically achievable during the next five years, reduce hazard risks from the most pressing threats, support or are supported by existing resilience strategies, advance mitigation equitably, and provide multiple benefits. In addition, collaboration opportunities were considered in ranking mitigation actions, further prioritizing those that address cross-cutting challenges through shared efforts as discussed in Section 4.4.

4.4 County-Wide Mitigation Strategy

In recognizing that hazards do not distinguish jurisdictional boundaries and resource limitations, the Steering Group and HMPT determined that a coordinated, county-wide mitigation strategy was needed to address cross-cutting challenges. The County-Wide Mitigation Action Plan (Table 4-3) establishes a unified strategy for reducing risk across all participating jurisdictions. While each jurisdiction faces its own hazards and sets local priorities, many risks overlap and require county-wide coordination to address effectively.

The county-wide mitigation strategy emphasizes actions that strengthen resilience across the entire county, build on local capabilities, and leverage inter-jurisdictional and regional collaboration to overcome cross-cutting hazard problems with shared benefits. This framework ensures that county-wide challenges are met with consistent, equitable, and coordinated solutions.

Figure 4-3 illustrates the shared mitigation strategy concept, showing how the plan builds on the individual efforts and strengths of each participating jurisdiction to address shared hazard risks. The strategy and action plan were developed by the county-wide Planning Team through the comprehensive planning process described in Section 2.

All actions presented in the county-wide action plan are High Priority.

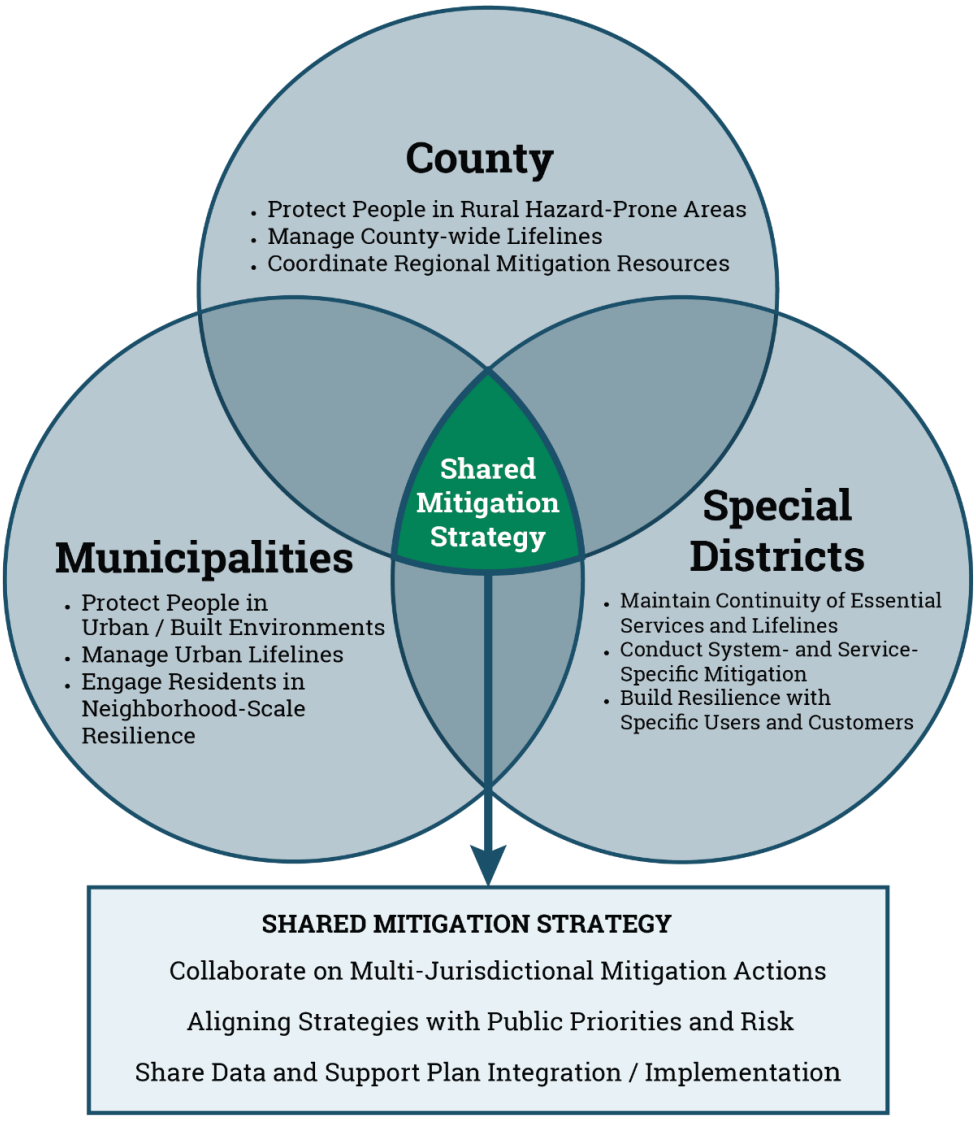


Figure 4-3: County-Wide Mitigation Strategy Diagram

Table 4-3: County-Wide Mitigation Action Plan

Hazard	Key Partners	Action Title / ID	Description	Mitigation Alternative(s)
All Hazard	**All Jurisdictions**	Coordinated County-Wide Outreach Strategy - ma-AH-CW-01	In collaboration with all MJHMP planning partners, coordinate a county-wide outreach strategy to enhance public education and awareness of hazard risks and mitigation actions through consistent, aligned messaging. Efforts should leverage trusted voices and existing networks to reach diverse communities, using inclusive, multilingual, and accessible materials delivered across a variety of platforms. Develop a suite of ready-to-use outreach resources and tools that can be tailored to specific audiences and jurisdictions to promote sustained engagement and shared understanding of local hazards and mitigation opportunities.	PE&A
All Hazard	**County, Municipalities, ACFPD & NCOE**	Shelter & Evacuation Network - ma-AH-CW-02	In collaboration with municipal planning partners and CBOs, identify and retrofit public and private facilities, such as libraries and community centers, to serve as accessible, low-barrier emergency shelters and cooling centers with options for pets. Upgrades may include backup power; HVAC, air filtration, and air conditioning systems; ADA compliance; and capacity to operate during heat, cold, smoke, wildfire, severe weather, and other hazard events while supporting community outreach and emergency response operations. Also improve evacuation routes and support networks to assist vulnerable populations such as seniors and those with disabilities.	SP, PPRO, ES
All Hazard	**All Jurisdictions**	County-Wide Power Resilience - ma-AH-CW-03	In collaboration with all MJHMP planning partners and PG&E, construct power redundancy improvements including emergency interties, microgrid installations, backup generators or renewable generation sources, battery storage, and other improvements for critical facilities and infrastructure across the county.	SP, PPRO, ES

Hazard	Key Partners	Action Title / ID	Description	Mitigation Alternative(s)
Wildfire	**County, Municipalities, ACFPD, NCOE, NapaSan & Howell Mountain**	Coordinated Wildfire Mitigation - ma-WF-CW-04	In collaboration with regional wildfire planning partners, implement priority fuel management, forest health, and watershed protection projects on public and private lands through partnerships among local, regional, state, and private entities, in alignment with the CWPP. Projects should advance shared forest health and wildfire risk reduction priorities to achieve landscape-scale resilience outcomes by leveraging cross-jurisdictional coordination, shared resources, and community outreach and education.	NRP, PE&A
Drought	**County, Municipalities, NapaSan, NCOE & Howell Mountain**	Coordinated Drought Mitigation - ma-DR-CW-05	In collaboration with regional water service and planning partners, plan for and develop alternative water supplies and system redundancy improvements, such as stormwater catchment infrastructure, groundwater recharge basins, recycling systems, and emergency interties. Coordinate public outreach and education efforts to align messaging and improve water conservation.	PRV, PE&A, NRP, SP
Flood, Severe Weather (Heavy Rain), & Climate Change (Sea Level Rise)	**County, NCFCWCD, City of Napa, City of American Canyon, NCOE & NapaSan**	Coordinate Flood & Sea Level Rise Mitigation - ma-FL-CW-06	In collaboration with regional floodplain management and coastal planning partners, complete re-mapping of flood and sea level rise hazards and conduct additional mitigation projects for flood-prone areas, infrastructure, and structures exposed to SLR or not already receiving protection from Measure "A" Flood Project. Mitigation projects should include bridge, culvert, and other drainage and flood control improvements through a combination of structural and nature-based solutions.	PRV, SP, PPRO, NRP

4.5 Mitigation Action Plan

The Mitigation Action Plan is the roadmap for reducing hazard risk and strengthening resilience across Napa County and all participating jurisdictions. It translates the county-wide goals, range of mitigation alternatives, and prioritization framework into a set of actionable steps designed to safeguard people, property, infrastructure, and natural systems.

The actions in the county-wide plan (Table 4-3), Napa County plan (Table 4-4), and those in Volume 2 annexes are the product of a structured process that combined data from the risk assessment, input from planning partners and stakeholders, and a prioritization framework designed to ensure accountability and transparency. Each action was evaluated against prioritization factors presented previously and accompanied by key details to guide implementation and accountability:

- **Timeline:** Short-term, medium-term, or long-term implementation schedule.
- **Responsibility:** The lead agency or department and supporting partners.
- **Cost/Benefit Review:** A qualitative review of relative costs and benefits. Actions with benefits equal to or greater than their costs are considered cost-beneficial.
  - Cost: Low (fundable under existing budget), Medium (requires budget adjustment or multi-year allocation), or High (requires new funding source such as grants or bonds).
  - Benefit: Low (difficult to quantify in short-term), Medium (provides long-term benefits or immediate property risk reduction), or High (provides immediate life-safety and property protection).
- **Potential Funding Sources:** Local resources such as general funds or dedicated fees, as well as state or federal funding sources, including FEMA HMA programs and Cal OES grants.

Together, these elements ensure that the Mitigation Action Plan is not just a list of projects but a carefully prioritized and actionable strategy. By balancing readiness, cost-effectiveness, equity, and strategic alignment, the plan provides a clear pathway for jurisdictions to reduce risk while maximizing co-benefits and shared investment.

Important Note: Recognizing that new needs and priorities may arise as a result of a disaster or other circumstances, the MJHMP partners reserve the right to support new and edit existing actions as necessary, so long as the actions conform to the overall goals of this plan.

Mitigation Action Identification

Each mitigation action in this MJHMP is assigned a unique identification number using alphanumeric characters that denote specific attributes, as illustrated in Figure 4-4. These attributes include the type of hazard being mitigated (e.g., WF for wildfire), an abbreviation for the responsible jurisdiction, and a number to facilitate easy reference and management.

In addition, the mitigation actions encompass both newly developed actions for this plan update and existing actions carried over from previous hazard mitigation plans that were yet to be completed or needed refinement. This is reflected in the identification information for each action as “new” or “existing.”

Problem statements are similarly assigned a unique identification number, except that instead of beginning with "ma" for mitigation action, they begin with "ps" for problem statement. Problem statements for Napa County are found in the hazard profiles of the risk assessment in Volume 1 (Section 3), and statements for other participating jurisdictions are found in Volume 2.

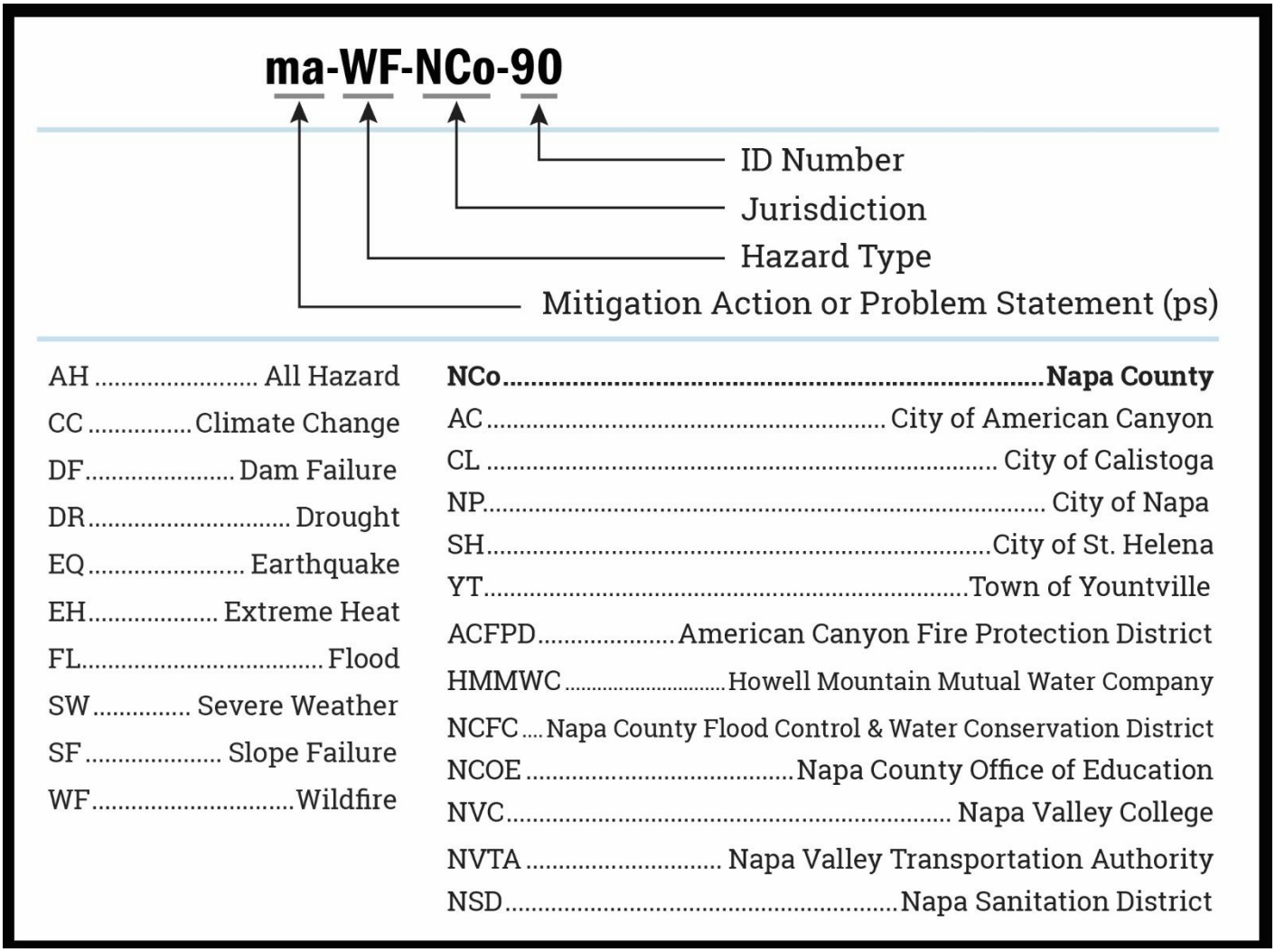


Figure 4-4: Mitigation Action Number Key

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Table 4-4: Napa County Mitigation Action Plan

Mitigation No.	Hazard Type	Sub-Hazard	Mitigation Type	Year	Primary Agency	Title	Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Problem Statements
ma-AH-NCo-4	All Hazard		PPRO - Property Protection , SP - Structural Projects	2020	Napa County	Power Resilience Improvements	Construct or install backup power generators or renewable generation sources, batteries, and other power redundancy improvements for public safety buildings and critical facilities like fire stations, pump houses, emergency shelters, cooling centers, and backup Emergency Command Center locations.	Office of Emergency Services	High	High	5-10 Years	Project	HMGP / BRIC , General Fund	Medium	ps-EQ-NCo-64, ps-EQ-NCo-56, ps-EQ-YT-72, ps-EQ-NCo-62, ps-EQ-NCo-78, ps-EQ-NCo-77, ps-FL-NCo-129, ps-EH-NCo-3, ps-EH-NCo-10, ps-SW-NCo-144, ps-SW-NCo-391, ps-SW-NCo-393, ps-SW-NCo-394, ps-WF-NCo-154
ma-AH-NCo-6	All Hazard		PE&A - Public Education & Awareness	2020	Napa County	Comprehensive All-Hazard Outreach Program	In collaboration with municipalities and other local and regional jurisdictions, coordinate and develop a comprehensive, county-wide outreach strategy to enhance public education and awareness of hazard risks and mitigation actions through consistent, aligned messaging. Efforts should leverage trusted voices and existing networks to reach diverse communities, using inclusive, multilingual, and accessible materials delivered across a variety of platforms and addressing all priority natural hazards, including wildfire, flood, drought, earthquake, severe weather, extreme heat, dam failure, slope failure, and climate change. Develop annual campaigns (e.g., Natural Hazard Awareness Week, earthquake or flood education month, 72-hour kits) and a suite of ready-to-use outreach resources and tools that can be tailored to specific audiences and jurisdictions to promote sustained engagement and shared understanding of local hazards and mitigation opportunities.	Office of Emergency Services	Medium	Medium	3-5 Years	Capacity / Capability Building	HMGP / BRIC , General Fund , CalFIRE	High	ps-FL-NVC-126, ps-FL-NVC-127, ps-FL-NCo-128, ps-DF-NCo-385, ps-DF-NCo-387, ps-DR-NCo-389, ps-EQ-NCo-58, ps-EQ-NCo-62, ps-FL-NCo-395, ps-EH-NCo-3, ps-EH-NCo-10, ps-EH-NCo-390, ps-SW-NCo-391, ps-SF-NCo-151, ps-WF-NCo-155, ps-WF-NCo-156
ma-AH-NCo-15	All Hazard		PPRO - Property Protection , PE&A - Public Education & Awareness , ES - Emergency Services	2020	Napa County	Enhance County-Wide Shelter Network	In collaboration with municipalities and other local partners, identify and retrofit county-, public agency-, and CBO-owned facilities, such as libraries and other community centers, to serve as accessible, low-barrier all-hazard shelters with options for pets. Upgrades may include backup power, HVAC and air filtration systems, ADA compliance improvements, and capacity to operate during heat, cold, smoke, wildfire, and other severe weather or hazard events, while supporting community outreach and emergency response operations.	Office of Emergency Services	High	High	3-5 Years	Capacity / Capability Building	HMGP / BRIC , General Fund	High	ps-EH-NCo-3, ps-WF-NCo-164, ps-WF-NCo-14, ps-SW-NCo-144, ps-EH-NCo-390, ps-EQ-NCo-56, ps-DF-NCo-387
ma-AH-NCo-26	All Hazard		PRV - Prevention	2020	Napa County	All-Hazard Development Regulations Update	Adopt and enforce updated building and development codes to reduce hazard risks to people, property, and environmental resources, including strengthening standards and enforcement for earthquake safety, water conservation, stormwater management, slope stabilization and erosion control, and protections from other natural hazards. (Consider timing update with other code changes for flood, SLR, and wildfire resilience.)	Building, Planning & Environmental Services Department	Low	Medium	1-3 Years	Capacity / Capability Building	HMGP / BRIC , General Fund	Medium	ps-CC-NCo-11, ps-CC-NCo-4, ps-DF-NCo-385, ps-DR-NCo-41, ps-EQ-NCo-58, ps-EQ-NCo-56, ps-EQ-NCo-392, ps-FL-NCo-117, ps-FL-NCo-395, ps-EH-NCo-10, ps-SW-NCo-130, ps-SF-NCo-151, ps-WF-NCo-155

Mitigation No.	Hazard Type	Sub-Hazard	Mitigation Type	Year	Primary Agency	Title	Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Problem Statements
ma-CC-NCo-1	Climate Change	Agricultural Impacts	PRV - Prevention , PE&A - Public Education & Awareness	2020	Napa County	Agricultural Sector Vulnerability Assessment, Disaster Planning & Training	In collaboration with local farmers and wineries, conduct a climate change risk assessment for the agricultural industry and develop mitigation strategies that support disaster management at the local levels. Provide agricultural disaster training and networking opportunities for farmers and agricultural regulatory agencies.	Agricultural Commissioner's Office	Low	Medium	1-3 Years	Capacity / Capability Building	Internal Funding	High	ps-CC-NCo-0, ps-CC-NCo-1, ps-CC-NCo-7, ps-DR-NCo-388, ps-DR-NCo-389, ps-EH-NCo-9, ps-EH-NCo-390, ps-SW-NCo-393, ps-WF-NCo-14
ma-CC-NCo-13	Climate Change	Sea Level Rise	PRV - Prevention , PPRO - Property Protection	2020	Napa County	Sea Level Rise Assessment & Code Update	In collaboration with ABAG, DWR, and other regional partners, conduct a sea level rise assessment update that integrates the best available data and modeling, with consideration of recent flood mitigation projects and tidal influences. Adopt updated and new development standards based on the assessment to help protect and mitigate the long-term impacts of sea level rise and other climate change-driven shoreline hazards (e.g., tidal flooding, erosion, storm surge).	Public Works Department, Planning, Building & Environmental Services Department	Medium	Medium	3-5 Years	Project	HMGP / BRIC , General Fund	Medium	ps-CC-NCo-4, ps-CC-NCo-6, ps-CC-NCo-7, ps-FL-NCo-395, ps-FL-NCo-117, ps-SW-NCo-130
ma-DF-NCo-55	Dam Failure		PRV - Prevention , ES - Emergency Services	2020	Napa County	Dam Failure Assessment & Warning System	Update and improve risk assessments for high hazard and poor condition dams that threaten county populations, properties, facilities, or infrastructure, and construct, install, and maintain warning gauges on high-priority dams as the opportunity or need arises. Design and implement a county-wide dam failure warning system in collaboration with other jurisdictions, dam owners/operators, and state and regional partners to improve warning procedures and time for everyone within a dam inundation zone, especially those located in areas at risk of cascading failures.	Office of Emergency Services, Public Works Department	High	Medium	3-5 Years	Capacity / Capability Building	HMGP / BRIC , General Fund	Medium	ps-DF-CL-24, ps-DF-NCo-25, ps-DF-CL-26, ps-DF-NVC-28, ps-DF-YT-29, ps-DF-YT-30, ps-DF-NCOE-31, ps-DF-AC-32, ps-DF-AC-33, ps-FL-NCo-110, ps-FL-YT-114, ps-DF-NCo-384, ps-DF-NCo-385, ps-DF-NCo-386, ps-DF-NCo-387
ma-DR-NCo-18	Drought		NRP - Natural Resource Protection , SP - Structural Projects	2020	Napa County	Water Supply Redundancy Improvements	Develop alternative water supplies to augment single sources of water delivery, work with partner agencies to install emergency interties, and construct groundwater recharge infrastructure (e.g., rainwater catchment systems, recharge basins).	Public Works Department	High	High	5-10 Years	Project	HMGP / BRIC , General Fund	High	ps-CC-NCo-11, ps-CC-NCo-1, ps-DR-NCo-41, ps-DR-NCo-388, ps-DR-NCo-389
ma-DR-NCo-24	Drought		PPRO - Property Protection , NRP - Natural Resource Protection	2020	Napa County	Water Efficiency Improvements	Conduct water efficiency improvements for county properties and facilities, including replacing and installing new landscaping for drought tolerance, auditing water usage, and installing/upgrading irrigation and plumbing fixtures to reduce waste.	Public Works Department	High	High	3-5 Years	Project	HMGP / BRIC , General Fund	High	ps-DR-NCo-41, ps-DR-AC-42, ps-DR-CL-45, ps-DR-NCOE-44, ps-DR-NCo-389
ma-EQ-NCo-37	Earthquake		PPRO - Property Protection , PE&A - Public Education & Awareness	2020	Napa County	Earthquake Hardening Assistance Program	Encourage privately owned critical and large-capacity facilities (e.g. houses of worship, hotels, other gathering facilities) to conduct seismic evaluations and needed retrofits. Conduct targeted outreach and develop a technical assistance program to guide property owners through the process. Provide retrofit incentives as feasible.	Building, Planning & Environmental Services Department	Medium	High	3-5 Years	Capacity / Capability Building	HMGP / BRIC , General Fund	Medium	ps-EQ-NCo-58, ps-EQ-NCo-62, ps-EQ-NCo-63, ps-EQ-NCo-56, ps-EQ-NCo-57, ps-EQ-NCo-392

Mitigation No.	Hazard Type	Sub-Hazard	Mitigation Type	Year	Primary Agency	Title	Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Problem Statements
ma-EQ-NCo-38	Earthquake		PPRO - Property Protection , SP - Structural Projects	2020	Napa County	Facilities & Infrastructure Seismic Hardening Projects	Retrofit and harden county-owned critical facilities and infrastructure to increase their ability to withstand earthquakes, including vulnerable water, sewer, natural gas, and transportation lines.	Public Works Department	High	High	5-10 Years	Project	HMGP / BRIC , General Fund	High	ps-EQ-NCo-56, ps-EQ-NCo-57, ps-EQ-NCo-61, ps-EQ-NCo-77, ps-EQ-NCo-60, ps-EQ-NCo-64, ps-EQ-NCo-65, ps-EQ-NCo-392
ma-EH-NCo-16	Extreme Heat		PPRO - Property Protection , PE&A - Public Education & Awareness	2020	Napa County	Extreme Heat Mitigation Assistance Program	Develop an extreme heat mitigation assistance program for seniors, low-income households, and other populations disproportionately vulnerable to heat events, including technical and financial aid for air conditioning installation/replacement, tree planting, and home energy efficiency upgrades.	Housing & Community Services Department	Medium	High	3-5 Years	N/A	HMGP / BRIC , General Fund	Medium	ps-CC-NCo-8, ps-EH-NCo-10, ps-CC-YT-12, ps-EH-NCo-3, ps-EH-NCo-9, ps-EH-NCo-390
ma-FL-NCo-51	Flood		PPRO - Property Protection , NRP - Natural Resource Protection , SP - Structural Projects	2013	Napa County	Flood Hazard Mapping Update & Mitigation Projects	In coordination with NCFCWCD and DWR, complete re-mapping of flood hazards and conduct additional flood mitigation projects for flood-prone areas, infrastructure, and structures not already receiving protection from Measure "A" Flood Project and for Repetitive Loss properties. Mitigation projects should include bridge, culvert, and other drainage and flood control improvements through a combination of structural and nature-based solutions.	Public Works Department, Building, Planning & Environmental Services Department	High	High	3-5 Years	Project	HMGP / BRIC , FMA , General Fund	High	ps-FL-NCFC-103, ps-FL-NCo-119, ps-FL-NCo-129, ps-FL-NCo-395, ps-SW-NCo-130, ps-SW-NCo-144, ps-CC-NCo-4
ma-FL-NCo-52	Flood		PPRO - Property Protection , PE&A - Public Education & Awareness	2020	Napa County	Flood Hazard Education & Assistance program	Develop a flood-specific public outreach and education program that increases participation in the NFIP; informs property owners located in areas exposed to future sea level rise or dam/levee inundation about voluntary flood insurance (preferred risk policies); and increases awareness of public efforts and property owner options to mitigate current and future flood hazards. Develop additional support resources, technical and financial assistance, and incentives for individual property mitigation.	Building, Planning & Environmental Services Department	Medium	High	3-5 Years	Capacity / Capability Building	HMGP / BRIC , FMA , General Fund	High	ps-DF-NCo-25, ps-DF-SH-27, ps-FL-NCo-110
ma-FL-NCo-54	Flood		PRV - Prevention	2020	Napa County	Floodplain Development Standards Update	Update and strengthen the regulations for development in flood-prone areas, including adopting higher standards such as freeboard, flood storage, setbacks and fill restrictions, lower substantial damage or improvement thresholds, and a stream channel ordinance that places drainage maintenance responsibility on property owners with county enforcement power, in support of a no-adverse-impact philosophy and improving the county CRS rating for reduced insurance costs.	Building, Planning & Environmental Services Department	High	High	1-3 Years	Capacity / Capability Building	HMGP / BRIC , General Fund	Medium	ps-FL-NCo-117, ps-CC-NCo-4, ps-CC-NCo-7, ps-DF-NCo-385, ps-FL-NCo-119, ps-FL-NCo-395, ps-FL-NCo-128, ps-SW-NCo-130, ps-SW-NCo-144
ma-FL-NCo-59	Flood		PPRO - Property Protection	2020	Napa County	Farmworker Centers Relocation	Relocate the three farmworker centers exposed to flood risks to areas that are not exposed to hazards or that are effectively mitigated.	Agricultural Commissioner's Office, Housing & Community Services Department	High	High	3-5 Years	Project	HMGP / BRIC , FMA , General Fund	High	ps-FL-NCo-102

Mitigation No.	Hazard Type	Sub-Hazard	Mitigation Type	Year	Primary Agency	Title	Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Problem Statements
ma-SW-NCo-57	Severe Weather	Heavy Rain	PRV - Prevention , PPRO - Property Protection , NRP - Natural Resource Protection	2020	Napa County	Drainage Infrastructure Inventory & Capacity Improvements	In partnership with NCFCWCD, identify, assess, and upgrade undersized culverts and other stormwater infrastructure (e.g., Milton culvert, stormwater basins) to manage high-intensity rainfall under current and future projected conditions, including through nature-based and green infrastructure solutions. Complete an inventory of all publicly-owned stormwater facilities and establish a priority list for replacements and other improvements that account for fish passage, flood depth reduction, sea level rise, tidal influences, and future losses avoided.	Public Works Department	High	High	3-5 Years	Project	HMGP / BRIC , FMA , General Fund	High	ps-FL-NCo-129, ps-CC-NCo-4, ps-CC-NCo-7, ps-DF-NCo-385, ps-FL-NCo-102, ps-FL-NCo-110, ps-FL-NCo-119, ps-FL-NCo-395, ps-SW-NCo-130, ps-SW-NCo-144
ma-SF-NCo-84	Slope Failure		PPRO - Property Protection	2020	Napa County	Slope Failure Risk Mapping & Stabilization Projects	Conduct a county-wide mapping study of high slope failure risk areas, especially near critical assets and along major access routes. Establish a priority list of slope failure locations and implement slope stabilization projects in the highest risk areas.	Public Works Department	High	High	3-5 Years	Project	HMGP / BRIC , General Fund	Low	ps-SF-NCo-151, ps-SF-NCo-152, ps-SF-NCo-396
ma-SF-NCo-85	Slope Failure		PPRO - Property Protection	2020	Napa County	Angwin VFD Protections	Construct a slope stabilization project to protect the Angwin VFD storage facility.	Fire Department, Public Works Department	Medium	Medium	1-3 Years	Project	N/A	High	ps-SF-NCo-152, ps-SF-NCo-396
ma-WF-NCo-90	Wildfire		PPRO - Property Protection , PE&A - Public Education & Awareness , NRP - Natural Resource Protection , ES - Emergency Services	2020	Napa County	Wildfire Mitigation Assistance Program	Enhance the existing wildfire mitigation assistance program through assistance capacity improvements and additional outreach. Improve technical and financial assistance programs with Napa Firewise for fuel management, access improvements, proper addressing installation, structure hardening, and other mitigation measures. Support efforts by also fostering and forming additional neighborhood-based Firewise Councils through grant writing.	Fire Department	High	High	1-3 Years	N/A	HMGP / BRIC , General Fund , CalFIRE	High	ps-WF-CL-179, ps-WF-NCo-164, ps-WF-NCo-165, ps-WF-NCo-166, ps-WF-NCo-167, ps-WF-NCo-168, ps-WF-NCo-169, ps-WF-NCo-170, ps-WF-AC-173, ps-WF-YT-176, ps-WF-CL-183, ps-WF-NCo-14, ps-WF-NCo-155, ps-WF-NCo-156, ps-WF-NCo-172, ps-WF-NCo-181
ma-WF-NCo-94	Wildfire		PPRO - Property Protection , ES - Emergency Services , SP - Structural Projects	2013	Napa County	Facility & Infrastructure Wildfire Hardening Projects	Retrofit critical facilities and infrastructure with fire resistant materials and other structure hardening methods, improve emergency access and evacuation routes (e.g., Howell Mountain Rd.), create defensible space, and install emergency water supplies in strategic locations. Work with property owners of essential facilities like adult and childcare centers and with utility providers, especially power.	Fire Department, Public Works Department	High	High	5-10 Years	Project	HMGP / BRIC , General Fund , CalFIRE	High	ps-WF-NCo-171, ps-WF-NCOE-178, ps-WF-NVC-180, ps-WF-NCo-14, ps-WF-NCo-153, ps-WF-NCo-154
ma-WF-NCo-95	Wildfire		PRV - Prevention , NRP - Natural Resource Protection	2013	Napa County	Advanced Ignition & Fuel Management Enforcement	Develop an enhanced wildfire education and enforcement program that focused on seasonal vegetation management and weed abatement as well as the human causes of ignition. Address these problems through regular education and outreach and seasonal enforcement actions, including strict property inspection, warning, fining, and cleanup procedures and vigorous prosecution of arson.	Napa County Fire	Medium	Medium	3-5 Years	Capacity / Capability Building	HMGP / BRIC , General Fund , CalFIRE	High	ps-WF-NCo-155, ps-WF-NCo-181, ps-WF-SH-198, ps-WF-NCo-14, ps-WF-NCo-154, ps-WF-NCo-156, ps-WF-NCo-164, ps-WF-NCo-172

Mitigation No.	Hazard Type	Sub-Hazard	Mitigation Type	Year	Primary Agency	Title	Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Problem Statements
ma-WF-NCo-96	Wildfire		NRP - Natural Resource Protection	2020	Napa County	Enhanced Fuel Management Program	Complete vegetation management projects as prescribed in the CWPP, such as shaded fuel breaks, prescribed burns, and roadside treatments, and establish a long-term maintenance program.	Fire Department	Medium	High	3-5 Years	Capacity / Capability Building	HMGP / BRIC , General Fund , CalFIRE	High	ps-WF-NCo-182, ps-WF-NCo-181, ps-WF-NCo-172, ps-WF-NCo-164, ps-WF-NCo-156, ps-WF-NCo-154, ps-WF-NCo-14

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4.6 Status of Previous Mitigation Actions

In 2020, Napa County adopted its previous FEMA-approved MJHMP. This 2026 plan represents a comprehensive update from that previous MJHMP, as discussed in Section 1.5. Table 4-5 provides status updates for all of the previous mitigation actions in Napa County's 2020 MJHMP, from which many of the mitigation actions in Table 4-4 were sourced and revised.

Table 4-5: Status of Previous Napa County Mitigation Actions

Mitigation No.	Hazard Type	Status	Year	Primary Agency	Title/Description	Reason Completed
ma-WF-NCo-91	Wildfire	Completed	2013	Napa County	Develop & conduct a Defensible Space community education program.	Program established through Napa Firewise
ma-WF-NCo-92	Wildfire	Completed	2013	Napa County	Draft & promulgate Defensible Space Ordinance.	Ordinance update completed
ma-AG-NCo-2	Ag Disaster	Cancelled	2020	Napa County	Offer agricultural disaster training and networking opportunities for farmers and ag regulatory agencies.	NC-56-2020, NC-27-2020, NC-57-2020 combined and revised
ma-AH-NCo-5	All Hazard	Cancelled	2020	Napa County	Construct/Install back up power generators for fire stations, pump houses, emergency shelters and cooling centers.	NC-09-2013, NC-11-2020, NC-15-2020 combined and revised
ma-CC-NCo-14	Climate Change	Cancelled	2020	Napa County	Create an outreach plan to inform residents about County efforts to boost resilience to sea-level rise	NC-30-2020, NC-31-2020, NC-21-2020 combined and revised
ma-CC-NCo-17	Climate Change	Cancelled	2020	Napa County	Support risk assessments for the agriculture and wine industries.	NC-56-2020, NC-27-2020, NC-57-2020 combined and revised
ma-CC-NCo-19	Climate Change	Cancelled	2020	Napa County	Construct rainwater catchment systems to recharge groundwater in government ROWs.	NC-28-2020 & NC-29-2020 combined and revised
ma-DF-NCo-120	Dam Failure	Cancelled	2020	Napa County	Develop and implement a County-wide warning system for dam failure, including all HMP jurisdictions as secondary participants.	NC-34-2020, NC-35-2020, NC-200-2020 combined and revised
ma-DR-NCo-23	Drought	Cancelled	2020	Napa County	Develop a public education campaign to encourage water conservation during drought.	NC-32-2020, NC-10-2013, NC-12-2020, NC-13-2020, NC-16-2020 combined and revised
ma-DR-NCo-25	Drought	Cancelled	2020	Napa County	Install drought tolerant landscaping at government-owned facilities.	NC-17-2020 & NC-18-2020 combined and revised

Mitigation No.	Hazard Type	Status	Year	Primary Agency	Title/Description	Reason Completed
ma-DR-NCo-27	Drought	Cancelled	2020	Napa County	Adopt a water conservation ordinance to limit outdoor watering for commercial and residential properties.	NC-22-2020, NC-54-2020, NC-23-2020 combined and revised
ma-EQ-NCo-36	Earthquake	Cancelled	2013	Napa County	Earthquake month public education program. Develop a comprehensive public outreach program for earthquake risk reduction for Napa County Residents.	NC-32-2020, NC-10-2013, NC-12-2020, NC-13-2020, NC-16-2020 combined and revised
ma-EQ-NCo-39	Earthquake	Cancelled	2020	Napa County	Adopt and enforce updated building codes to reduce earthquake damage to structures.	NC-22-2020, NC-54-2020, NC-23-2020 combined and revised
ma-FL-NCo-53	Flood	Cancelled	2020	Napa County	Increase participation in the NFIP.	NC-30-2020, NC-31-2020, NC-21-2020 combined and revised
ma-FL-NCo-56	Flood	Cancelled	2020	Napa County	Improve risk assessments for dams located within the county.	NC-34-2020, NC-35-2020, NC-200-2020 combined and revised
ma-FL-NCo-58	Flood	Cancelled	2020	Napa County	Create an inventory and prioritize culvert replacements, considering fish passage, flood depth reduction, and loss prevention.	NC-37-2020, NC-38-2020, NC-48-2020 combined and revised
ma-FL-NCo-60	Flood	Cancelled	2020	Napa County	Elevate and or retrofit bridges, culverts to allow proper stormwater / 100-YR flows.	NC-01-2013, NC-47-2020, NC-46-2020 combined and revised
ma-FL-NCo-61	Flood	Cancelled	2020	Napa County	Mitigate flood risk to NFIP repetitive loss properties.	NC-01-2013, NC-47-2020, NC-46-2020 combined and revised
ma-FL-NCo-62	Flood	Cancelled	2020	Napa County	Construct / improve stormwater basins County-wide to accomplish 100-YR protection .	NC-37-2020, NC-38-2020, NC-48-2020 combined and revised
ma-FL-NCo-63	Flood	Cancelled	2020	Napa County	Adopt stricter regulatory standards to reduce flood risk and support no-adverse-impact floodplain management.	NC-33-2020, NC-50-2020 combined and revised
ma-PN-NCo-77	Pandemic	Cancelled	2020	Napa County	Increase the capacity of existing hospitals through retrofits or upgrades such as isolation wings.	Pandemic not profiled
ma-PN-NCo-78	Pandemic	Cancelled	2020	Napa County	Retrofit critical care facilities with enhanced HVAC and isolation areas.	Pandemic not profiled
ma-SW-NCo-81	Severe Weather	Cancelled	2020	Napa County	Organize outreach to vulnerable populations, including establishing and promoting accessible shelters in the community.	NC-32-2020, NC-10-2013, NC-12-2020, NC-13-2020, NC-16-2020 combined and revised

Mitigation No.	Hazard Type	Status	Year	Primary Agency	Title/Description	Reason Completed
ma-SW-NCo-82	Severe Weather	Cancelled	2020	Napa County	Develop a public information campaign on 72-hour kits.	NC-32-2020, NC-10-2013, NC-12-2020, NC-13-2020, NC-16-2020 combined and revised
ma-SW-NCo-83	Severe Weather	Cancelled	2020	Napa County	Procure and maintain backup generators for community centers, town halls, and water treatment plants used as Emergency Command Centers.	NC-09-2013, NC-11-2020, NC-15-2020 combined and revised
ma-WF-NCo-93	Wildfire	Cancelled	2013	Napa County	Foster & form neighborhood based Firewise Councils through grant writing.	NC-06-2013, NC-03-2020, NC-53-2020 combined and revised
ma-WF-NCo-97	Wildfire	Cancelled	2020	Napa County	Retrofit care facilities (adult care, child care) with fire-resistant materials and or create defensible space around structures.	NC-07-2013, NC-55-2020, NC-44-2020, NC-58-2020 combined and revised
ma-WF-NCo-98	Wildfire	Cancelled	2020	Napa County	Complete vegetation management projects as prescribed in CWPPs.	NC-19-2020, NC-45-2020, NC-49-2020 combined and revised
ma-WF-NCo-99	Wildfire	Cancelled	2020	Napa County	Construct shaded fuel breaks and complete roadside treatment projects as prescribed in CWPPs.	NC-19-2020, NC-45-2020, NC-49-2020 combined and revised
ma-WF-NCo-100	Wildfire	Cancelled	2020	Napa County	Install proper addressing in rural areas to assist in wildfire emergencies.	NC-06-2013, NC-03-2020, NC-53-2020 combined and revised
ma-WF-NCo-101	Wildfire	Cancelled	2020	Napa County	Work with utility providers to move above ground lines underground.	NC-07-2013, NC-55-2020, NC-44-2020, NC-58-2020 combined and revised
ma-WF-NCo-102	Wildfire	Cancelled	2020	Napa County	Construct or improve egress for wildfire emergencies in wildland urban interface (WUI) areas.	NC-07-2013, NC-55-2020, NC-44-2020, NC-58-2020 combined and revised
ma-AH-NCo-4	All Hazard	Ongoing	2020	Napa County	Power Resilience Improvements	Revised
ma-AH-NCo-6	All Hazard	Ongoing	2020	Napa County	Comprehensive All-Hazard Outreach Program	Revised
ma-CC-NCo-15	All Hazard	Ongoing	2020	Napa County	Enhance County-Wide Shelter Network	Revised
ma-DR-NCo-26	All Hazard	Ongoing	2020	Napa County	All-Hazard Development Regulations Update	Revised
ma-AG-NCo-1	Climate Change	Ongoing	2020	Napa County	Agricultural Sector Vulnerability Assessment, Disaster Planning & Training	Revised
ma-CC-NCo-13	Climate Change	Ongoing	2020	Napa County	Sea Level Rise Assessment & Code Update	Revised
ma-FL-NCo-55	Dam Failure	Ongoing	2020	Napa County	Dam Failure Assessment & Warning System	Revised
ma-CC-NCo-18	Drought	Ongoing	2020	Napa County	Water Supply Redundancy Improvements	Revised

Mitigation No.	Hazard Type	Status	Year	Primary Agency	Title/Description	Reason Completed
ma-DR-NCo-24	Drought	Ongoing	2020	Napa County	Water Efficiency Improvements	Revised
ma-EQ-NCo-37	Earthquake	Ongoing	2020	Napa County	Earthquake Hardening Assistance Program	Revised
ma-EQ-NCo-38	Earthquake	Ongoing	2020	Napa County	Facilities & Infrastructure Seismic Hardening Projects	Revised
ma-FL-NCo-51	Flood	Pending	2013	Napa County	Flood Hazard Mapping Update & Mitigation Projects	Revised
ma-FL-NCo-52	Flood	Ongoing	2020	Napa County	Flood Hazard Education & Assistance program	Revised
ma-FL-NCo-54	Flood	Ongoing	2020	Napa County	Floodplain Development Standards Update	Revised
ma-FL-NCo-59	Flood	Ongoing	2020	Napa County	Farmworker Centers Relocation	Revised
ma-CC-NCo-16	High Heat	Ongoing	2020	Napa County	Extreme Heat Mitigation Assistance Program	Revised
ma-FL-NCo-57	Severe Weather	Ongoing	2020	Napa County	Drainage Infrastructure Inventory & Capacity Improvements	Revised
ma-SF-NCo-84	Slope Failure	Ongoing	2020	Napa County	Slope Failure Risk Mapping & Stabilization Projects	Revised
ma-SF-NCo-85	Slope Failure	Ongoing	2020	Napa County	Angwin VFD Protections	Revised
ma-WF-NCo-90	Wildfire	Ongoing	2020	Napa County	Wildfire Mitigation Assistance Program	Revised
ma-WF-NCo-94	Wildfire	Ongoing	2013	Napa County	Facility & Infrastructure Wildfire Hardening Projects	Revised
ma-WF-NCo-95	Wildfire	Ongoing	2013	Napa County	Advanced Ignition & Fuel Management Enforcement	Revised
ma-WF-NCo-96	Wildfire	Ongoing	2020	Napa County	Enhanced Fuel Management Program	Revised

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Appendix A. Analysis Methodology

NAPA COUNTY

Multi-Jurisdictional Hazard Mitigation Plan

A GIS-based vulnerability assessment was conducted for each of the priority hazards identified by the Planning Committee. Several sources of data are necessary to conduct a vulnerability analysis. This appendix presents an outline of the data inputs, processing steps, and outputs used to create the vulnerability analysis results presented in the Hazard Mitigation Plan. The analysis methodology is presented first, followed by an overview of the analysis data.

A.1. Natural Hazard Exposure

The natural hazard exposure analysis (see C. Natural Hazard Exposure in Figure A- 2) is an inventory of population, parcels, critical facilities, and other assets within each natural hazard area. As shown in Figure A- 1 the presence of a structure inside a natural hazard area (the flood zone in this example) qualifies that structure as exposed to the natural hazard.



Figure A- 1: Hazard Exposure

The total counts of parcels, people, facilities, assets and the sum of values within the planning area which could be exposed to a hazard event is referred to as the “exposure” in this plan. A natural hazards overlay was developed to reflect the combination of many known natural hazard spatial footprints. The spatial overlay method enables summarization of building values, parcel counts, population exposure, and critical facility exposure within a hazard’s geographic extents (see C. Natural Hazard Exposure in Figure A- 2). The input data is used to evaluate exposure for earthquakes, landslides, flooding, dam inundation, wildfire and sea level rise.

A.2. Analysis Data

A.2.1. Assets, Value, and Population

A.2.1.1. Parcels

Parcel and address point GIS data supplemented by the county's assessor roll for important attributes such as building square footage and use code type were used to create a composite data set representing a detailed inventory of building location, values, and construction types countywide. A value of $425/sqft was used as an estimate for building replacement cost. Special precautions were taken to avoid duplicating costs where multiple addresses were represented per parcel. Parcels that had no address points but did have values representative of improvements (buildings) where converted into centroid point locations and merged with the address points for use in analysis. There were a few instances with overlapping polygons in the parcels dataset that required those address points to be removed and centroids used in their place to avoid compounding values.

A.2.1.2. Asset Insurance Schedules

Asset insurance tables provided by the county were geocoded in GIS and used to supplement the critical infrastructure data. These data are referred to as "Real Property Assets" within this plan.

A.2.1.3. Population

Population estimates were derived from 5 year 2022 Census American Community Survey (ACS) estimates as applied to census block groups and then processed through GIS modeling in order to break down the proportional population for smaller units of area.

A.2.1.4. Critical Infrastructure

Critical facilities and transportation/lifeline typically include hospitals, fire stations, police stations, storage of critical records, and similar facilities. These data came from a collection of sources including but not limited to: Napa County GIS, Napa County insurance data, participating jurisdictions, California Department of Social Services (CDSS), California Energy Commission (CEC), Federal Communications Commission (FCC), United States Army Corps of Engineers (USACE), and FEMA. All data sources have a level of accuracy acceptable for planning purposes. See Table A-1 for a complete list of Critical Infrastructure data and sources used in the analysis.

A.2.2. Natural Hazard Data

A.2.2.1. Dam Inundation Zones

Dam inundation zone GIS data were provided by California Department of Water Resources. These represent the estimated flood extent in the event of dam failure for individual dams.

Hazard	Description
Inundation Area	Dam Inundation maps for the State of California are required by California Government Code Section 8589.5(b). DWR Dam Breach Inundation studies are used for inundation sourcing for dams with detailed boundaries.

Source: DWR

A.2.2.2. Earthquake Shaking

The CGS 2% chance/50-year probability map was used as a qualitative guide in selecting an earthquake epicenter-based ShakeMap scenario for analyses. The M6.7 West Napa and M7.1 Hunting Creek Berryessa earthquake scenarios were used in this plan's GIS analyses.

Intensity	MMI	Description/Damage
I-Not felt	0-1	Not felt except by a very few under especially favorable conditions.
II-Weak	1-2	Felt only by a few persons at rest, especially on upper floors of buildings.
III-Weak	2-3	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV-Light	3-4	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V-Moderate	4-5	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI-Strong	5-6	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII-Very strong	6-7	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII-Severe	7-8	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.

Intensity	MMI	Description/Damage
IX-Violent	8-9	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X-Extreme	9-10	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.

Source: USGS Scenario MMI Grid

A.2.2.3. Liquefaction

Hazard	Native Class	Description
Liquefaction Zone	Yes	Where the stability of foundation soils must be investigated, and countermeasures undertaken in the design and construction of buildings for human occupancy.

Source: Napa County Liquefaction Susceptibility

A.2.2.4. Flood Zones

FEMA regulatory flood plain GIS data was used as the basis of the flood hazard. The most recent and active Digital Flood Insurance Rate Map (DFIRM) / National Flood Hazard Layer (NFHL) was obtained from FEMA at the start of this project's analysis and utilized in this plan's GIS analyses.

Hazard	Flood Zone	Description
100-YR Flood [SFHA]	Subtype: Floodway	A "Regulatory Floodway" means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height. Communities must regulate development in these floodways to ensure that there are no increases in upstream flood elevations.
	SFHA outside Floodway	The land area covered by the floodwaters of the base flood is the Special Flood Hazard Area (SFHA) on NFIP maps. The SFHA is the area where the National Flood Insurance Program's (NFIP's) floodplain management regulations must be enforced and the area where the mandatory purchase of flood insurance applies.
500-YR Flood [non-SFHA]	Subtypes: 0.2% Annual Chance, Protected by Levee	Moderate risk areas within the 0.2-percent-annual-chance floodplain, areas of 1-percent-annual-chance flooding where average depths are less than 1 foot, areas of 1-percent-annual-chance flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 1-percent-annual-chance flood by a levee. No BFEs or base flood depths are shown within these zones.

Protected by Levee [non-SFHA]	Protected by Levee	Areas protected from the 1-percent-annual-chance flood by a levee. No BFEs or base flood depths are shown within these zones.

Source: FEMA MSC DFIRM

A.2.2.5. Slope Failure

California Geological Society deep seated landslide raster data were reclassified and converted into polygons based on the reclassification schema below.

Hazard	Native Class	Description
Low	1-5	These classes express the generalization that on very low slopes, landslide susceptibility is low even in weak materials, and that landslide susceptibility increases with slope and in weaker rocks.
Medium	6-7	Very high landslide susceptibility, classes VIII, IX, and X, includes moderate and steep slopes in hard rocks and weak rocks.
High*	8-10	Very high landslide susceptibility, classes VIII, IX, and X, includes very steep slopes in hard rocks and moderate to very steep slopes in weak rocks.

Source: CGS Susceptibility to Deep-Seated Landslides in California

A.2.2.6. Sea Level Rise

Hazard	Native Class	Description
MHHW	0	Data represents potential inundation from sea level rise from Mean High Water (MHHW) to 6 feet above MHHW in the year 2100. Inundation areas were created by NOAA Coastal Services Center (CSC) and defined using a modified bathtub approach.
1ft	1	
2ft	2	
3ft	3	
4ft	4	
5ft	5	
6ft	6	

Source: National Oceanic and Atmospheric Administration Coastal Services Center. Accessed via ABAG

A.2.2.7. Wildfire Hazard Severity Zones

Hazard	Native Class	Description
Moderate	Moderate (LRA & SRA)	Classification of a zone as moderate, high or very high fire hazard is based on a combination of how a fire will behave and the probability of flames and embers threatening buildings. "This data represents Fire Hazard Severity Zones (FHSZ) in the State Responsibility Area (SRA), effective April 1st 2024, and recommended Fire Hazard Severity Zones in the Local Responsibility Area (LRA) from 2007-2011. It also represents Fire Hazard Severity Zones originally adopted in SRA that have since been reclassified as LRA." - California Department of Forestry and Fire Protection. Accessed June 2024. ***Additionally - The Draft LRA delineations as modified and proposed by the County were utilized in all areas covered by the LRA Delineations. Outside of these areas, the authoritative April 2024 SRA's were leveraged.**
High	High (LRA & SRA)	
Very High	Very High (LRA & SRA)	

Source: CalFire & Napa County.

A.2.2.8. Wind Classification

Wind is classified by the National Renewable Energy Laboratory (NREL) based on average speeds across the ground at different elevations in meters per second (m/s) and the amount of power it is capable of producing (wind power density). Power density is measured in the amount of watts (W) that can be produced per square meter (m^2) of surface area on the blades of a wind turbine.

Wind Power Class	10 m (33 ft)		50 m (164 feet)[1]	
	Wind Power Density W/m^2	Mean Speed[2] m/s (mph)	Wind Power Density W/m^2	Mean Speed[2] m/s (mph)
1	≤ 100	4.4 (9.8)	≤ 200	5.6 (12.5)
2	100-150	5.1 (11.5)	200-300	6.4 (14.3)
3	150-200	5.6 (12.5)	300-400	7.0 (15.7)
4	200-250	6.0 (13.4)	400-500	7.5 (16.8)
5	250-300	6.4 (14.3)	500-600	8.0 (17.9)

6	300-400	7.0 (15.7)	600-800	8.8 (19.7)
7	>400	9.4 (21.1)	>800	11.9 (26.6)

Notes: [1]Vertical extrapolation of wind speed based on the 1/7 power law. 2Mean wind speed is based on Rayleigh speed distribution of equivalent mean wind power density and is for standard sea level conditions.

Source: NREL, 2007

A.2.3. Methodology Overview

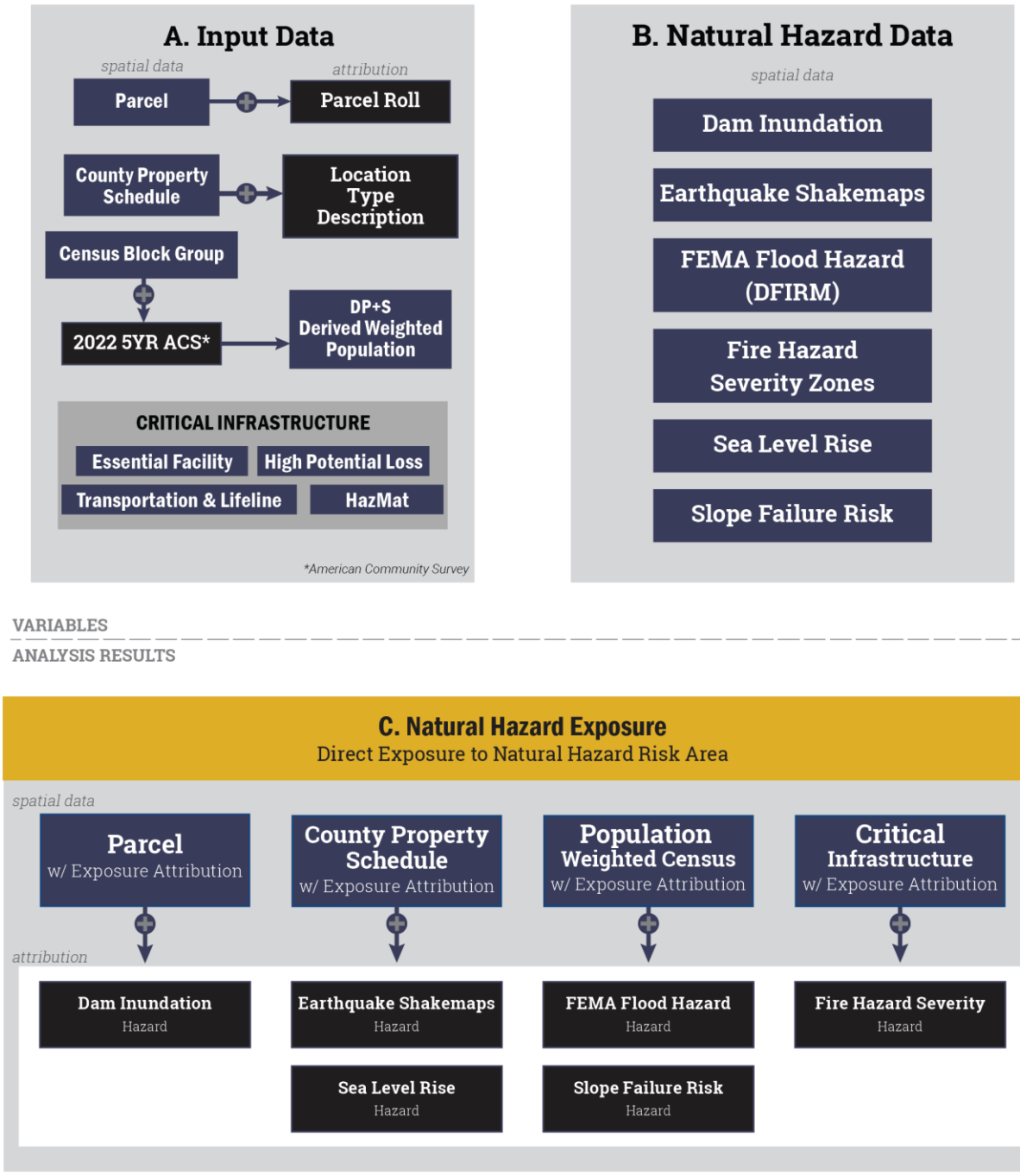


Figure A- 2: Data Analysis Methodology

A.2.4. Data Dictionary

Table A-1: Data Dictionary

Dataset	Data Steward	Notes
Jurisdictional/Municipal Boundaries	County	County Arc GIS Hub
Napa County Office of Education Boundary	County	Countywide
Stream	NHD	New NHD Plus
Water	NHD	New NHD Plus
Building Outlines	OSM	OSM Data - Used in some cartographic products only.
Parcel Geometry	County	County Arc GIS Hub
Parcel Roll	County	County Assessor's Office
Emergency Operations Center	County	Manual Placement
Fire Station	County	2024 County Data Request GDB
Hospital	County	2024 County Data Request GDB
Law Enforcement	County	2024 County Data Request GDB
Adult Res Facility	CDSS	CDSS From 2018 plan
Child Care Center	CDSS	CDSS From 2018 plan
Church	County	County GIS from 2018 plan
Communication Tower	FCC	FCC From 2018 plan
Real Property Assets	County	Insurance property schedule with appraisal values, building characteristics, and location.
Dam	USACE NID, DWR	3rd party source data can be supplemented by local data per availability.
Emergency Shelter	County	2024 County Data Request GDB
Family Child Care Home	CDSS	CDSS From 2018 plan
Farm Worker Housing	County	County GIS from 2018 plan
Historic Building	NPS	NPS From 2018 plan
Home Care Organization	County	County GIS from 2018 plan
Library	County	County GIS from 2018 plan
Medical Office	County	From Legacy 2013 plan data. Only available data.
Mobile Home Park	County	County GIS from 2018 plan
Res Elder Care Facility	CDSS	CDSS From 2018 plan
School	CDE	Broken out into two separate layers one for private and another for public
Airport	County	County GIS from 2018 plan
Bridge	NBI	National bridge inventory
Bus Stop	NVTA	From arcgis feature service
Levee	FEMA	NFHL 2018

Levee Centerline	USACE NLD	May be depricated by NLD WFS 2018
Levee Flood Wall	USACE NLD	NLD WFS 2018
NG Pipeline	CEC	From legacy CEC data
NG Station	CEC	From legacy CEC data
Power Plant	CEC	CEC from 2018 plan
Railroad	Esri	Legacy Esri data.
Street OSM	OSM	OSM Data pull includes highways and local roads
Substation	CEC	California Energy Commission
Bus_Route	NVTA	Only included within Napa County
HMMWC_Asset	HMMWC, DPS	2018 Data development for Howell Mountain Mutual Water Company
HMMWC_Dam	HMMWC, DPS	2019 Data development for Howell Mountain Mutual Water Company
HMMWC_Hydrant	HMMWC, DPS	2020 Data development for Howell Mountain Mutual Water Company
HMMWC_Pipeline	HMMWC, DPS	2021 Data development for Howell Mountain Mutual Water Company
Recycled_Water_Mains	NapaSan	2024 Data Request
Sewer_Gravity_Mains	NapaSan	2024 Data Request
Water_Supply_Intake	County	2024 County Data Request GDB
Water_Tank	County	2024 County Data Request GDB
Transmission Line	CEC	California Energy Commission
Wastewater Treatment Facility	County	Includes ownership information for NapaSan
Water Treatment Facility	County	2024 County Data Request GDB
Geotracker CleanupSite	Geotracker	Geotracker cleanup sites active
HWTS Active Facility	DTSC	Hazardous Waste Tracking System Active Facilities
Landfill	County	County GIS from 2018 plan
Census Block Group	US Census Bureau	2022 ACS
Dam Inundation	DWR	DWR covers all dams included in legacy Cal OES data as well as additional studies. More than 70 dams in county
EQ Scenarios 1-X	USGS, CISN	Chosen qualitatively from shake potential map
Flood Hazard	FEMA	06055C Obtained July 2024
Landslide Susceptibility	CGS	Classified and post-processed by DPS
Sea Level Rise	ABAG	ABAG SLR Inundation data from 2018 plan. Metadata describes NOAA.
Shake Potential	USGS, CISN	Used to illustrate scenario risk
Wildfire Hazard Severity Zone	CalFire	Modified Draft LRAs from 2025 and New 2024 data that includes combined SRA and LRA FHSZ.

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Appendix B. Process Documentation

NAPA COUNTY

Multi-Jurisdictional Hazard Mitigation Plan

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Planning Process Documentation Appendix

Table of Contents

Planning Committee Meeting Documentation B.1-1

Jurisdictional Breakout Meetings B.1-39

Public Notice & Press Release Documentation B.2-1

Survey & Results Documentation B.3-1

Mitigation Strategy Prioritization Process Documentation B.4-1

Website Documentation B.5-1

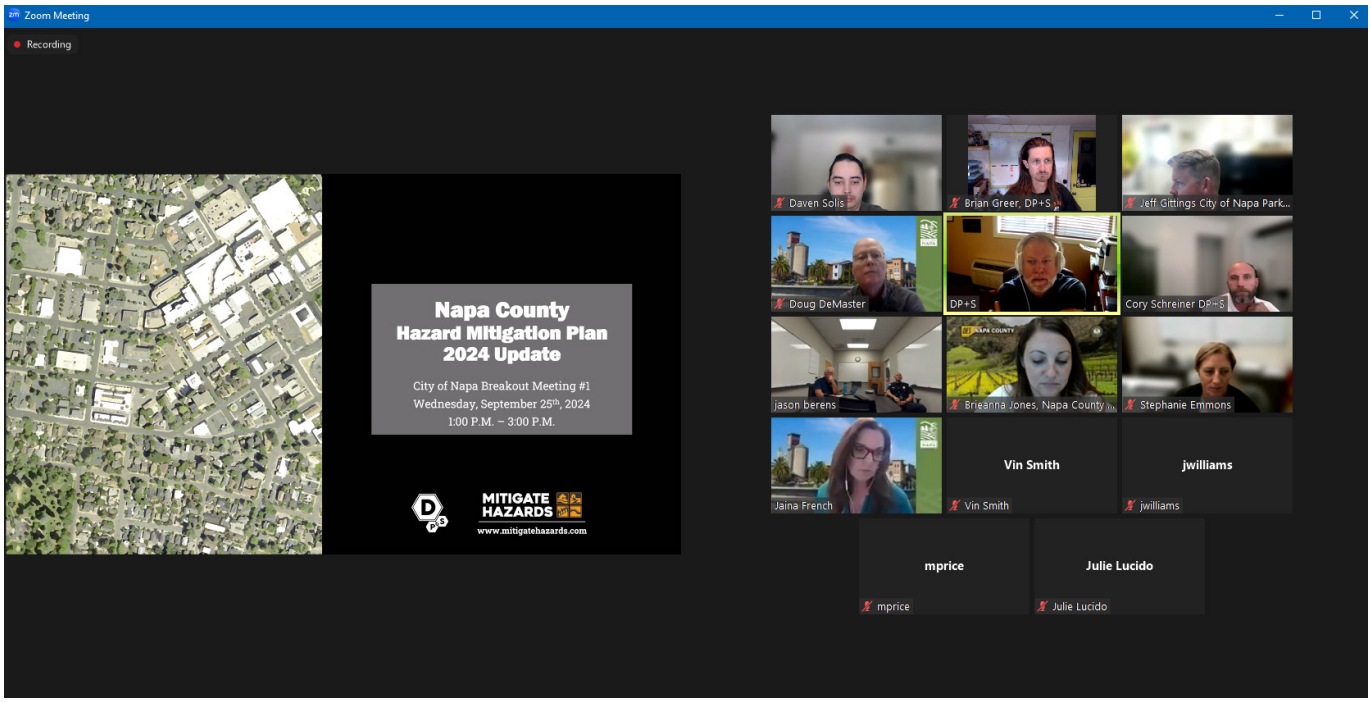
Outreach Events B.6-1

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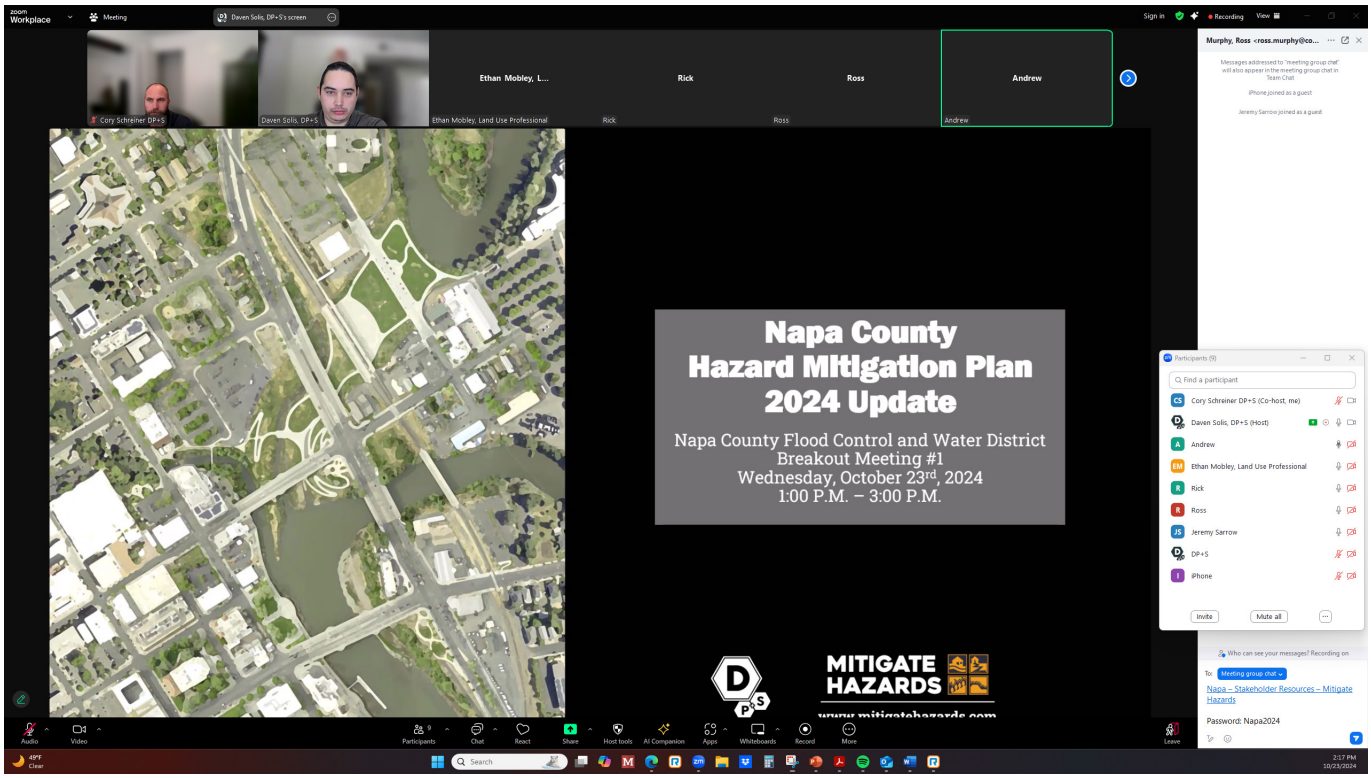
Planning Committee Meeting Documentation

Appendix B.1

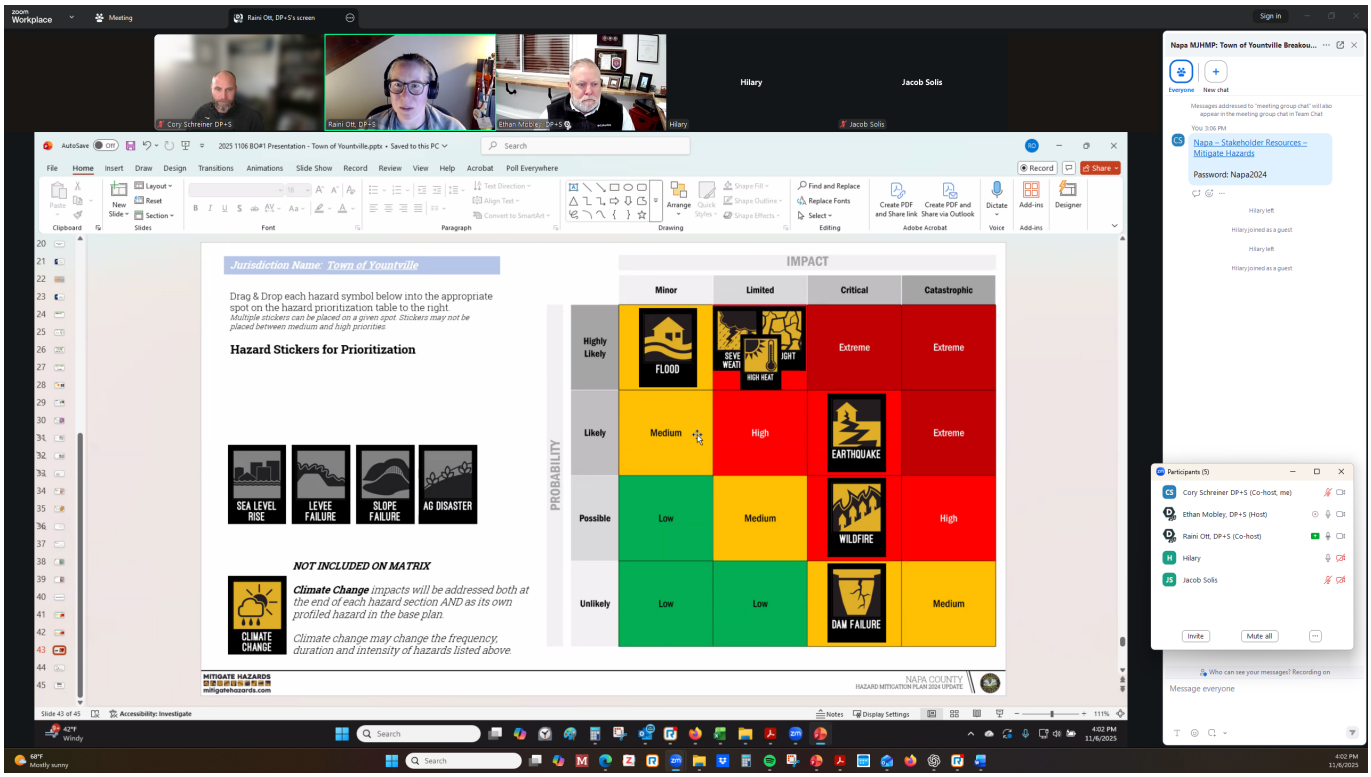
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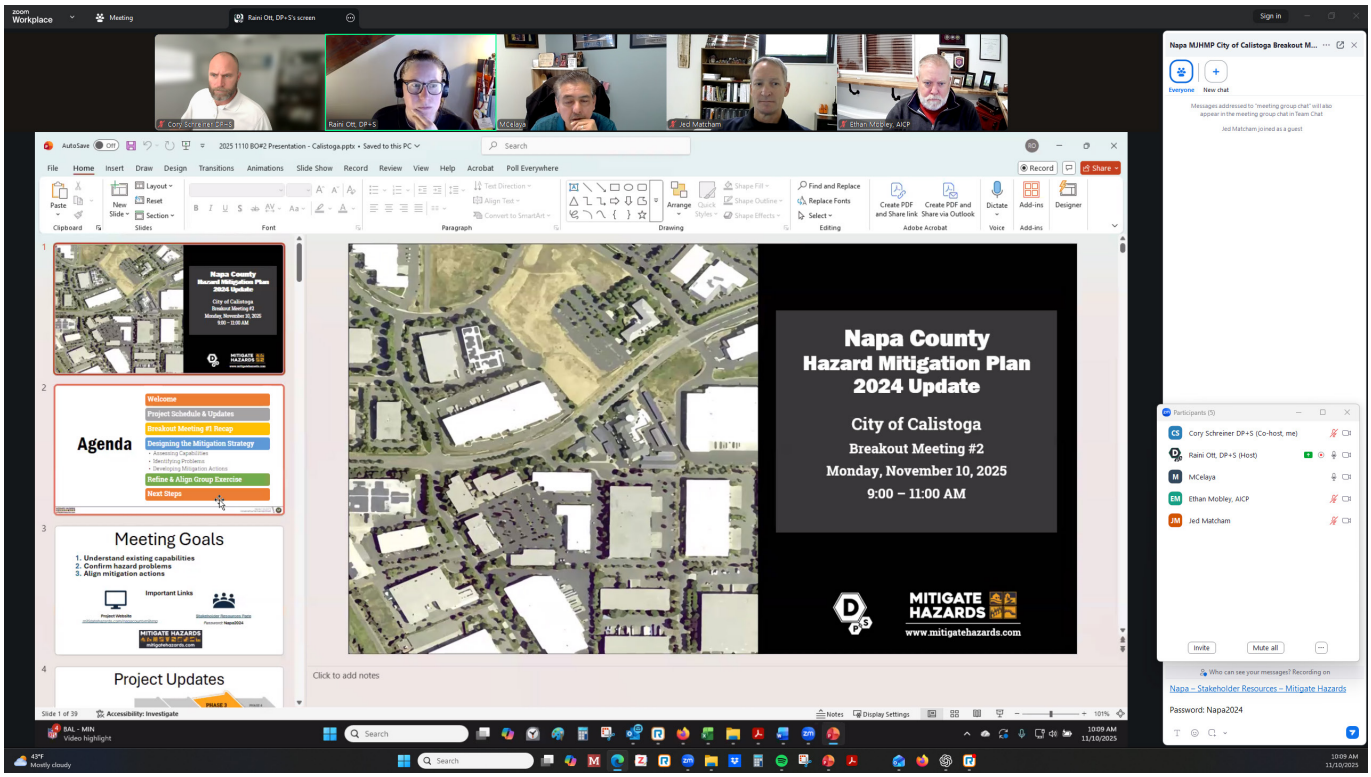
BO 1 Napa City Zoom



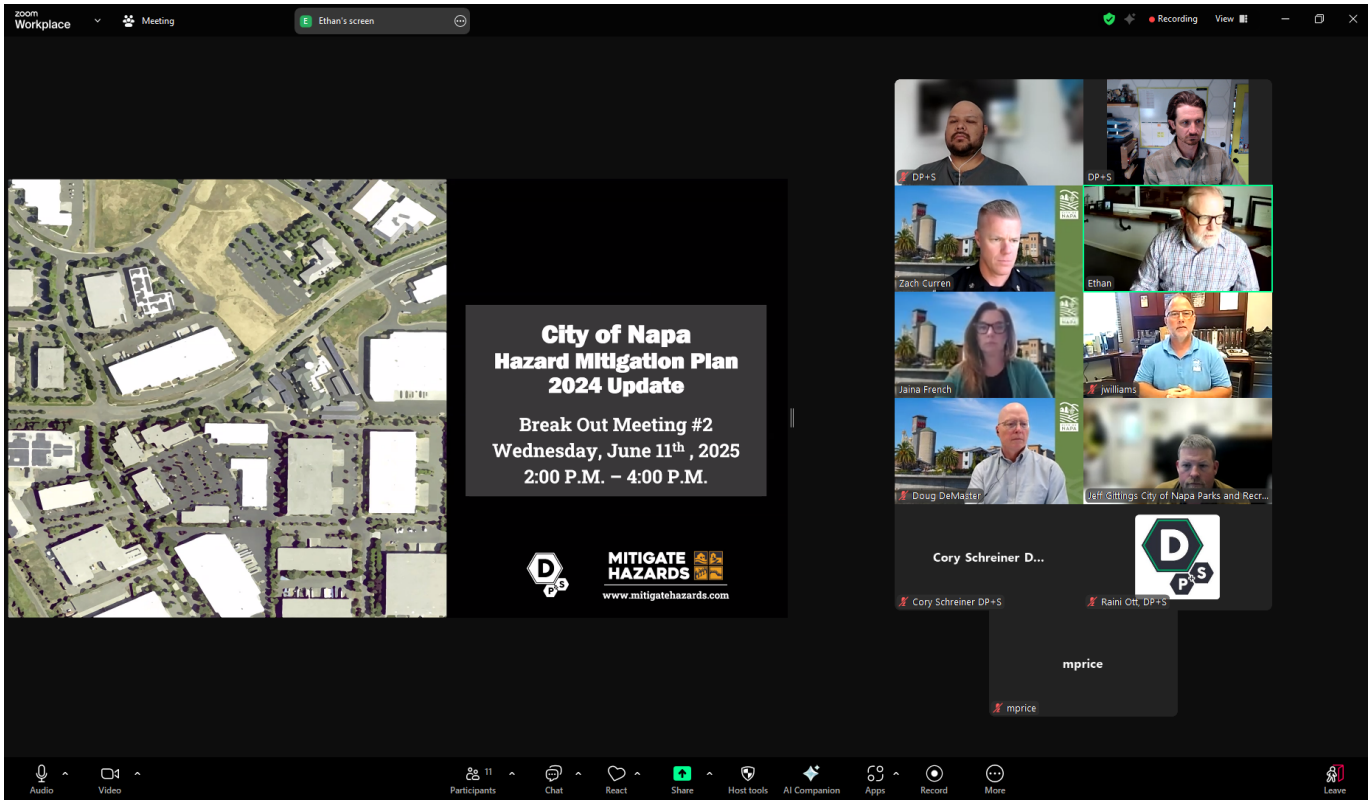
BO 1 NCFCWD Zoom



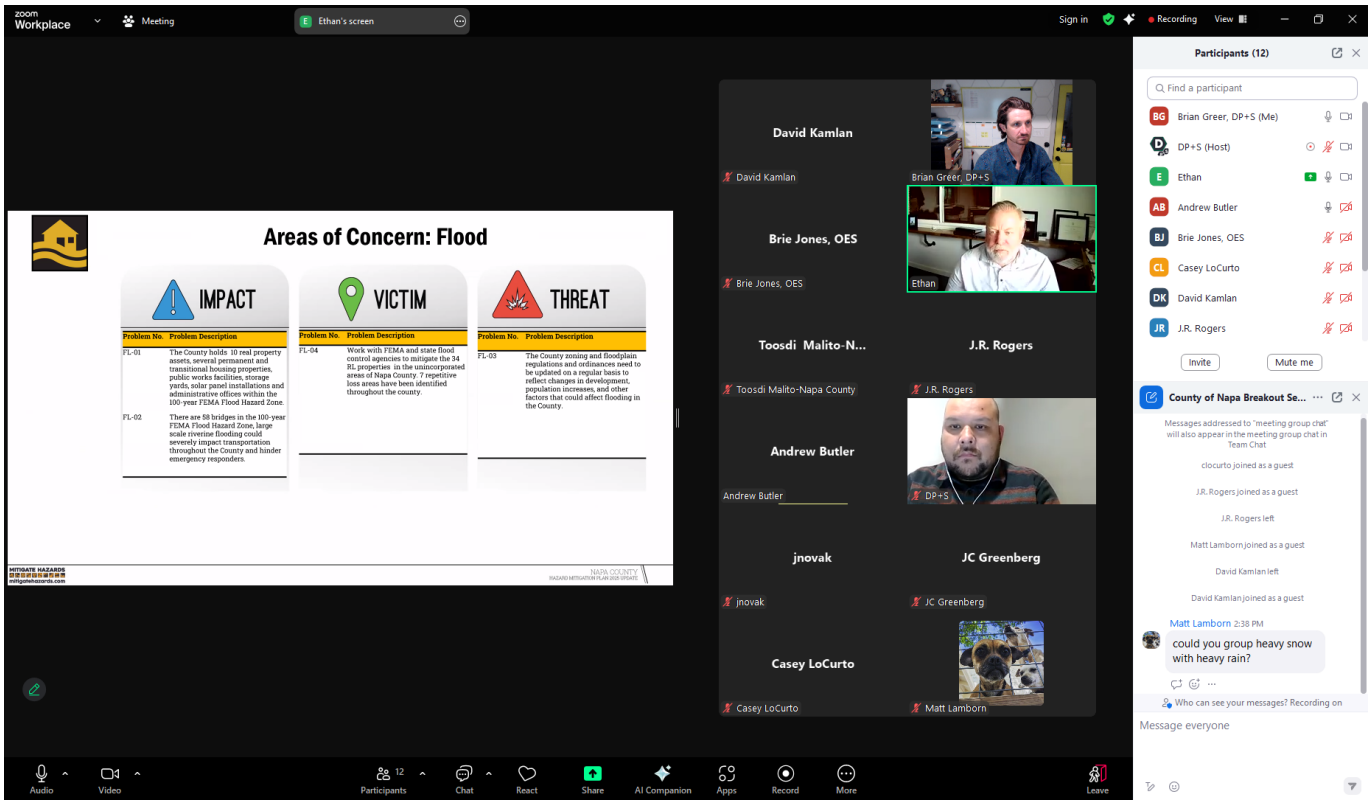
BO 1 Yountville Zoom



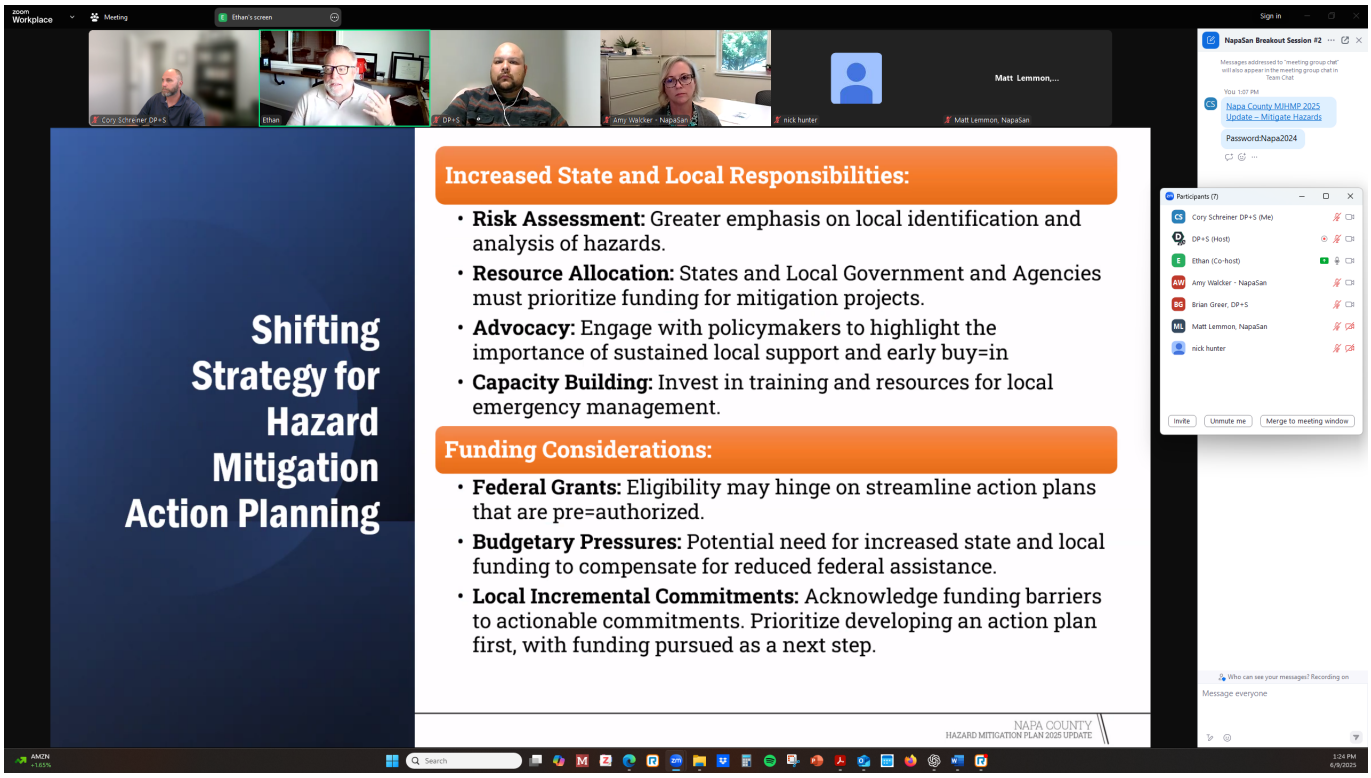
BO 2 Calistoga Zoom



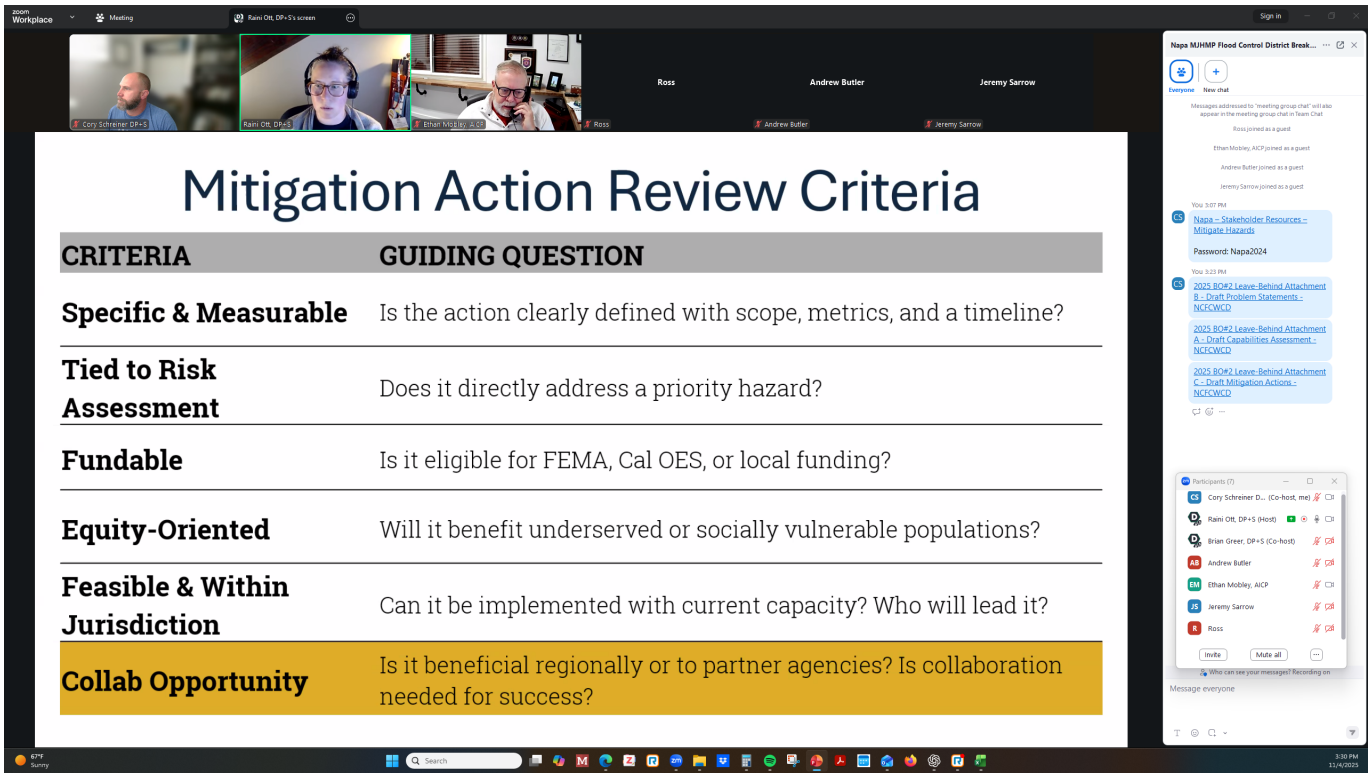
BO 2 Napa City Zoom



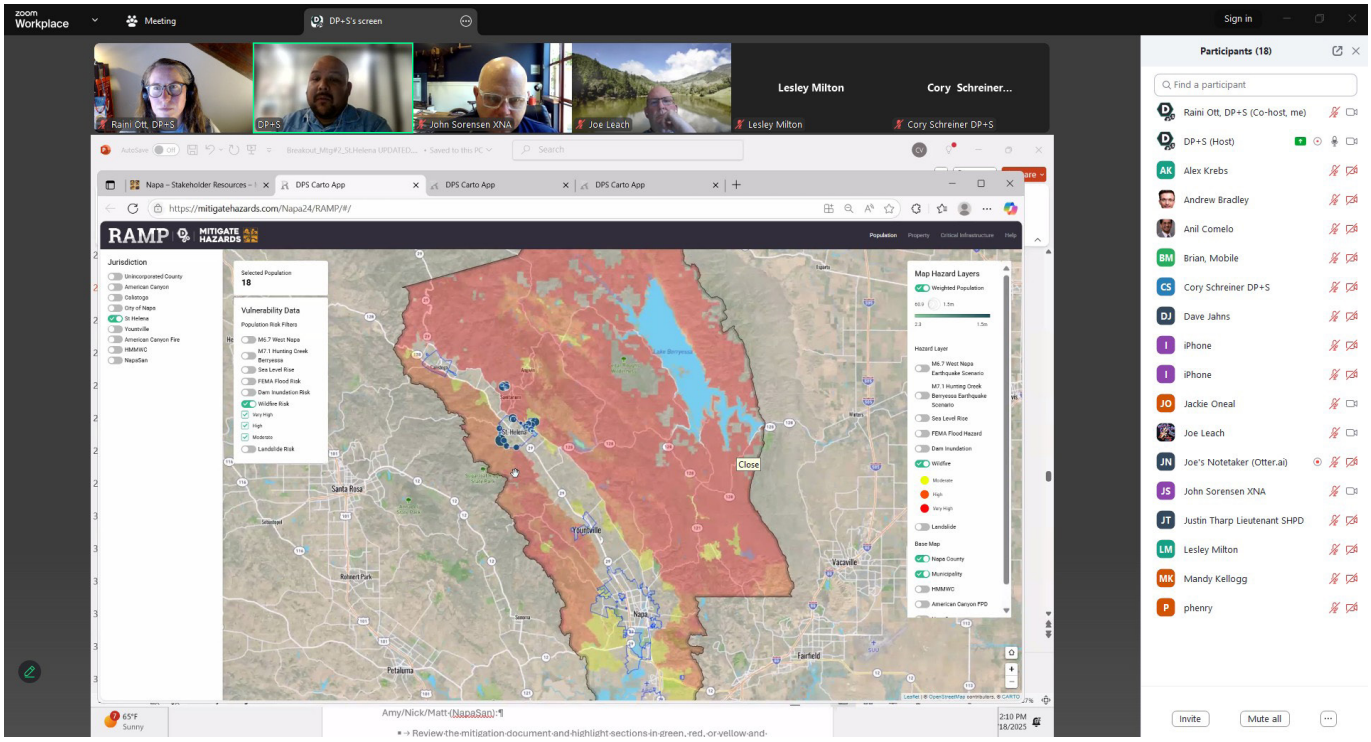
BO 2 Napa County Zoom



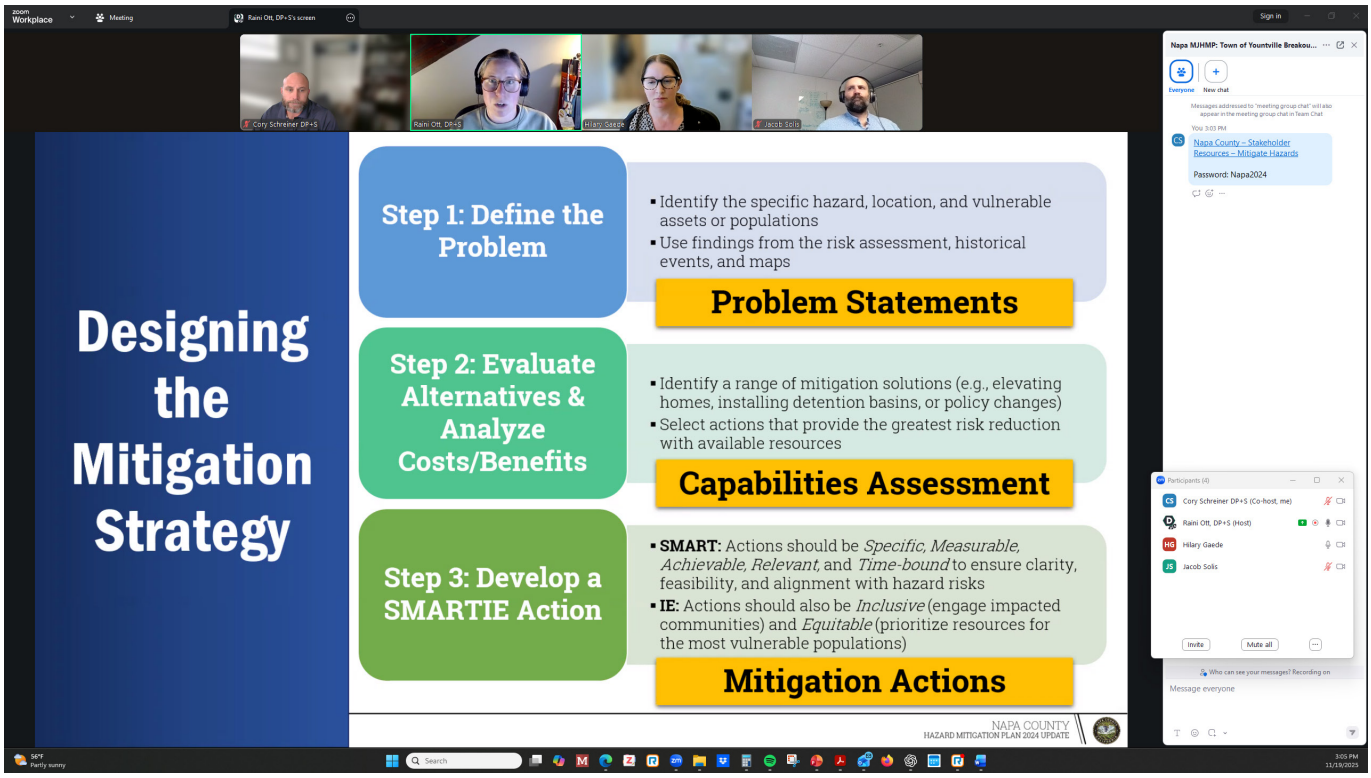
BO 2 Napa San Zoom



BO 2 NCFCWD Zoom



BO 2 St Helena Zoom



BO 2 Yountville Zoom

NAPA COUNTY
HAZARD MITIGATION PLAN 2024 UPDATE

Meeting Agenda:

Napa County, California

Mulit-Jurisdictional Hazard Mitigation Plan 2024 Update Kick-Off Meeting

Wednesday, February 28, 2024, 1:00 p.m. – 2:00 p.m.

Meeting Objectives

- Welcome and Introductions
- Scope of Work Review
- Participant Expectations
- Local Hazard Mitigation Planning Process
- Project Schedule
- Next Steps

NOTES

Kick Off Agenda

NAPA COUNTY
HAZARD MITIGATION PLAN 2024 UPDATE

Multi-Jurisdictional Hazard Mitigation Plan 2024 Update
Kick-Off Meeting
Wednesday February 28th, 2024, 1:00 p.m. – 2:00 p.m.

Sign In Sheet

Name	Email	Title	Agency
Brieanna Jones		Emergency Services Officer	Napa OES
[illegible]	Leif.Bryant@countyofnapa.	LOGS CHIEF	NAPA FLOOD
CHARLES RHOADS	CRHOADS@CITYOFNAPA.ORG	BATT CHIEF	NAPA [illegible]
Josh Schultz	jschultz@napacoe.org	Deputy Superintendent	Napa COE.
ZACH CURREN	zcurren@cityofnapa.org	FIRE CHIEF	NAPA FIRE

PAGE _____ of _____

Kick Off Sign In 1

NAPA COUNTY
HAZARD MITIGATION PLAN 2024 UPDATE

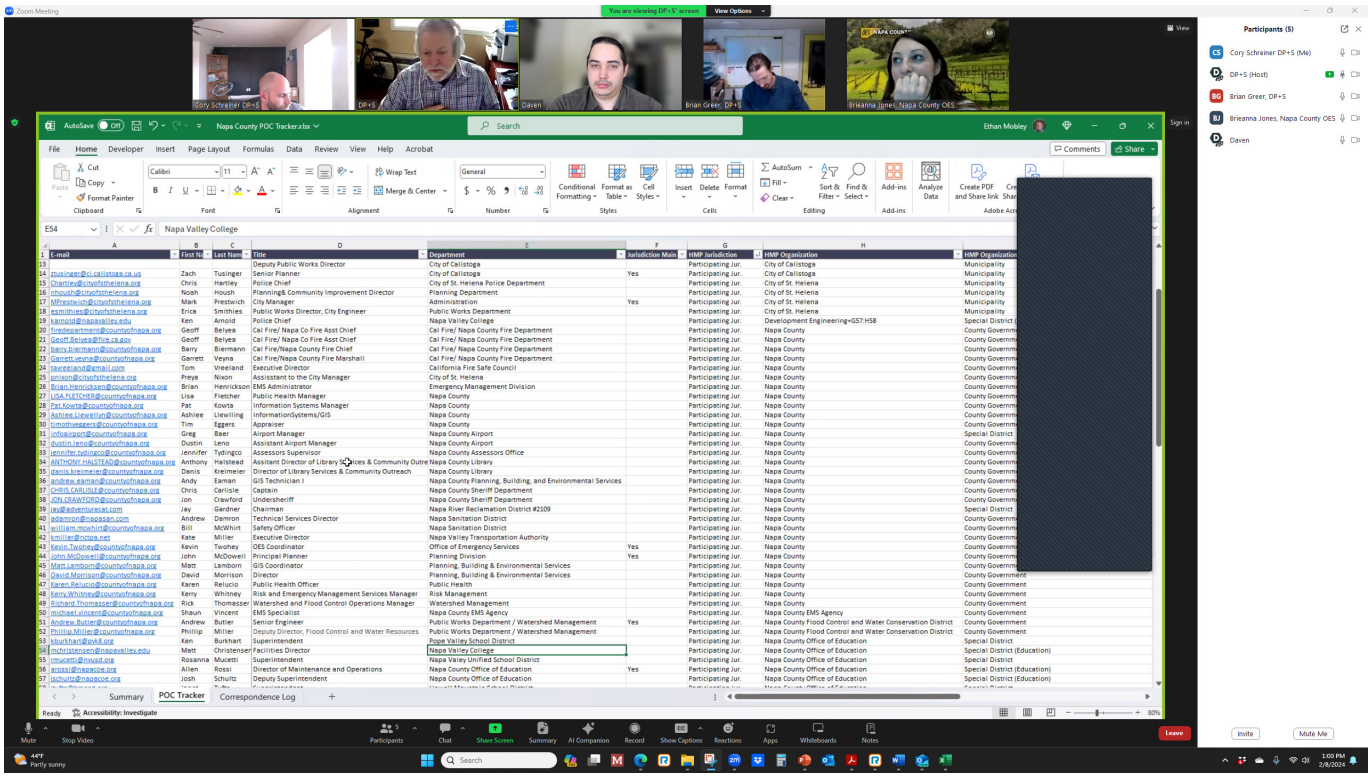
Multi-Jurisdictional Hazard Mitigation Plan 2024 Update
Kick-Off Meeting
Wednesday February 28th, 2024, 1:00 p.m. – 2:00 p.m.

Sign In Sheet

Name	Email	Title	Agency
Miguel Vargas	Miguel.Vargas@napavalley.edu	Director of Facilities	Napa Valley College
Angel Hernandez	angel.hernandez@countyofnapa.org	OES officer	Napa OES
TED MATCHAM	jmatchamee@ci.calistoga.ca.us	FIRE CHIEF	CALISTOGA FD
GEOFF BELYEA	GBELYEA@ANCWFIRE.COM	FIRE CHIEF	ACFPD
Jeremy Sartow	jeremy.sartow@countyofnapa.org	Flood control operations mngr	Flood/PW
Beatriz Becerra	bbecerra@yville.com	~~Fellow~~ mgmt. Fellows (Town mgr. office)	TOY

PAGE _____ of _____

Kick Off Sign In 2



Kick Off Zoom Attendance

NAPA COUNTY
HAZARD MITIGATION PLAN 2024 UPDATE

Meeting Agenda:

Napa County, California

Multi-Jurisdictional Hazard Mitigation Plan 2024 Update

Large Stakeholder Meeting #1

Tuesday, May 7th, 2024, 9:00 a.m. – 11:00 a.m.

Meeting Objectives

- **Executive Overview**
  - Welcome and Introductions
  - Polling Icebreakers
  - Background & Mitigation 101
- **The Planning Process**
  - Project Schedule
  - Website Review
- **Hazard Mitigation Funding Opportunities**
- **2019 HMP Review & Discussion**
  - Recent Success Stories
  - What's Changed
- **Outreach**

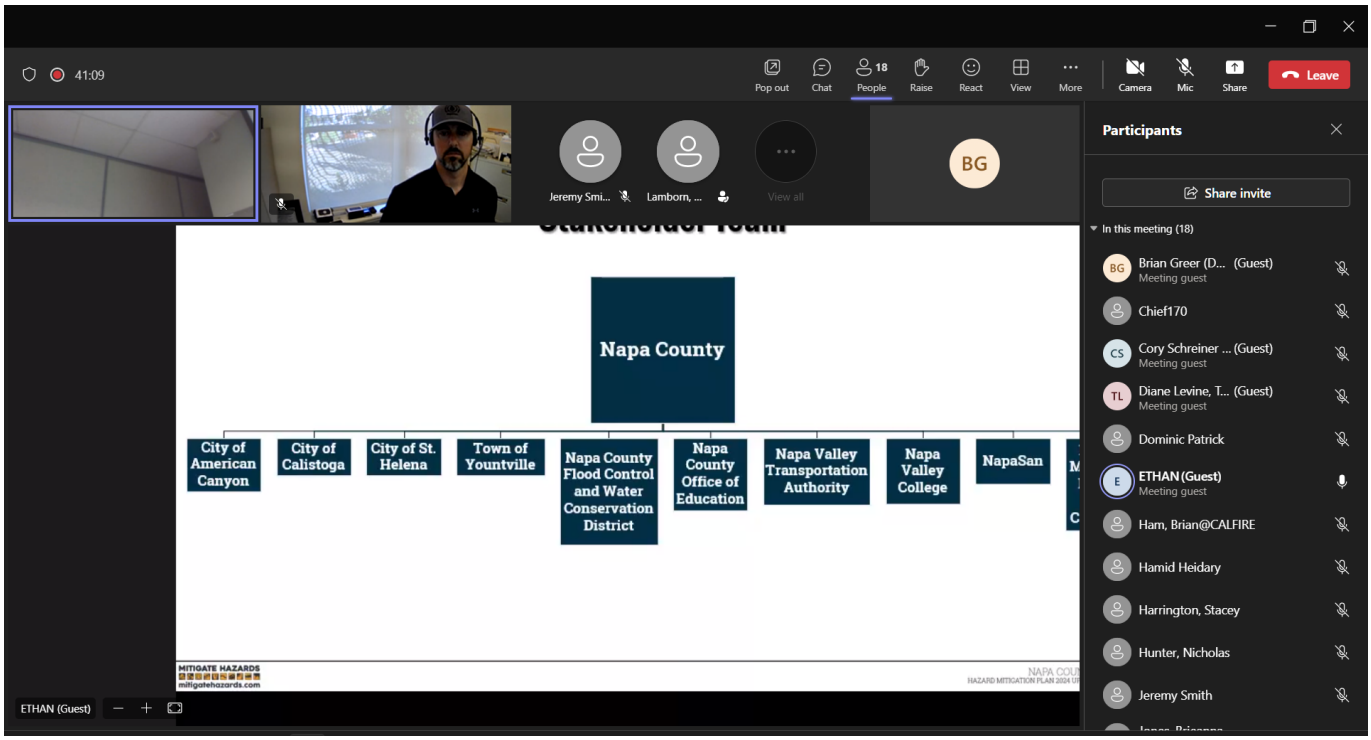
NOTES

NAPA COUNTY
HAZARD MITIGATION PLAN 2024 UPDATE

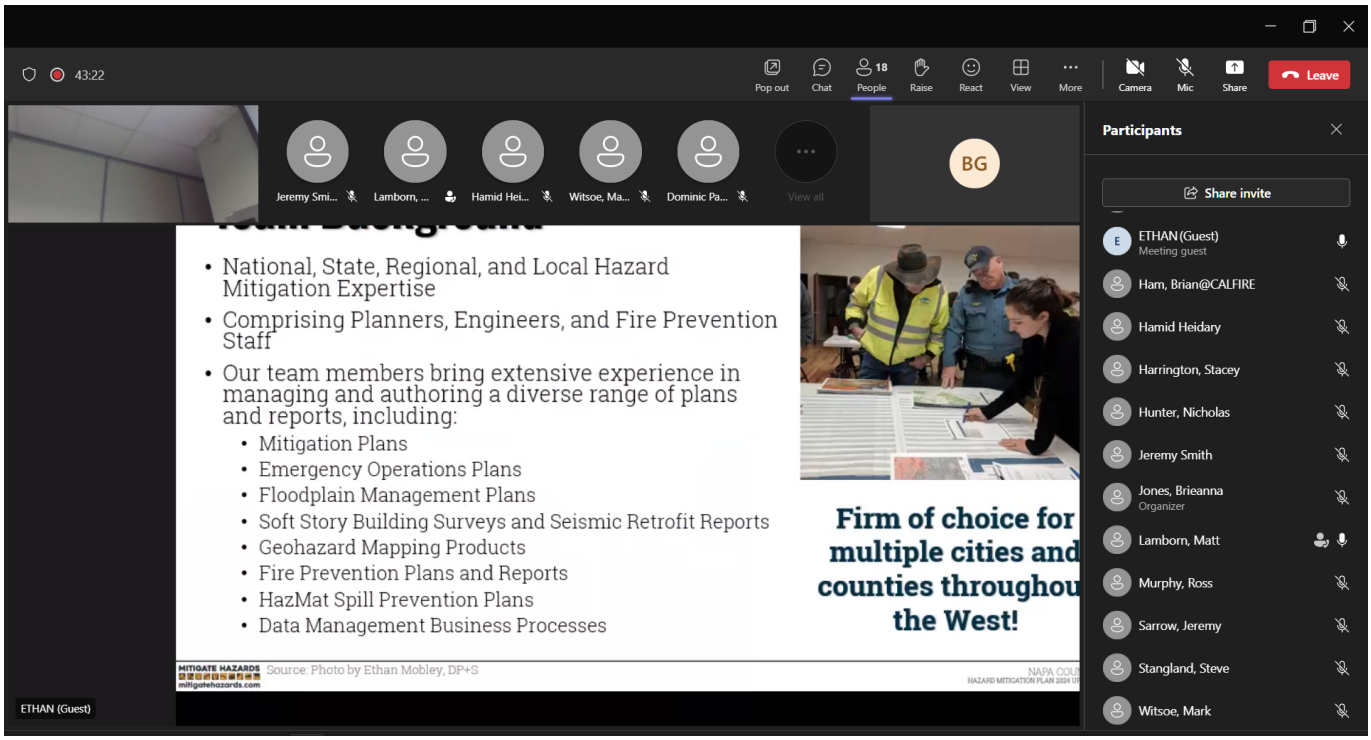
PC 1 Agenda 2



PC 1 In Person



PC 1 Zoom Screenshot 1



PC 1 Zoom Screenshot 2

NAPA COUNTY
HAZARD MITIGATION PLAN 2024 UPDATE

Multi-Jurisdictional Hazard Mitigation Plan 2024 Update
Stakeholder Meeting #1
Tuesday May 7th, 2024, 9:00 a.m. – 11:00 p.m.

Sign In Sheet

Name	Email	Title	Agency
Shannon Damonte	hmmwco@napanet.net	Administrative Manager	Howell Mountain Mutual Water Company
CHARLES RHODES	CRHODES@CITYOFNAPA.ORG	BATTALION CHIEF	NAPA FIRE
Tanner Hiers	Hmmwco1@napanet.net	GM	HMMCWC
AMBER WADE	awade@napavalley.edu	Police Chief	Napa College
Libby Payan	lpayan@NVTA.CA.GOV	Senior Program Planner (Transit)	NVTA
GEOFF BELYEA	GBELYEA@AMCALFIRE.COM	FIRE CHIEF	ACFPD
Matt Lemmon	mlemmon@napasan.com	Engineering Director	Napa San
Shawn Vinet	michal.vinet	EMS Johnson	Napa County EMS
ZACH CURREN	zcurren@cityofnapa.org	FIRE CHIEF	NAPA FIRE
Andrew Eaman	andrew.eaman@countyofnapa.org	Napa Co GIS (ITS)	Info Sys Spec.

PAGE _____ of _____

PC1 Sign In Scan

NAPA COUNTY
HAZARD MITIGATION PLAN 2024 UPDATE

Meeting Agenda:

Napa County, California

Multi-Jurisdictional Hazard Mitigation Plan 2024 Update

Large Stakeholder Meeting #2

July 18th, 2024, 10:00 a.m. – 12:00 p.m.

Meeting Objectives

- **Welcome and Introductions**
- **Meeting # 1 recap**
- **Risk Assessment / Community Vulnerability Review**
  - Demographics & Vulnerable Populations
  - Abbreviated Hazard Profiles
  - Complete Risk Matrix Exercise
- **Discuss Areas of Concern (AOC's)**
  - Preview Risk Assessment Mapping Platform (RAMP)
- **Review Outreach Progress & Next Steps**

Important Links

Project Webpage:
mitigatehazards.com/napacountymjhmp/
Website Username/Password:
Napa2024
Meeting Polling:
www.pollev.com/dynamicplanning

Pollev:

PC 2 Agenda 1

NAPA COUNTY
HAZARD MITIGATION PLAN 2024 UPDATE

NOTES:

PC 2 Agenda 2

NAPA COUNTY
HAZARD MITIGATION PLAN 2024 UPDATE

Napa County's RAMP Quiz Bowl!

1. What is the estimated population in Unincorporated Napa County living within the Landslide Hazard?
   6,178

2. What is the estimated population within the City of Napa living within Dam Inundation Zones?
   12,963

3. What is the estimated population within the City of Calistoga living within the 100-year flood zone?
   990

4. County wide, how many parcels are identified within very-high wildfire severity zones?
   4,085

5. County wide, how much property value is exposed within the 100-year floodplain?
   $1,441,320,455

6. County wide, how much property value is exposed within both the very high wildfire hazard and landslide risk? (Hint: use two property filters to answer this question!)
   $1,002,492,743

7. How many miles of lifeline are in the very strong shake zone from the M6.7 West Napa Scenario?
   1,000 mi

8. How many Fire stations ("Fire") are in the very strong shake zone from the M7.1 Hunting Creek Berryessa Scenario? Bonus Point: What is the address of one of them?
   13

9. County wide, how many of the following types of facilities are located within a very high wildfire severity zone:

Child Care Center	**4**
Mobile Home Park	**5**
Hospital	**1**
Real Property Asset	**81**
Water Treatment Facility	**3**

10. How many Residential Elder Care Facility are located within the City of Napa 100-yr flood risk layer?
    2

11. How many bridge points are located within the Unincorporated Napa County flood risk layer? **58**

12. What are the names of one of the HWTS facilities located within the City of St. Helena's flood risk layer?

PC2 Handout 1-answers

NAPA COUNTY
HAZARD MITIGATION PLAN 2024 UPDATE

Napa County's RAMP Quiz Bowl!

Instructions

Risk Assessment Mapping Platform (RAMP) was developed to provide stakeholders with an interactive way to explore the County's natural hazard risk landscape. The following quiz will test your ability to use RAMP to answer real-world questions about the exposure of population, parcels, and critical infrastructure to hazards like earthquake, landslide, dam failure, and more.

Navigate to **https://mitigatehazards.com/Napa24/RAMP/#/** to access the web platform.

FINAL SCORE: _____ out of 10

1. What is the estimated population in Unincorporated Napa County living within the Landslide Hazard?
2. What is the estimated population within the City of Napa living within Dam Inundation Zones?
3. What is the estimated population within the City of Calistoga living within the 100-year flood zone?
4. County wide, how many parcels are identified within very-high wildfire severity zones?
5. County wide, how much property value is exposed within the 100-year floodplain?
6. County wide, how much property value is exposed within both the very high wildfire hazard and landslide risk? (Hint: use two property filters to answer this question!)
7. How many miles of lifeline are in the very strong shake zone from the M6.7 West Napa Scenario?
8. How many Fire stations ("Fire") are in the very strong shake zone from the M7.1 Hunting Creek Berryessa Scenario? Bonus Point: What is the address of one of them?
9. County wide, how many of the following types of facilities are located within a very high wildfire severity zone:

Child Care Center	
Mobile Home Park	
Hospital	
Real Property Asset	
Water Treatment Facility	

10. How many Residential Elder Care Facility are located within the City of Napa 100-yr flood risk layer?
11. How many bridge points are located within the Unincorporated Napa County flood risk layer?
12. What are the names of one of the HWTS facilities located within the City of St. Helena's flood risk layer?

PC2 Handout 1

NAPA COUNTY
HAZARD MITIGATION PLAN 2024 UPDATE

Multi-Jurisdictional Hazard Mitigation Plan 2024 Update
Stakeholder Meeting #2
Thursday July 18th, 2024, 10:00 a.m. – 12:00 p.m.

Sign In Sheet

Name	Email	Title	Agency
Josh Schultz	jschultz@napacoe.org	Deputy Super.	Napa County Office of Ed
Shannon Damonte	hmmwco@napanet.net	Administrative Manager	Howell Mountain Mutal Water Co.

PAGE _____ of _____

NAPA COUNTY | HAZARD MITIGATION PLAN 2024 UPDATE

PC2 SignIn Scan (1)

NAPA COUNTY
HAZARD MITIGATION PLAN 2024 UPDATE

Multi-Jurisdictional Hazard Mitigation Plan 2024 Update
Stakeholder Meeting #2
Thursday July 18th, 2024, 10:00 a.m. – 12:00 p.m.

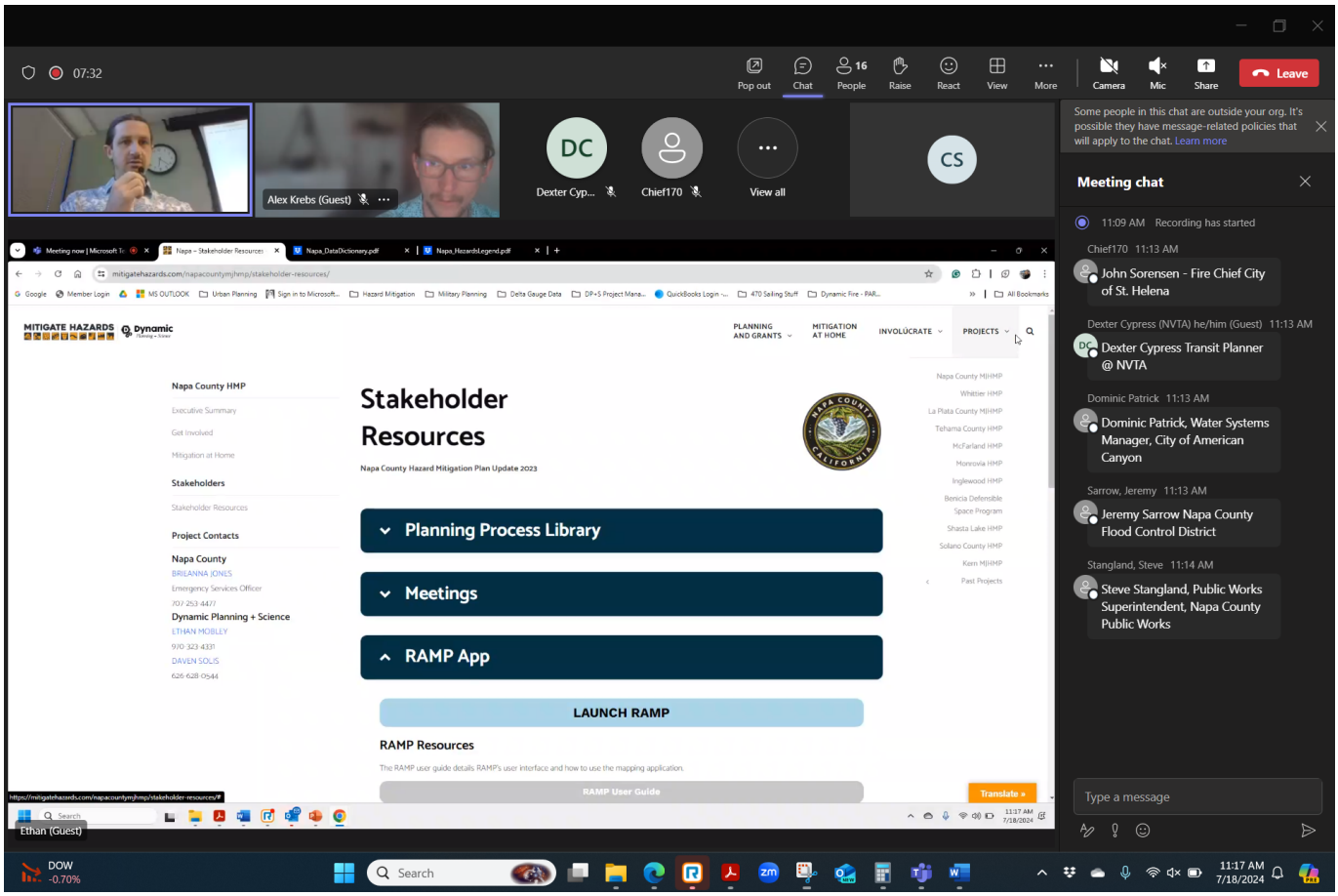
Sign In Sheet

Name	Email	Title	Agency
Shea Hunt	Michael.Vincent@countyofnapa	EMS Administrator	Napa County HHSA
Leif Bryant	LEIF.BRYANT@COUNTYOFNAPA.ORG	ENGINEERING TECH	NAPA FLOOD
Tammer S. Hess	HMMWCol@napa.net	GM	HMMWC
Nick Hunter	NHunter@NapaSan.com	Safety Officer	Napa Sanitation
Amy Walcker	awalcker@NapaSan.com	HR Mgr	NapaSan
ZACH CURREN	zcurren@cityofnapa.org	FIRE CHIEF	NAPA FIRE
GEOFF BELYEA	GBELYEA@AMCALFIRE.COM	FIRE CHIEF	ACFPD
Andrew Eaman	andrew.eaman@county ofnapa.	ITS GIS	ITS NapaCo
Angel Hernandez	angel.hernandez@county ofnapa.	OES officer	Napa OES
Jed Matcham	jmatcham@calistogaca.gov	Fire Chief	CALISTOGA

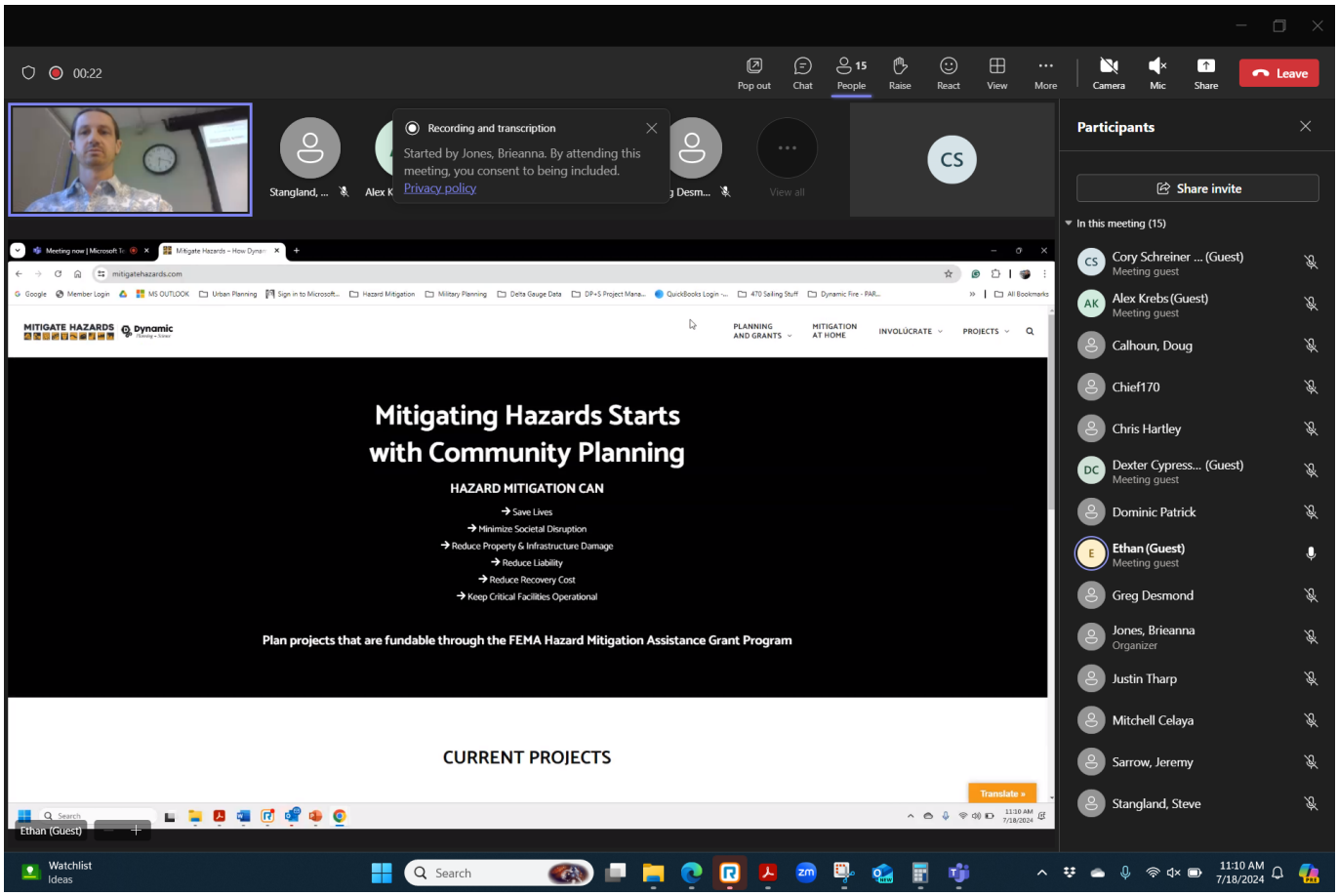
PAGE _____ of _____

NAPA COUNTY | HAZARD MITIGATION PLAN 2024 UPDATE

PC2 SignIn Scan (2)



PC2 Zoom Screenshot 1



PC2 Zoom Screenshot 2

NAPA COUNTY
HAZARD MITIGATION PLAN 2024 UPDATE

Meeting Agenda

Napa County, California

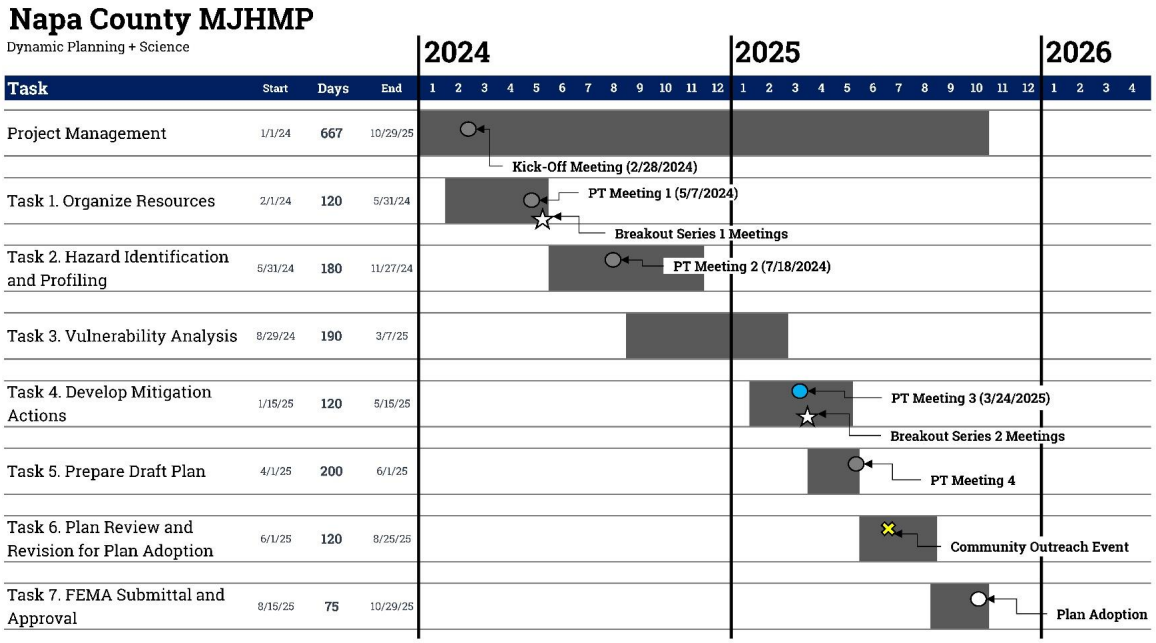
Multi-Jurisdictional Hazard Mitigation Plan 2025 Update

Large Stakeholder Meeting #3

Tuesday, March 25, 2025, 1:00 p.m. – 3:30 p.m.

Meeting Objectives

- **Welcome**
- **Project Schedule**
- **Recap/Key Takeaways**
  - Meeting #1 and #2
  - Breakout Sessions Reviews
- **Review Changes in Mitigation Strategies Since 2020**
- **Mitigation Action Exercise**
- **Closeout/Next Steps**
  - Community Engagement
  - Schedule Reminders



PC 3 Agenda 1



PC3 In Person

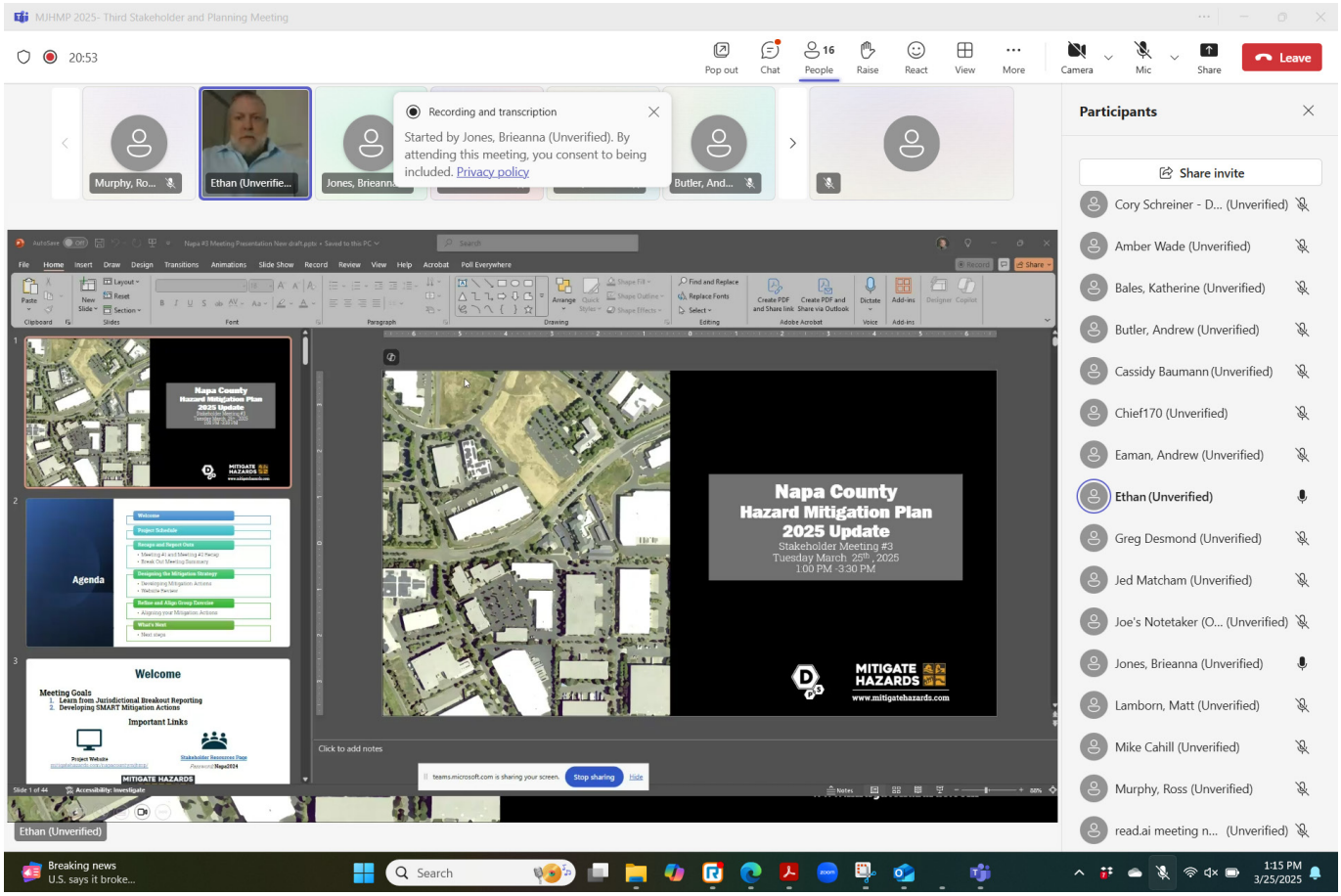
Multi-Jurisdictional Hazard Mitigation Plan 2024 Update
Stakeholder Meeting #3
Tuesday March 25, 2025, 1:00 p.m. – 3:00p.m.

Sign In Sheet

Name	Email	Title	Agency
Angel Hernandez	angel.hernandez@countyofnapa.org	OES officer	Napa OES
Brie Jones	briana.jones@countyofnapa.org	OES officer	Napa OES
ZACH CURREN	zcurren@cityofnapa.org	FIRE CHIEF	CITY OF NAPA
GEOFF BELYEA	GBELYEA@AMCALFIRE.com	FIRE CHIEF	AM CAL FIRE DIST.
Anthony Hatfield	anthony.hatfield@countyofnapa.org	Library Director	Napa County
Brian Green	brian@dynamicplanning.com	Data Viz. Manager	DPTS

PAGE _____ of _____

PC3 Sign In


MJHMP 2025- Third Stakeholder and Planning Meeting
20:53
Pop out
Chat
People
Raise
React
View
More
Camera
Mic
Share
Leave
Recording and transcription
Started by Jones, Brieanna (Unverified). By attending this meeting, you consent to being included. Privacy policy
Participants
Share invite
Cory Schreiner - D... (Unverified)
Amber Wade (Unverified)
Bales, Katherine (Unverified)
Butler, Andrew (Unverified)
Cassidy Baumann (Unverified)
Chief170 (Unverified)
Eaman, Andrew (Unverified)
Ethan (Unverified)
Greg Desmond (Unverified)
Jed Matcham (Unverified)
Joe's Notetaker (O... (Unverified)
Jones, Brieanna (Unverified)
Lamborn, Matt (Unverified)
Mike Cahill (Unverified)
Murphy, Ross (Unverified)
read.ai meeting n... (Unverified)
Napa County
Hazard Mitigation Plan
2025 Update
Stakeholder Meeting #3
Tuesday March 25th, 2025
1:00 PM -3:30 PM
MITIGATE HAZARDS
www.mitigatehazards.com
Agenda
Welcome
Meeting Goals
1. Learn from Jurisdictional Breakout Reporting
2. Developing SMART Mitigation Actions
Important Links
Project Website
Stakeholder Resources Page
Click to add notes
Stop sharing
Hide
Ethan (Unverified)
Breaking news
U.S. says it broke...
Search
1:15 PM
3/25/2025

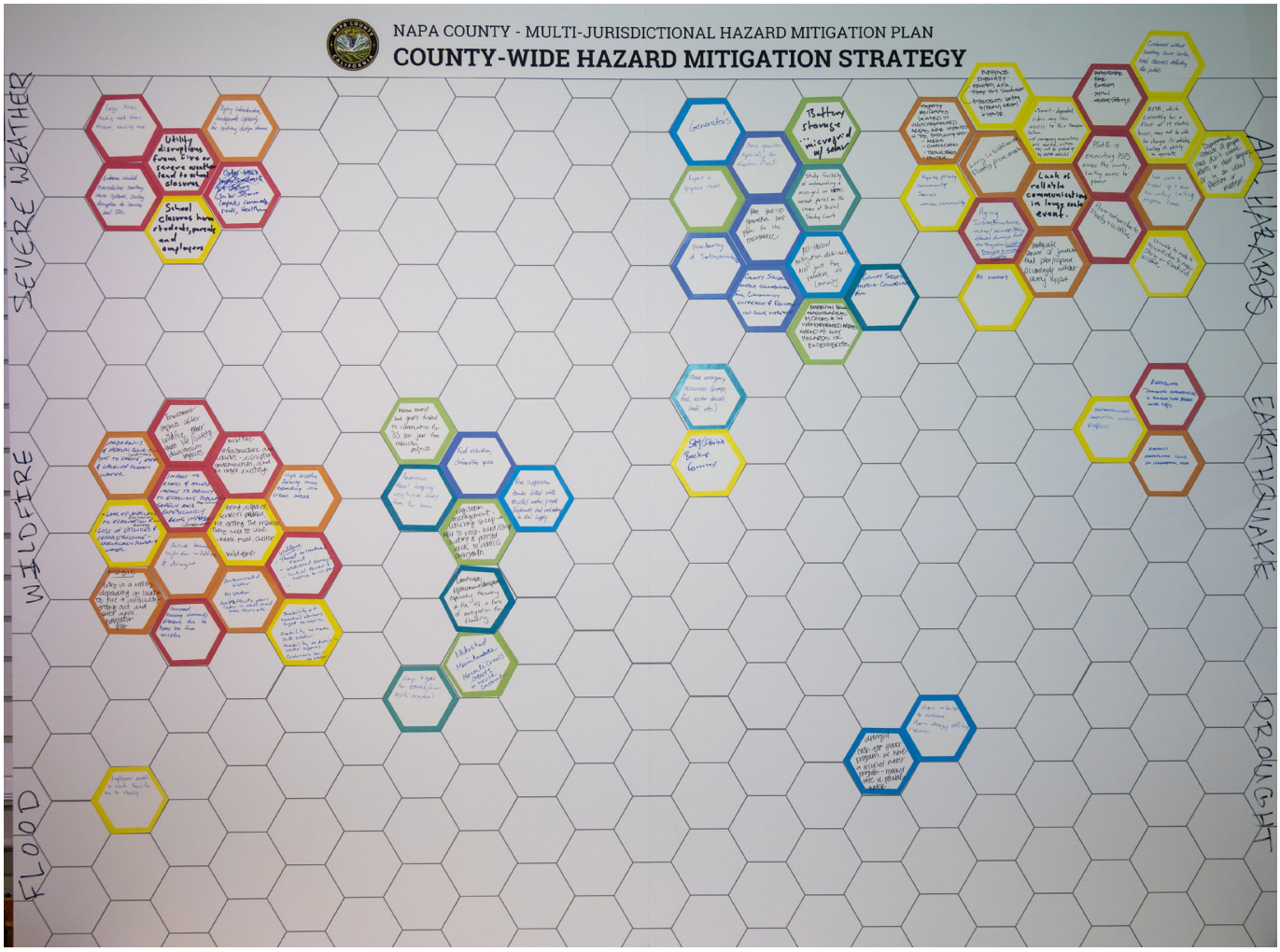
PC3 Zoom



PC 4 Meeting Photo 2



PC4 Meeting Photo 1



PC4 Poster Scan

NAPA COUNTY
HAZARD MITIGATION PLAN 2025 UPDATE

Multi-Jurisdictional Hazard Mitigation Plan
2025 Update Stakeholder Meeting #4
Wednesday December 10, 3:00 p.m.– 5:00p.m.

Sign In Sheet

Name	Email	Title	Agency
Brie Jones	brianna.jones@countyofnapa.org	OES	OES
Jacob Solis	jsolis@yville.com	Eng. Tech.	Yountville
Geoff Belter	GBELTER@AMCAN FIRE.CA.GOV	FIRE CHIEF	ACFPD
Matt Lemmon	mlemmon@napasan.com	Engineering Director	NapaSan
Shannon Damonte	hmmwc@napanet.net	Administrative Manager	Howell Mtn Mutual Water Co.
John Sorensen	chief10@cityofsthelena.org	Fire Chief	St. Helena City
Allie Ikeda	aikeda@americancanyon.gov	deputy city manager	american canyon
Paul O'Neill	poneill@cityofnapa.org	Assistant Planner	City of Napa
[illegible]	[illegible]	P+B DIRECTOR	Ctwstec.

PAGE _____ of _____

NAPA COUNTY | HAZARD MITIGATION PLAN 2025 UPDATE

PC4 Sign In Scan

Jurisdictional Breakout Meetings

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Napa County
Hazard Mitigation Plan 2024 Update

American Canyon Fire Protection District
Breakout Meeting #1

Wednesday, August 14th, 2024

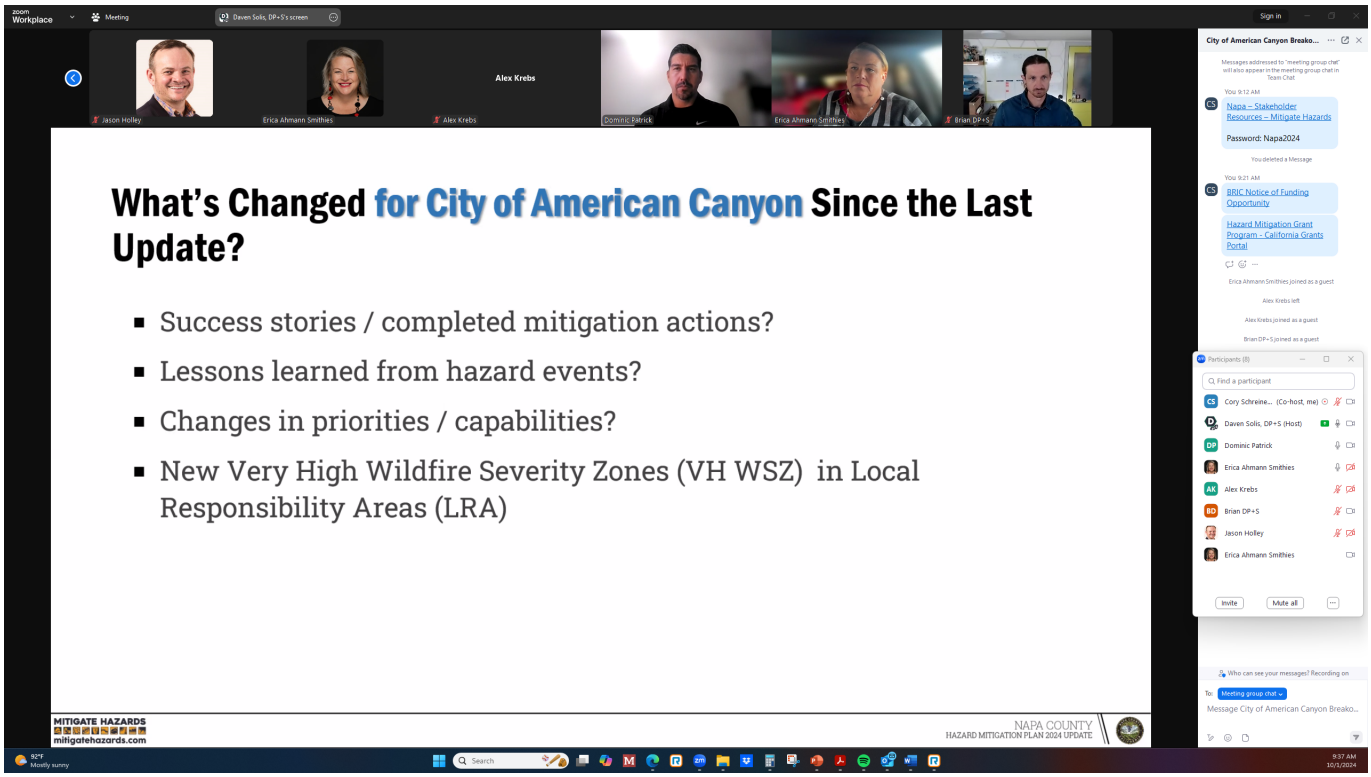
2:00 P.M. – 4:00 P.M.

MITIGATE HAZARDS
www.mitigatehazards.com

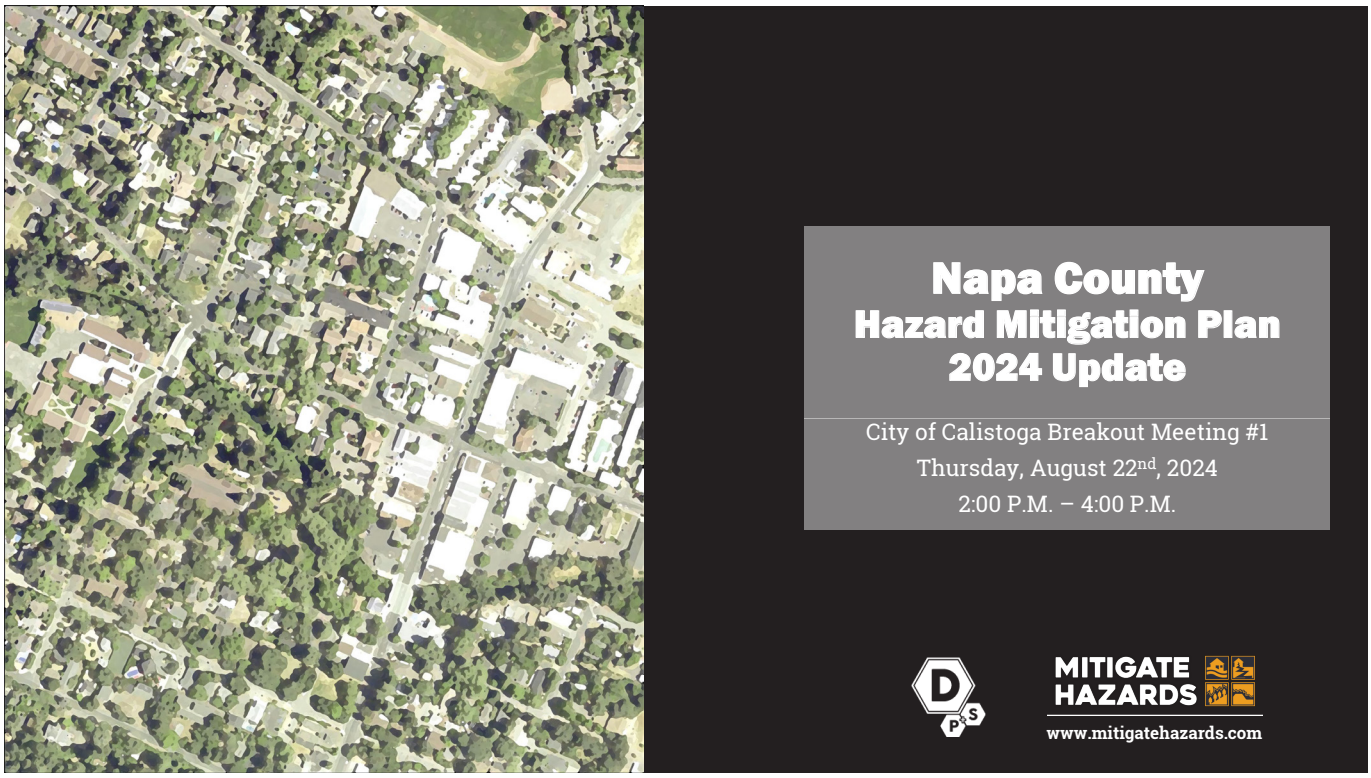
BO 1 ACFPD Meeting Presentation



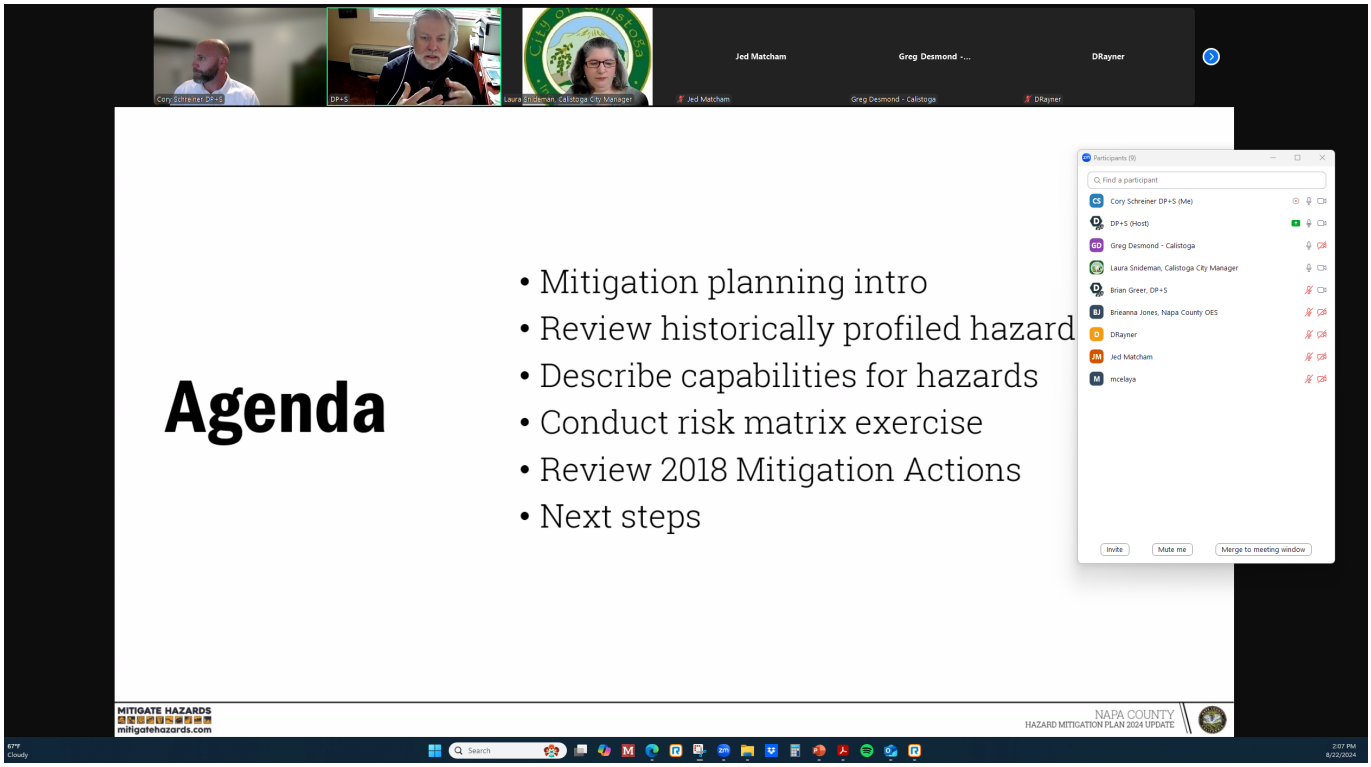
BO 1 American Canyon Meeting Slide



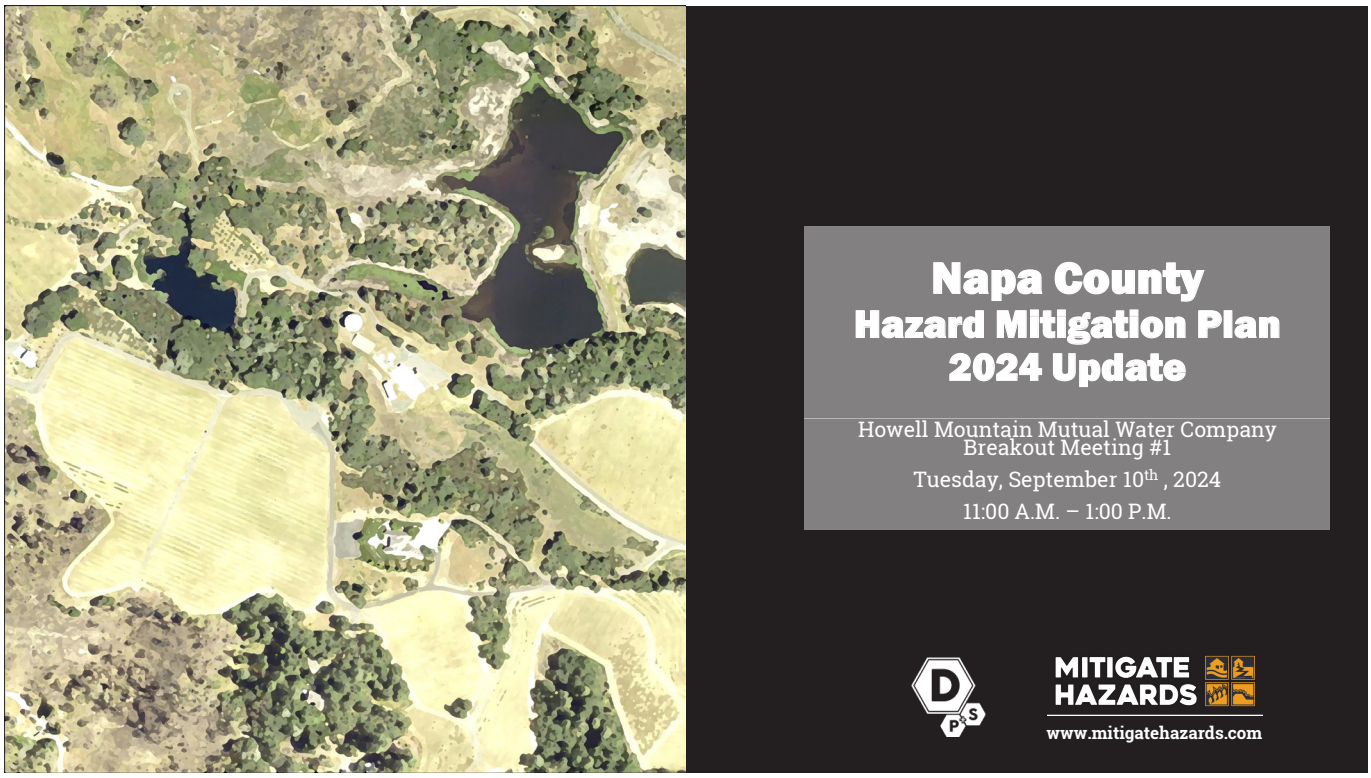
BO 1 American Canyon Zoom



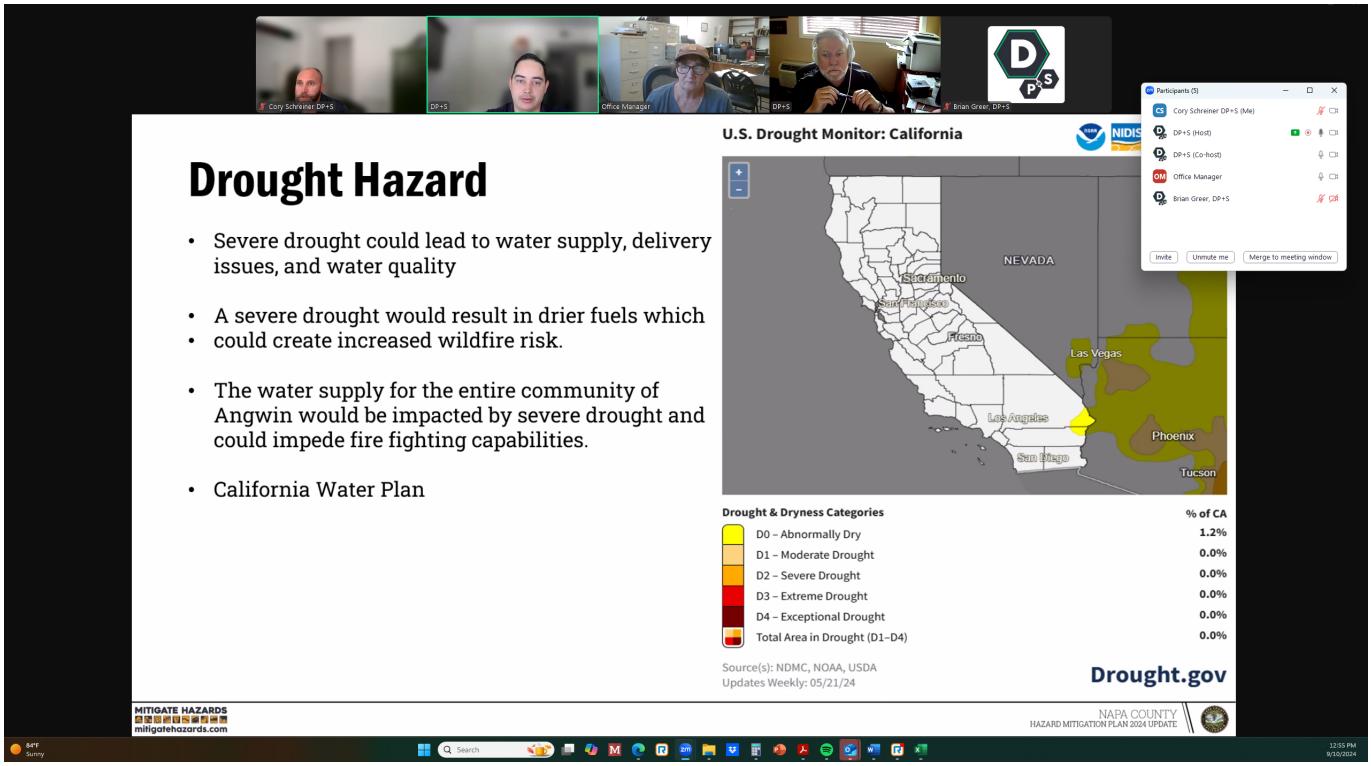
BO 1 Calistoga Meeting Slide



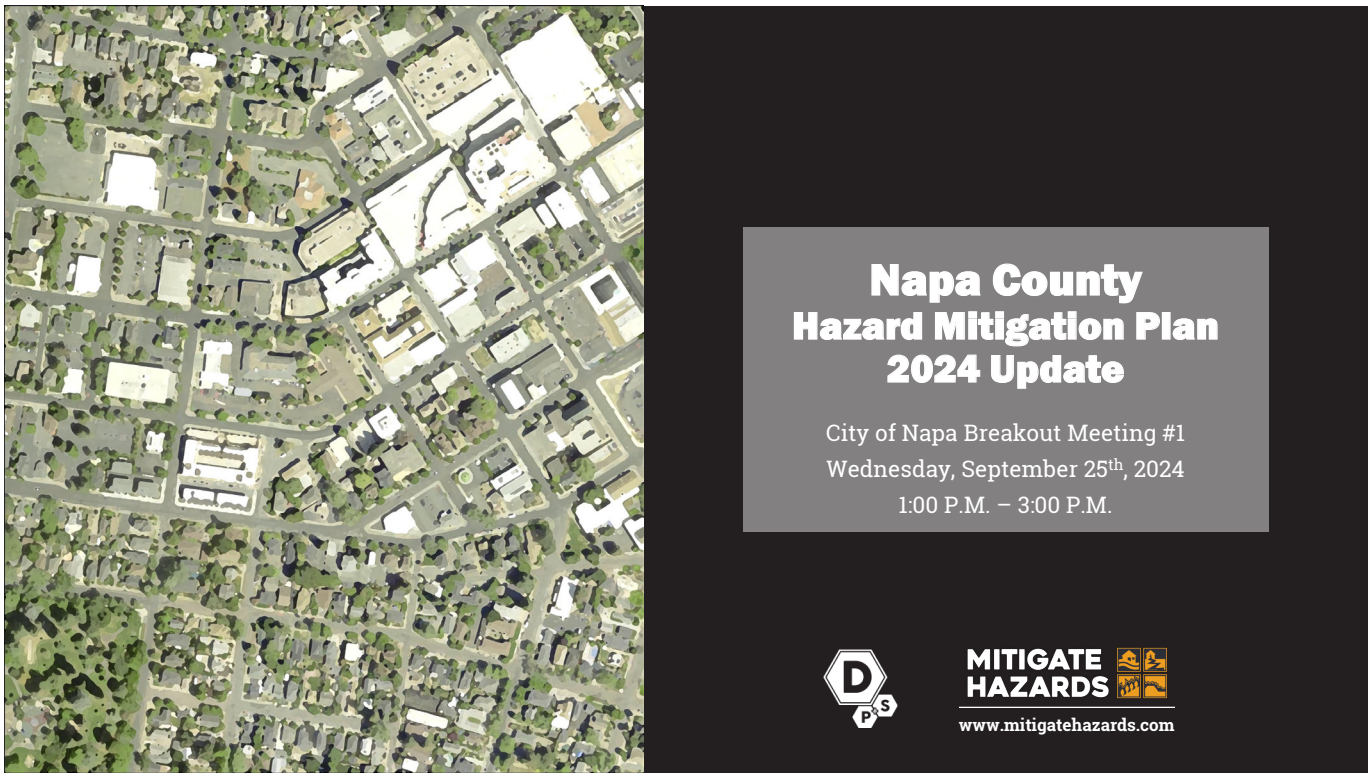
BO 1 Calistoga Zoom



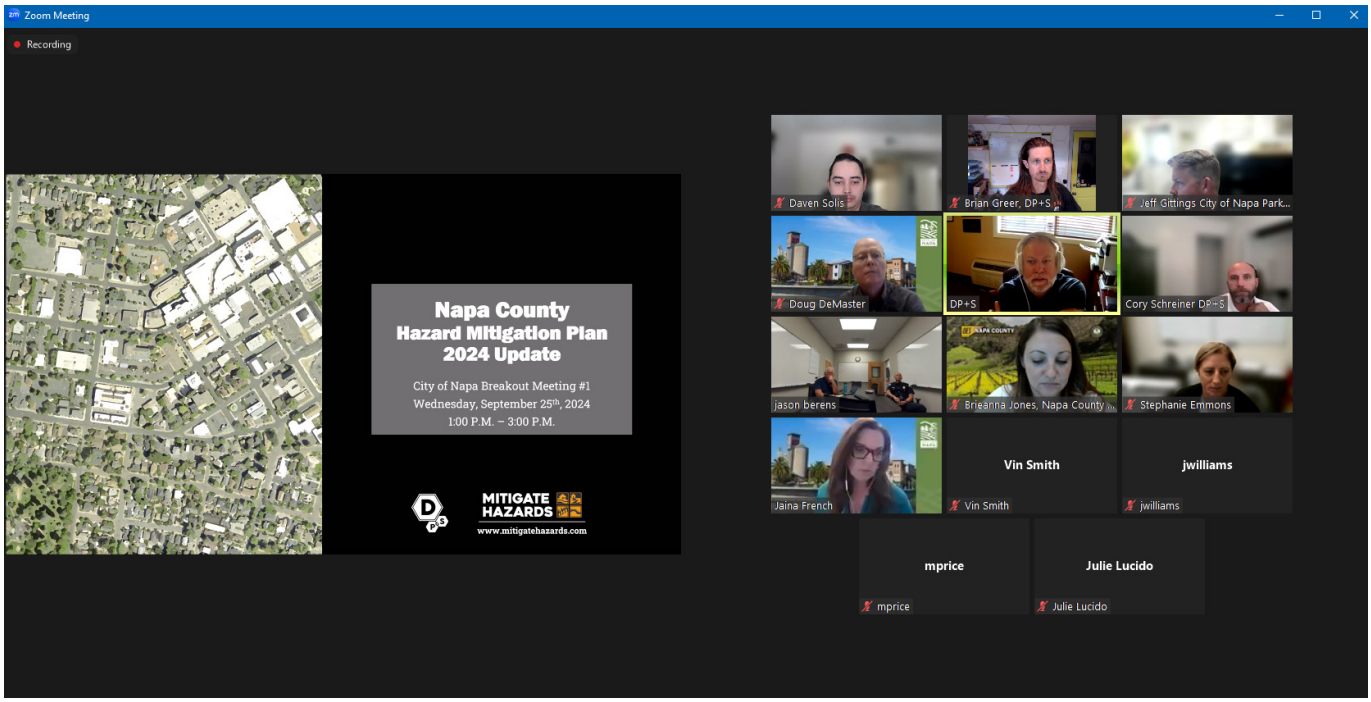
BO 1 HMMWC Meeting Slide



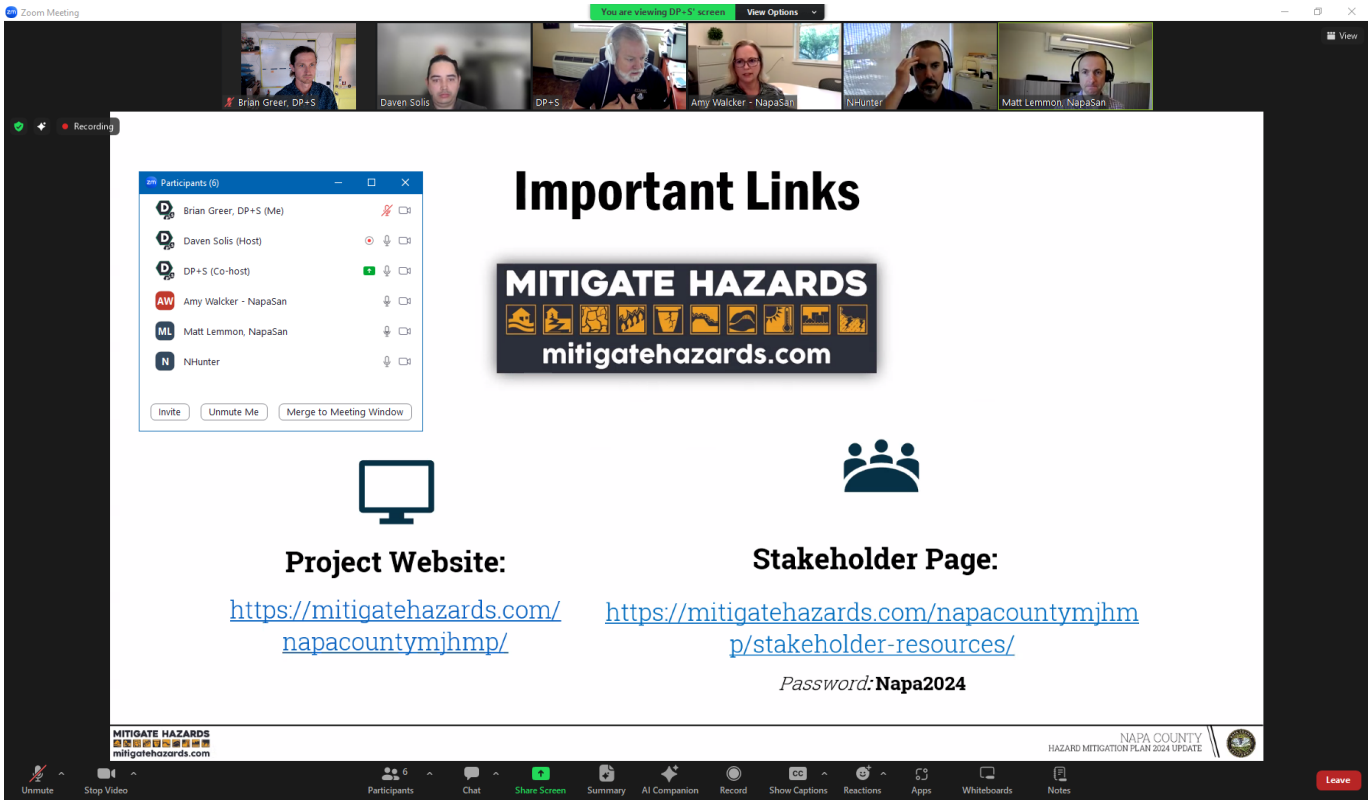
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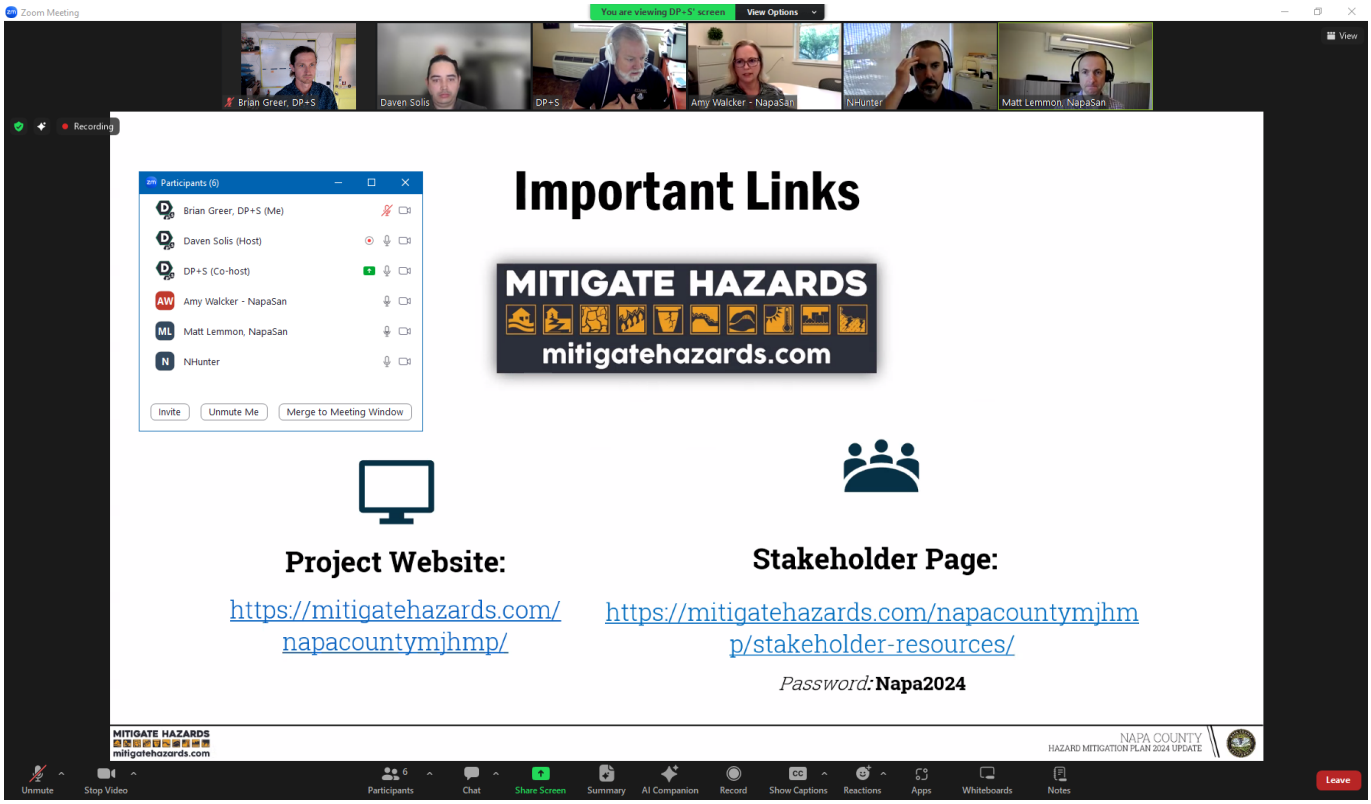
BO 1 Napa Co Meeting Slide



BO 1 Napa Co Zoom



BO 1 Napa San Zoom



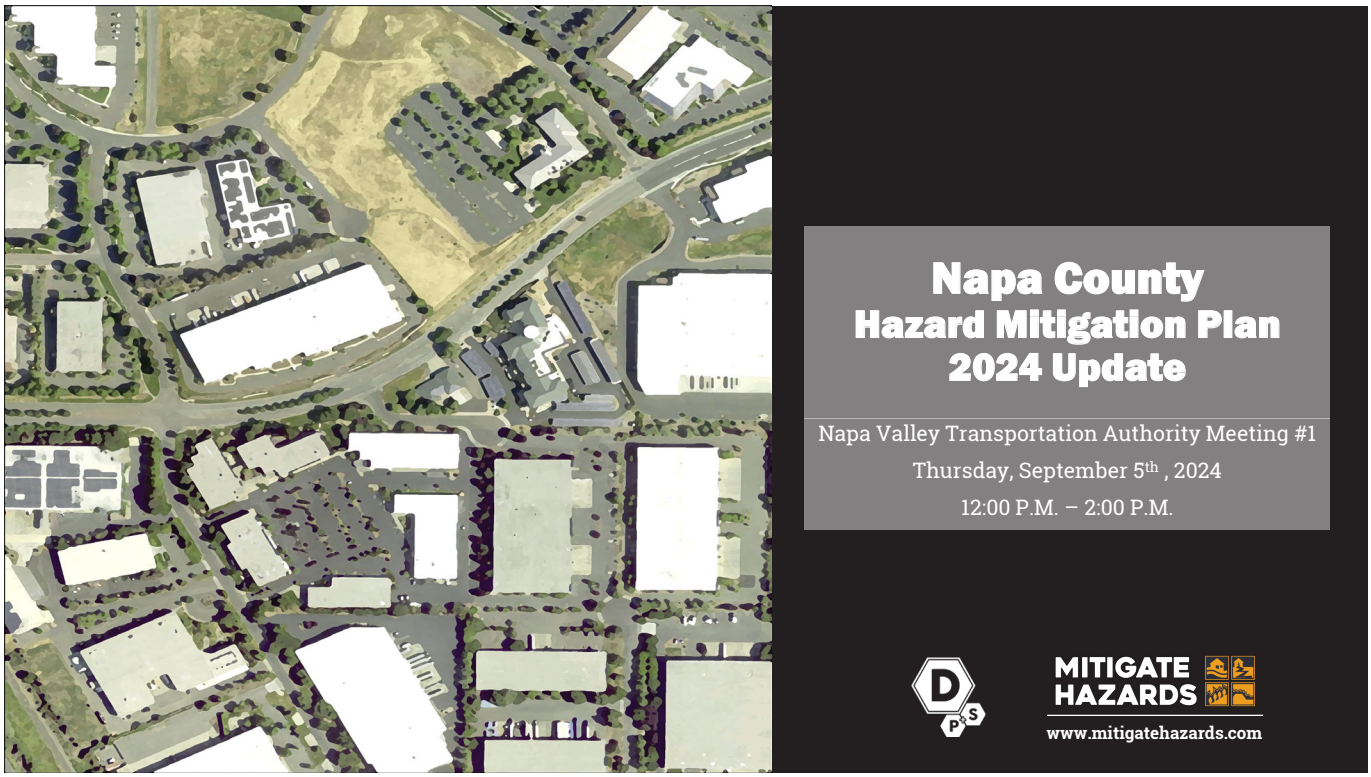
BO 1 NapaSan Zoom



BO 1 NCOE Zoom


Napa County
Hazard Mitigation Plan
2024 Update
Napa Valley College Meeting #1
Wednesday, August 28th , 2024
8:00 A.M. – 10:00 A.M.
MITIGATE HAZARDS
www.mitigatehazards.com

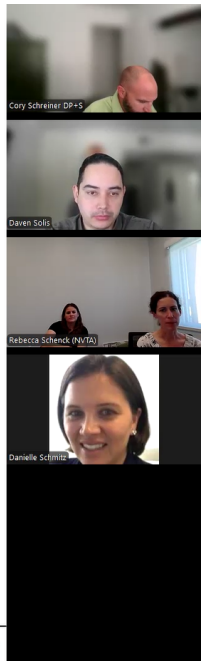
BO 1 NVC Zoom



BO 1 NVTA Meeting Slide

What's Changed for Napa Valley Transportation Since the Last Update?

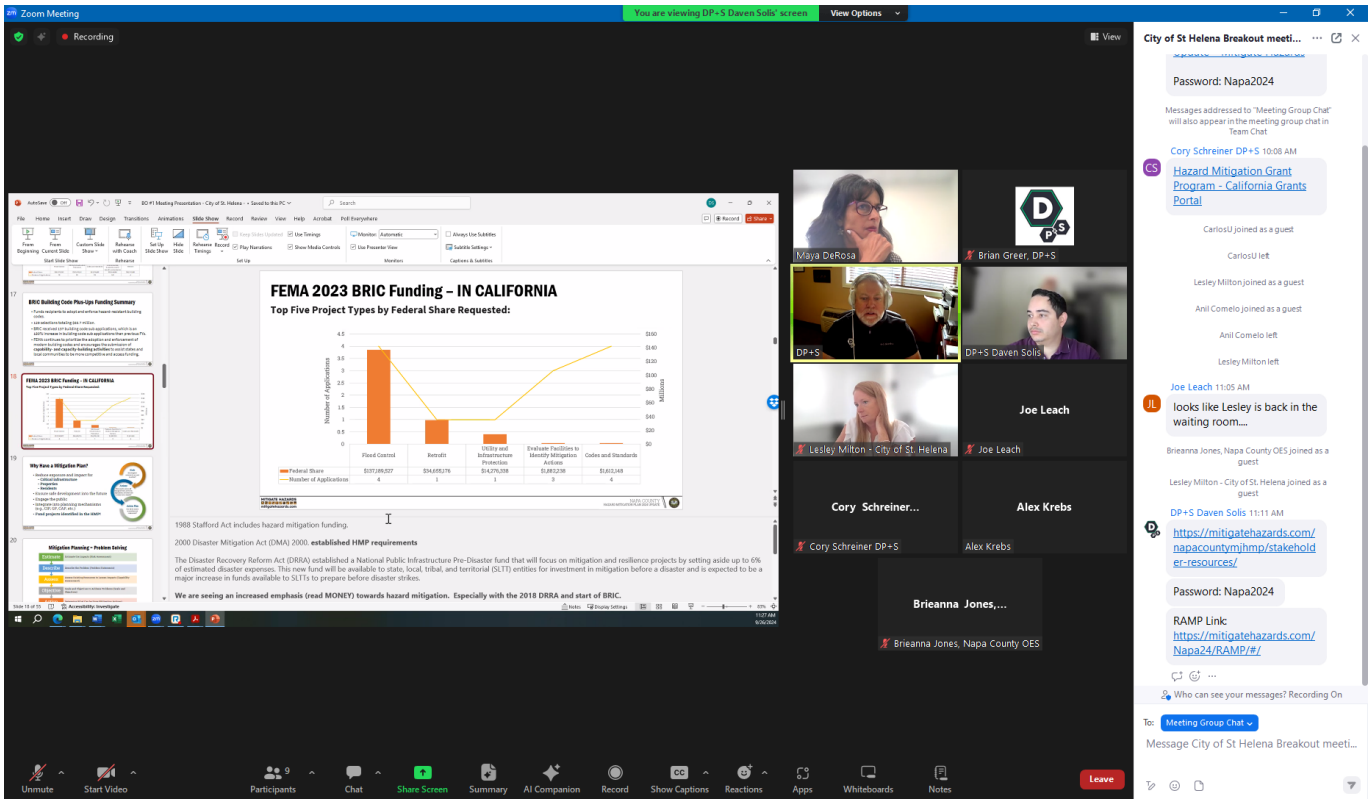
- Success stories / completed mitigation actions?
- Lessons learned from hazard events?
- Changes in priorities / capabilities?
- New Very High Wildfire Severity Zones (VH WSZ) in Local Responsibility Areas (LRA)



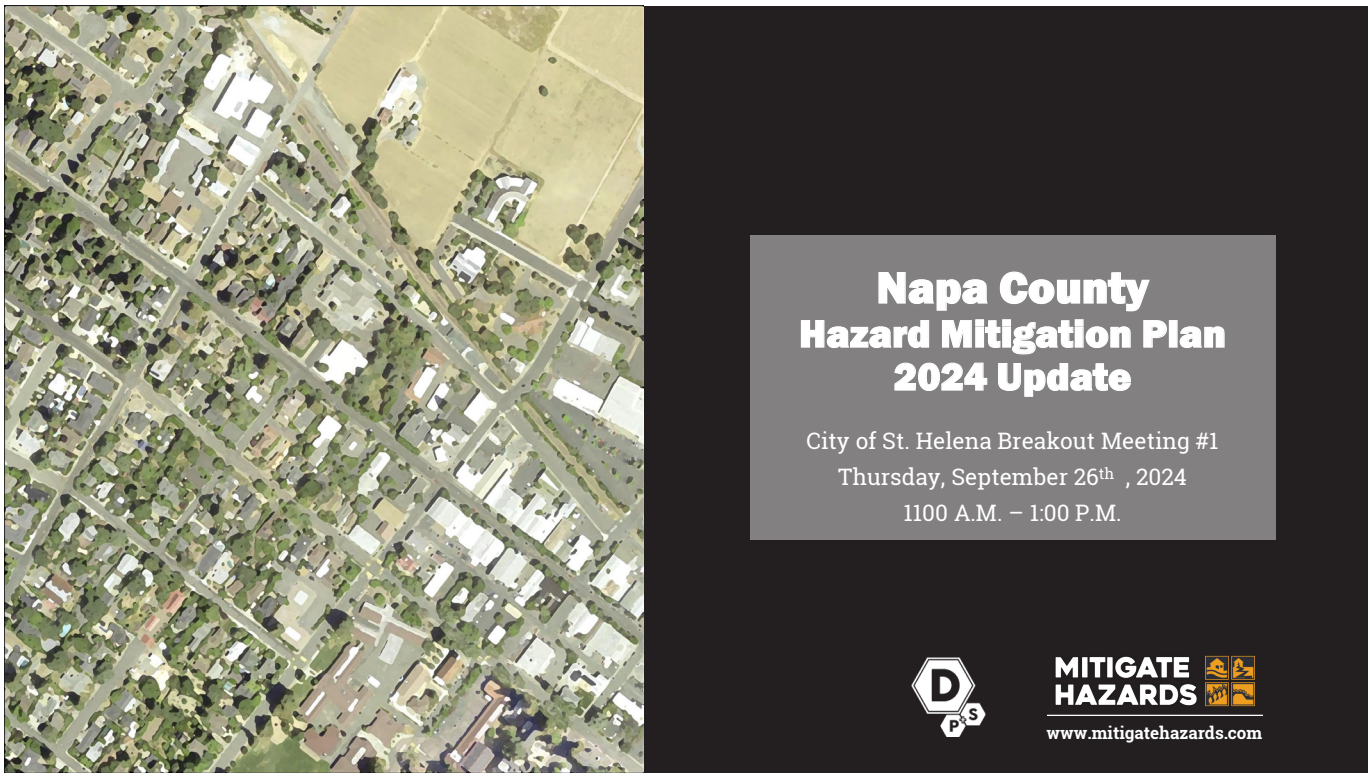
MITIGATE HAZARDS
mitigatehazards.com

NAPA COUNTY
HAZARD MITIGATION PLAN 2024 UPDATE

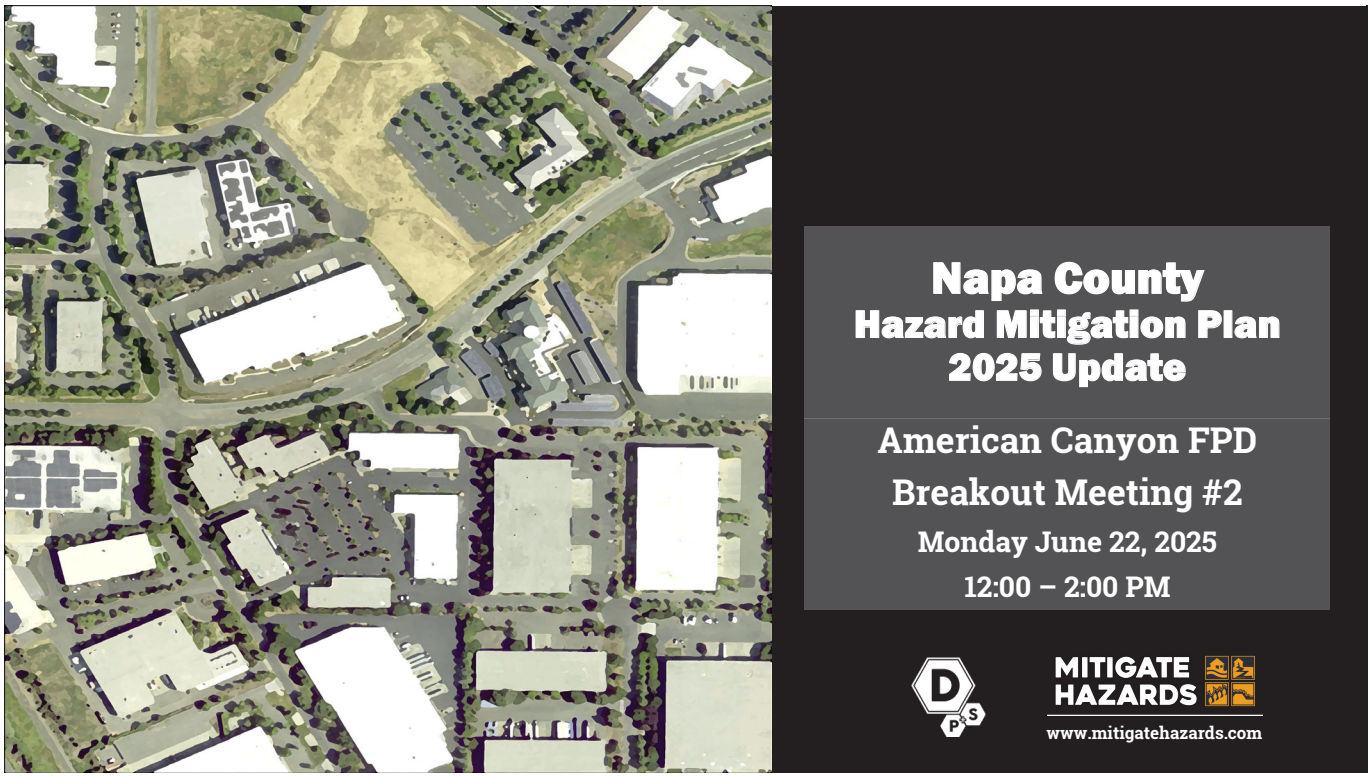
BO 1 NVTA Zoom



BO 1 St Helena Zoom



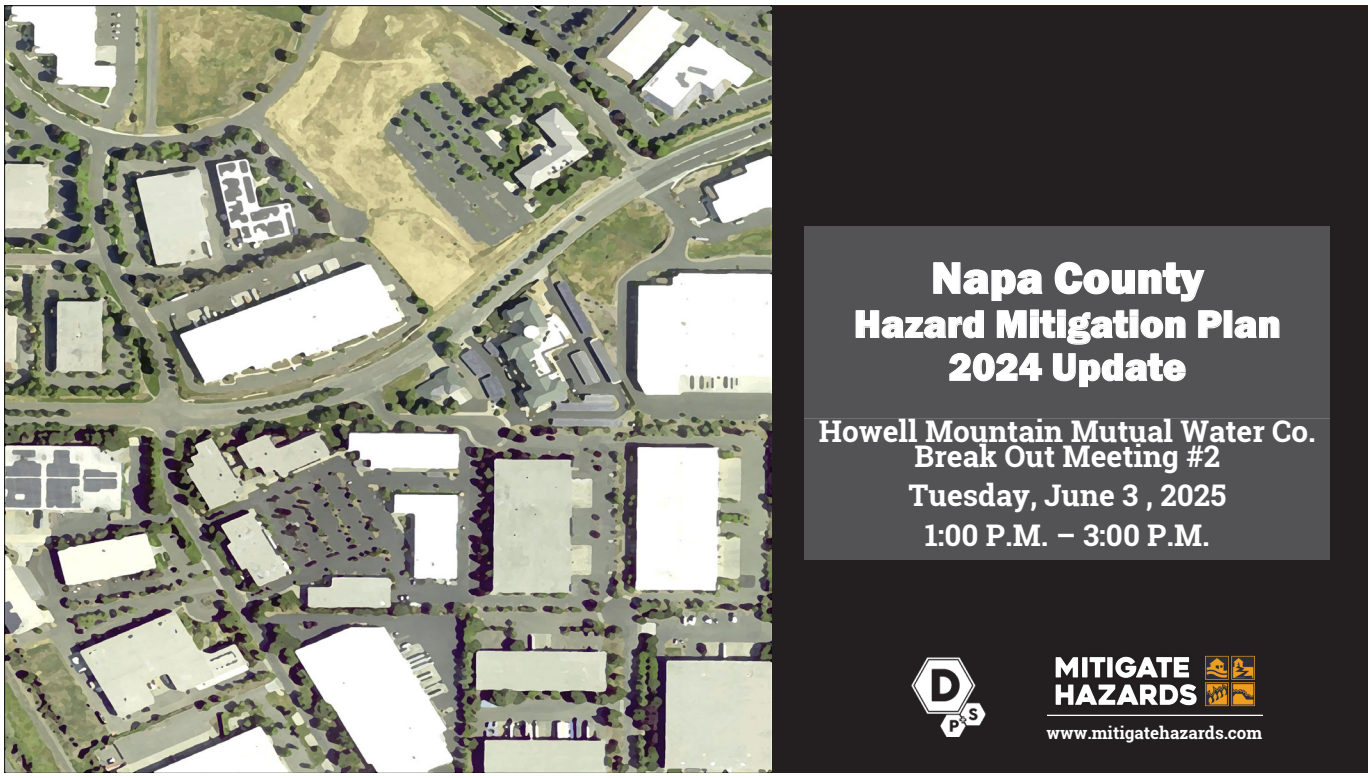
BO 1 St. Helena Meeting Slidepdf



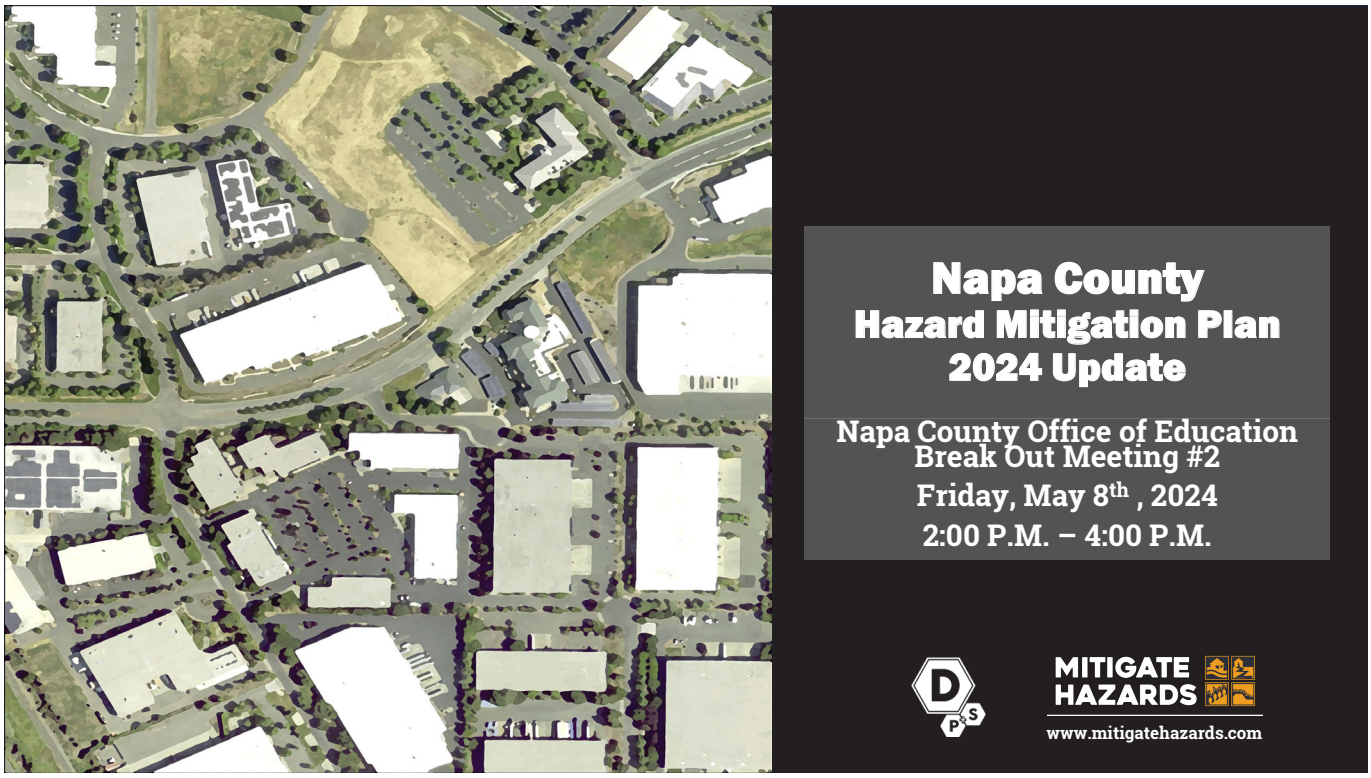
BO 2 ACFPD Slide



BO 2 American Canyon Slide



BO 2 HMMWC Slide



BO 2 Napa COE Slide

NAPA COUNTY
HAZARD MITIGATION PLAN 2025 UPDATE

Jurisdictional Breakout Meeting Series #2 Read-Ahead Packet

Attachment A – Breakout Meeting #2 Details & Agenda
Napa Valley College

Date: Tuesday, August 19, 2025
Time: 10:00A.M. – 12:00 P.M.
Location: Zoom
Meeting ID: 858 7940 4781
Passcode: 482623

Facilitator(s): Dynamic Planning + Science (DP+S), Ethan Mobley, Christopher Velasco

Meeting Purpose

Breakout Meeting #2 is part of Phase 3, Develop the Mitigation Strategy, which is the most important phase of developing the 2025 Napa County Multi-Jurisdictional Hazard Mitigation Plan (MJHMP). This breakout meeting will focus on taking all the information we've previously gathered, discussed, and analyzed, and using it to build an actionable mitigation strategy that addresses the highest priority hazard problems and greatest areas of concern; aligns with community feedback and jurisdictional capabilities; and considers opportunities for multi-jurisdictional collaboration.

At the end of Breakout Meeting #2, participants will:

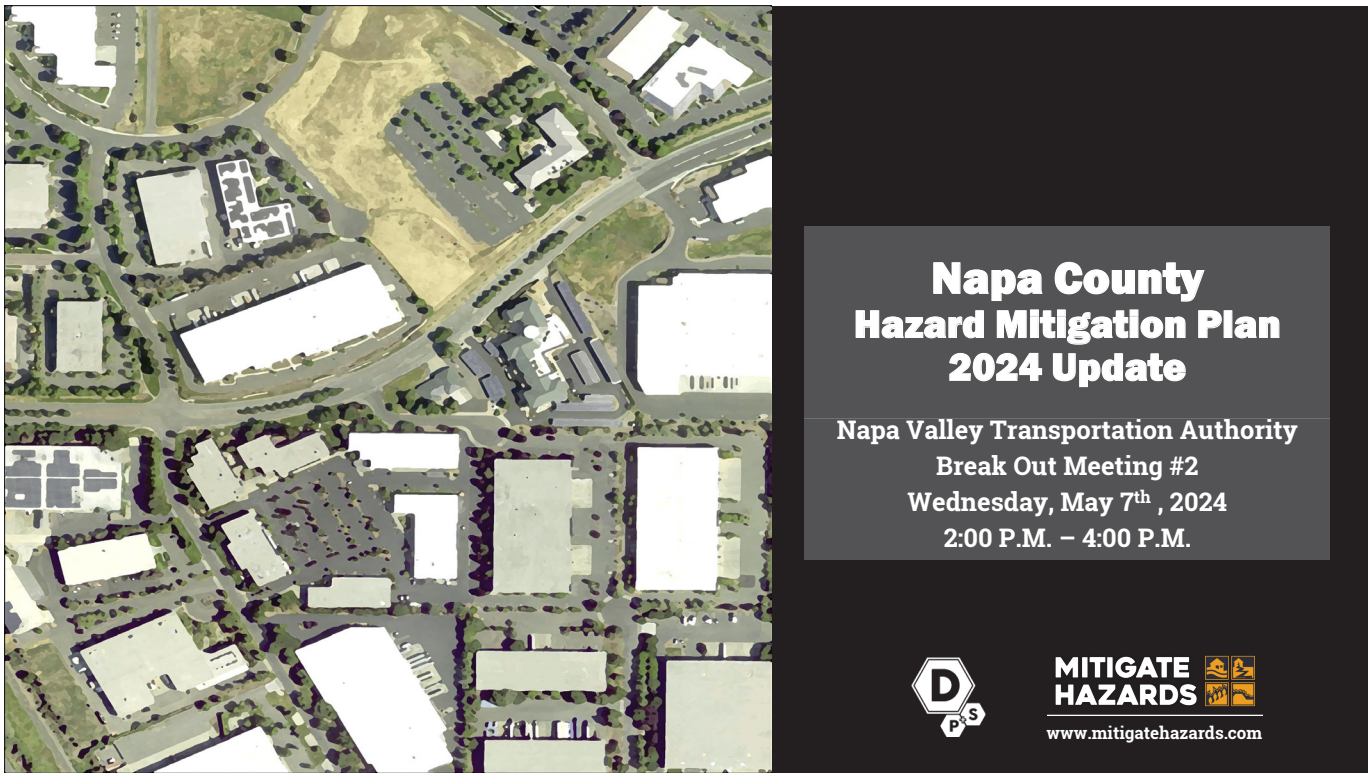
- **Understand and Have Consensus on Jurisdictional Capabilities** in implementing their unique mitigation strategy to address jurisdiction-specific problems and support regional collaboration (see SECTION 2 and Attachment B).
- **Understand and Have Consensus on Jurisdictional Problem Statements** which describe the area(s) of concern (victim, impact, or threat) for high-priority hazards and specific risks that were identified through the risk assessment process, community feedback, and prioritization exercise from Breakout Meeting #1 (see SECTION 3 and Attachment C).
- **Understand and Have Consensus on Jurisdictional Mitigation Actions** that align with local capabilities, community-driven priorities, and FEMA guidelines; address specific problem statements; follow the SMARTIE guidelines and are cost- and resource-effective; and support inter-agency collaboration (see SECTION 4 and Attachment D).

BO 2 NVC Agenda 1

NAPA COUNTY
HAZARD MITIGATION PLAN 2025 UPDATE

Agenda

ID	Time	Action Item	Key Decision / Support Request
1	10 min	**Welcome & Project Updates** Overview of meeting goals, structure, and expected outcomes, and updates on project timeline.	
2	15 min	**Designing the Mitigation Strategy** Recap of the process and considerations for designing the mitigation strategy, including review of the draft capabilities assessment and SMARTIE principles.	Feedback and consensus on capabilities assessment
3	30 min	**Defining the Problem** Overview of areas of concern (AOCs) and review of draft problem statements.	Feedback and consensus on problem statements
4	5 min	**Evaluating Mitigation Alternatives** Overview of mitigation alternatives and potential strategies, projects, and activities.	
5	55 min	**Mitigation Strategy Refine & Align Exercise** Interactive group exercise to review draft mitigation actions to align with jurisdictional capabilities and identified problems.	Feedback and consensus on potential mitigation actions
6	5 min	**Next Steps & Closeout** a) Upcoming public outreach events, HMPT Meeting #4 b) Questions and open discussion	Confirm upcoming tasks and needed follow-up



BO 2 NVTA Slide

Public Notice & Press Release Documentation

Appendix B.2

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www.cityofnapa.org/CivicSend/ViewMessage/message/277443



Senior Center Holiday Luncheon: Dec. 16

Join us for a traditional holiday celebration featuring food, friends, and fun! Enjoy a classic holiday meal with a catered entree, dessert, and beverages completely free thanks to a generous donation from The Table.

The luncheon is open to adults ages 50 and older and will take place on Tuesday, Dec. 16 from 11:30 a.m. to 2 p.m. at the Senior Center Manzanita Room, 1500 Jefferson St.

Registration is required and the deadline is this Monday, Dec. 9. **Reserve your spot**

Public Input Needed: Napa County Hazard Mitigation Survey



Napa County, in partnership with five participating jurisdictions including the City of Napa, is updating the countywide Multi-Jurisdictional Hazard Mitigation Plan. The community is encouraged to share their experiences and concerns about local hazards like wildfires, floods, and earthquakes.

Your input will help local agencies develop strategies to reduce risks from natural disasters and protect our community.

Learn more and take the survey



The City of Napa is Hiring

The City of Napa is looking for qualified and passionate people to join our team and continue to keep the City of Napa one of the best places to live and work!

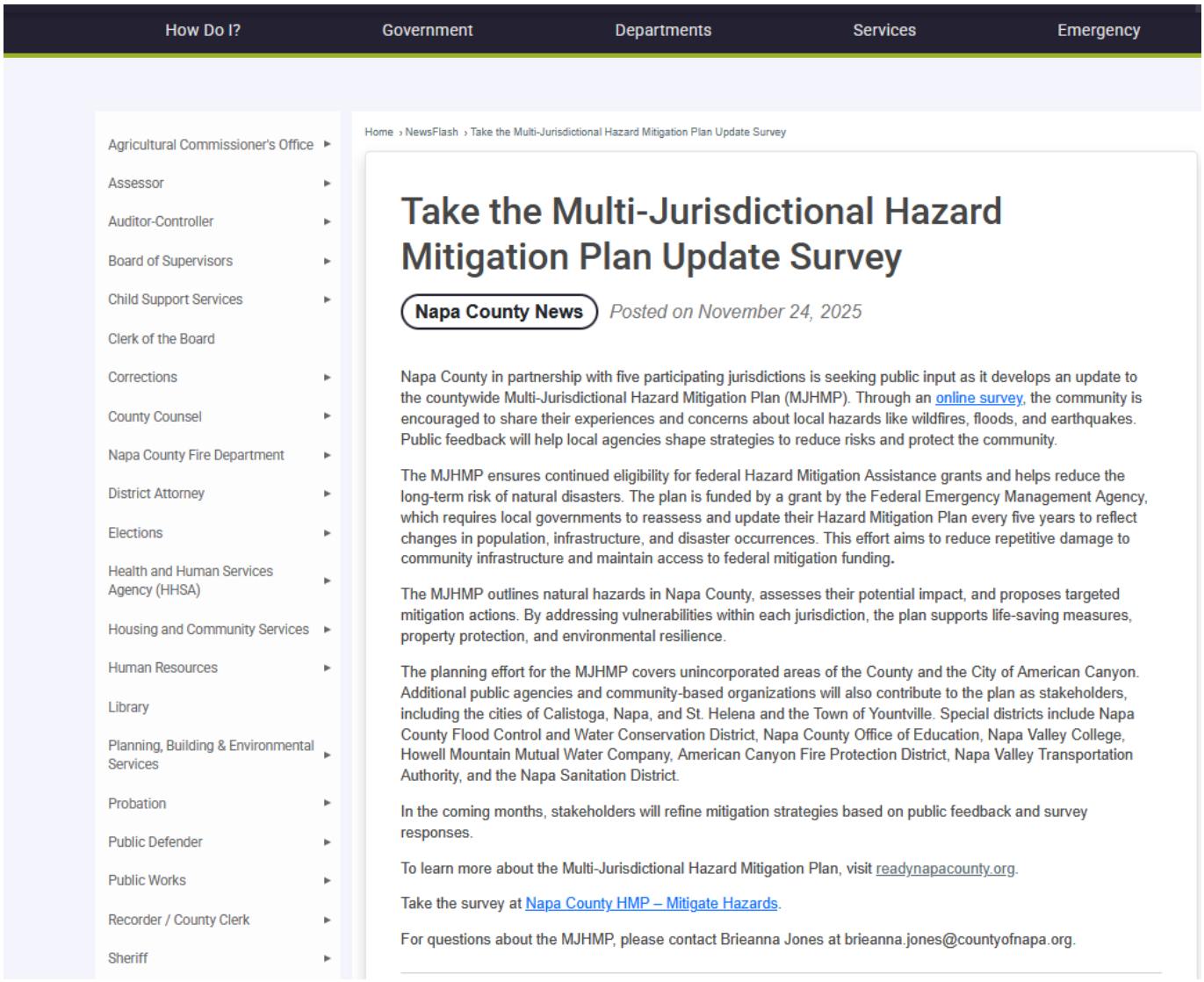
We take pride in hiring highly competent, motivated people whose behavior exemplifies a strong commitment to public service. We hire people with a wide range of strengths and unique experiences, perspectives and ideas. If you have a passion for public service and want the opportunity to serve our community, submit your application today!

Learn more

City Napa Newsetter



Mitigate Banner ReadyNapaCo



How Do I? | Government | Departments | Services | Emergency

- Agricultural Commissioner's Office
- Assessor
- Auditor-Controller
- Board of Supervisors
- Child Support Services
- Clerk of the Board
- Corrections
- County Counsel
- Napa County Fire Department
- District Attorney
- Elections
- Health and Human Services Agency (HHSA)
- Housing and Community Services
- Human Resources
- Library
- Planning, Building & Environmental Services
- Probation
- Public Defender
- Public Works
- Recorder / County Clerk
- Sheriff

Home › NewsFlash › Take the Multi-Jurisdictional Hazard Mitigation Plan Update Survey

Take the Multi-Jurisdictional Hazard Mitigation Plan Update Survey

Napa County News *Posted on November 24, 2025*

Napa County in partnership with five participating jurisdictions is seeking public input as it develops an update to the countywide Multi-Jurisdictional Hazard Mitigation Plan (MJHMP). Through an online survey, the community is encouraged to share their experiences and concerns about local hazards like wildfires, floods, and earthquakes. Public feedback will help local agencies shape strategies to reduce risks and protect the community.

The MJHMP ensures continued eligibility for federal Hazard Mitigation Assistance grants and helps reduce the long-term risk of natural disasters. The plan is funded by a grant by the Federal Emergency Management Agency, which requires local governments to reassess and update their Hazard Mitigation Plan every five years to reflect changes in population, infrastructure, and disaster occurrences. This effort aims to reduce repetitive damage to community infrastructure and maintain access to federal mitigation funding.

The MJHMP outlines natural hazards in Napa County, assesses their potential impact, and proposes targeted mitigation actions. By addressing vulnerabilities within each jurisdiction, the plan supports life-saving measures, property protection, and environmental resilience.

The planning effort for the MJHMP covers unincorporated areas of the County and the City of American Canyon. Additional public agencies and community-based organizations will also contribute to the plan as stakeholders, including the cities of Calistoga, Napa, and St. Helena and the Town of Yountville. Special districts include Napa County Flood Control and Water Conservation District, Napa County Office of Education, Napa Valley College, Howell Mountain Mutual Water Company, American Canyon Fire Protection District, Napa Valley Transportation Authority, and the Napa Sanitation District.

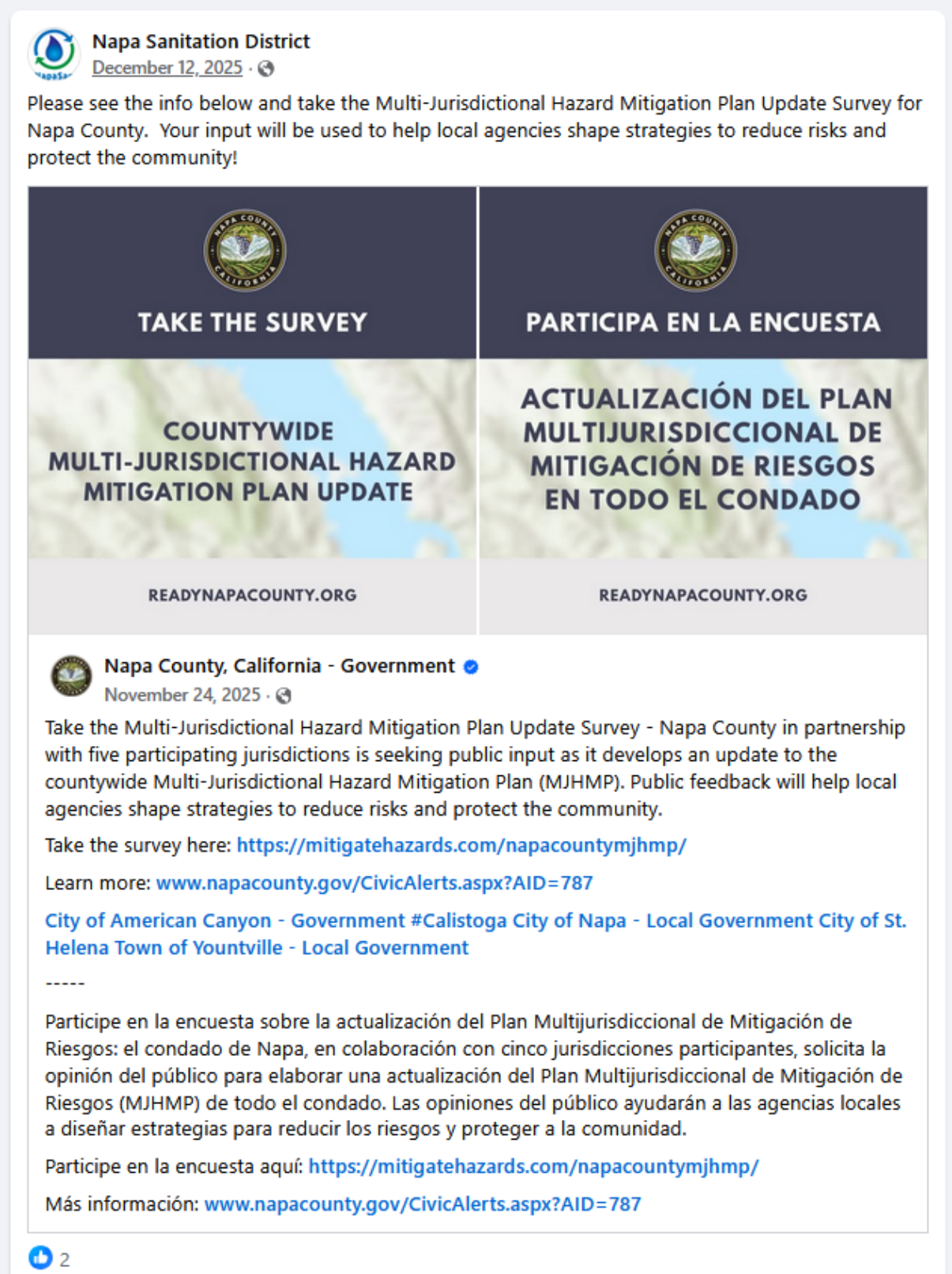
In the coming months, stakeholders will refine mitigation strategies based on public feedback and survey responses.

To learn more about the Multi-Jurisdictional Hazard Mitigation Plan, visit readynapacounty.org.

Take the survey at Napa County HMP – Mitigate Hazards.

For questions about the MJHMP, please contact Brieanna Jones at brieanna.jones@countyofnapa.org.

Napa County Webpage



Napa Sanitation District
December 12, 2025 ·

Please see the info below and take the Multi-Jurisdictional Hazard Mitigation Plan Update Survey for Napa County. Your input will be used to help local agencies shape strategies to reduce risks and protect the community!

Napa County, California - Government
November 24, 2025 ·

Take the Multi-Jurisdictional Hazard Mitigation Plan Update Survey - Napa County in partnership with five participating jurisdictions is seeking public input as it develops an update to the countywide Multi-Jurisdictional Hazard Mitigation Plan (MJHMP). Public feedback will help local agencies shape strategies to reduce risks and protect the community.

Take the survey here: https://mitigatehazards.com/napacountymjhmp/

Learn more: www.napacounty.gov/CivicAlerts.aspx?AID=787

City of American Canyon - Government #Calistoga City of Napa - Local Government City of St. Helena Town of Yountville - Local Government

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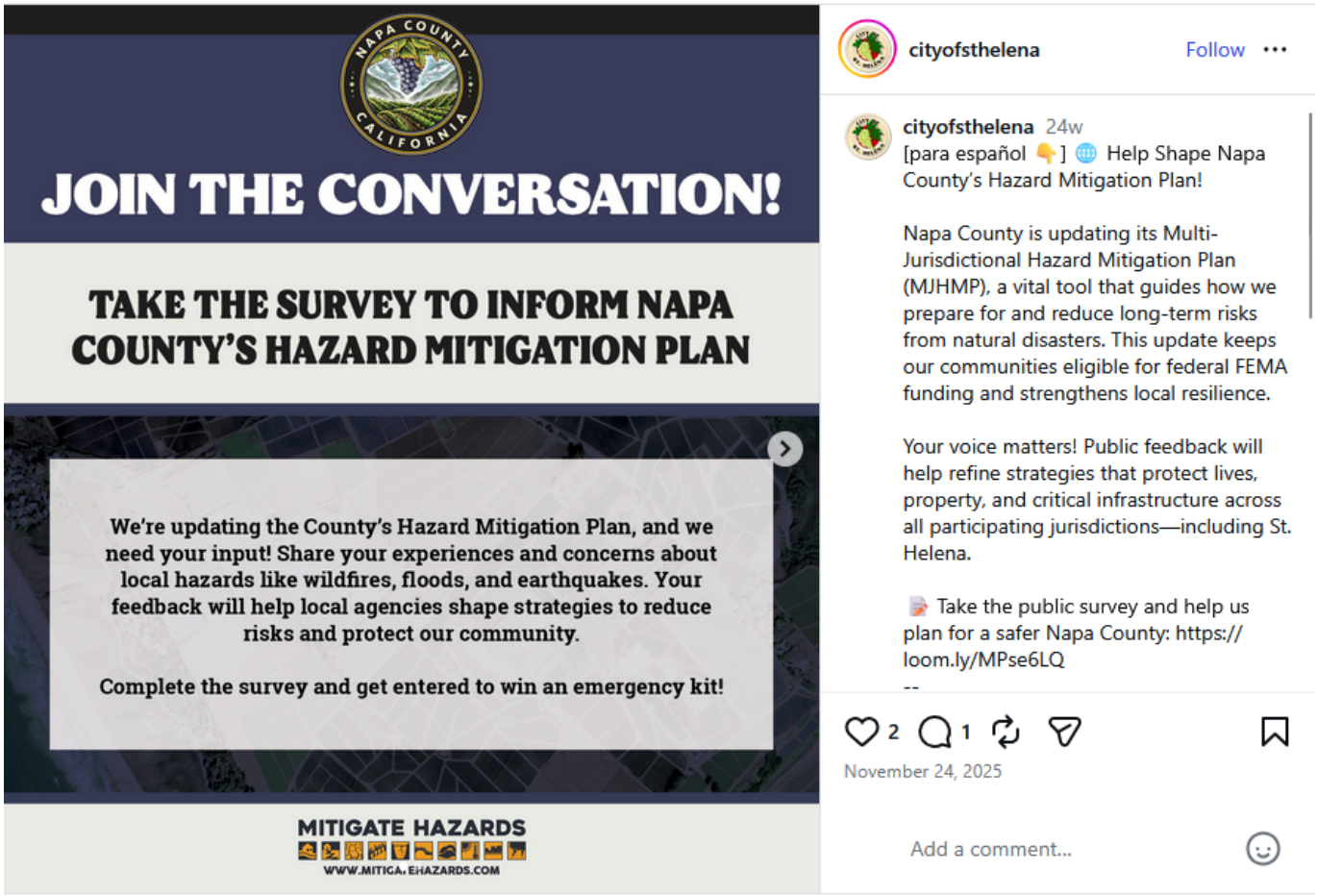
Participe en la encuesta sobre la actualización del Plan Multijurisdiccional de Mitigación de Riesgos: el condado de Napa, en colaboración con cinco jurisdicciones participantes, solicita la opinión del público para elaborar una actualización del Plan Multijurisdiccional de Mitigación de Riesgos (MJHMP) de todo el condado. Las opiniones del público ayudarán a las agencias locales a diseñar estrategias para reducir los riesgos y proteger a la comunidad.

Participe en la encuesta aquí: https://mitigatehazards.com/napacountymjhmp/

Más información: www.napacounty.gov/CivicAlerts.aspx?AID=787

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NapaSan Facebook Post



St Helena Instagram Post

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Survey & Results Documentation

Appendix B.3

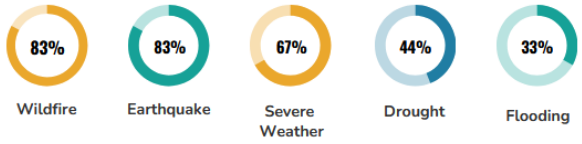
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PUBLIC SURVEY SUMMARY REPORT

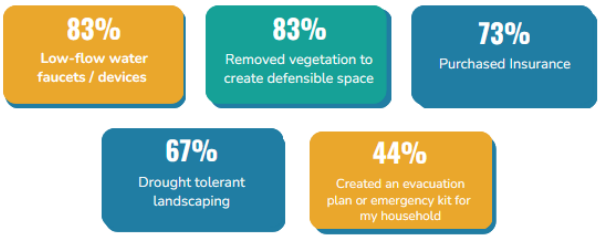
Community Feedback Survey

75
TOTAL RESPONSES

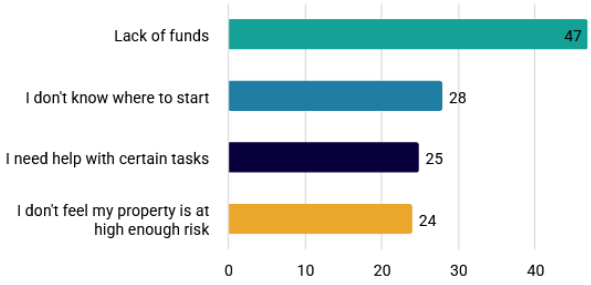
Which of the following hazards have you or your household experienced?



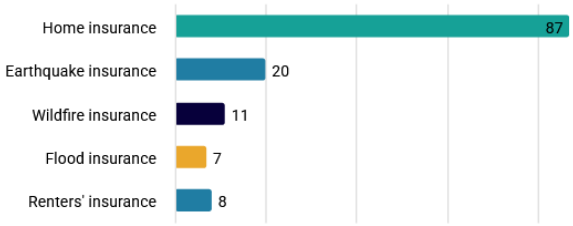
What actions have you taken to protect your home?



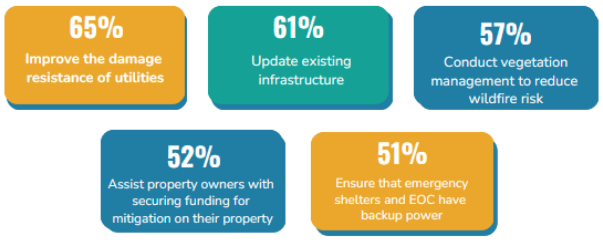
What barriers do you face in taking action?



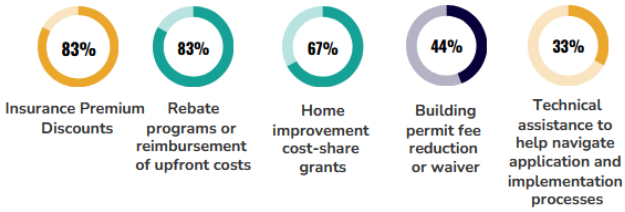
What barriers do you face in taking action?



What actions do you believe the county should take?



Which of the following incentives would encourage your participation in mitigation efforts?



Napa County Survey Summary

Napa County 2025 Hazard Mitigation Plan Update

Welcome and thank you for participating in this public survey!

This survey will help inform development of the Napa County Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) 2025 update. **Hazard mitigation** is the use of sustained, long-term actions to reduce the loss of life, personal injury, and property damage that can result from a natural disaster.

This questionnaire is designed to obtain your opinion about hazards and safety concerns in the area and what types of mitigation measures should be carried out by the city. The information you provide will help us identify policies and coordinate projects focused on reducing the risk of injury or damage to property from hazard events (e.g. earthquakes, wildfire, flood).

The survey should take approximately 5-10 minutes to complete and is anonymous. Please provide your email if you would like to be entered into a drawing for a gift card towards a home mitigation use item! View results and learn more about the planning process at our project website, **mitigatehazards.com/napacountymjhmp/.**

* Indicates required question

1. Please provide us with your email to be entered into prize drawing. (Optional)

2. Do you live or work in Napa County? *

Mark only one oval.

- ◯ I live in Napa County *Skip to question 3*
- ◯ I work in Napa County *Skip to question 5*
- ◯ I live and work in Napa County *Skip to question 3*
- ◯ Neither, but I'm interested in risks affecting Napa County. *Skip to question 5*

3. Where do you live and/or own property? *

Mark only one oval.

- ◯ Unincorporated Napa County
- ◯ City of Napa
- ◯ City of St. Helena
- ◯ City of American Canyon
- ◯ Town of Yountville
- ◯ City of Calistoga
- ◯ Other: _____

4. Do you rent or own your home?

Mark only one oval.

- ◯ Rent
- ◯ Own
- ◯ Other: _____

5. What is your age range?

Mark only one oval.

- ◯ Under 18
- ◯ 18-30
- ◯ 31-40
- ◯ 41-50
- ◯ 51-60
- ◯ 61-70
- ◯ 71-80
- ◯ 81 or older

Survey Print Version Napa County 2025 Hazard Mitigation Plan Update

6. How many individuals currently live in your household?

Mark only one oval.

- 1
- 2
- 3
- 4
- 5 or more

7. Do you feel well informed about the dangers of natural disasters in this area? *

Mark only one oval.

- Yes
- No
- Somewhat

8. In your opinion, how vulnerable do you believe your property/home is to **damage** * from a natural disaster event?
Examples include earthquake, flooding, drought, wildfire, climate change, etc.

Mark only one oval.

	1	2	3	4	5	
Not at all vulnerable						Extremely vulnerable

9. How prepared is your household or business to **evacuate** during an emergency * event?

Mark only one oval.

	1	2	3	4	5	
A.						B.

A. Not prepared at all (I wouldn't know where to start)

B. Extremely prepared (I know my evacuation routes/zone and have a plan)

Survey Print Version Napa County 2025 Hazard Mitigation Plan Update

10. Which of the following types of events have **you or someone in your household experienced** in Napa County in the last 20 years? (Check all that apply)

Check all that apply.

- [ ] Earthquake
- [ ] Wildfire
- [ ] Severe Weather (e.g., heavy rain, high heat, high wind)
- [ ] Flooding
- [ ] Drought
- [ ] Landslide / Slope Failure
- [ ] Dam / Levee Failure
- [ ] None of the above.
- [ ] Other: _____

11. Rate your perception of **how high a threat** each hazard below poses to Napa County. (Pick one per row)

Mark only one oval per row.

	(1) Very low	(2) Low	(3) Moderate	(4) High	(5) Very high
Earthquake:	◯	◯	◯	◯	◯
Wildfire:	◯	◯	◯	◯	◯
Severe weather:	◯	◯	◯	◯	◯
Flooding:	◯	◯	◯	◯	◯
Drought:	◯	◯	◯	◯	◯
Landslide:	◯	◯	◯	◯	◯
Dam Failure:	◯	◯	◯	◯	◯
Extreme Heat:	◯	◯	◯	◯	◯

12. What **actions have you taken** for your home or property to **reduce risk** of damage or injury from potential disasters? (Check all that apply)

Check all that apply.

- [ ] Purchased insurance
- [ ] Fire-resistant design or materials (e.g., siding, decking, window replacement)
- [ ] Removed vegetation to create defensible space
- [ ] Drought tolerant landscaping
- [ ] Low-flow water faucets / devices (for water conservation)
- [ ] Flood-proofing measures or drainage improvements
- [ ] Registered for Code Red Emergency Alerts
- [ ] Secured backup power supply
- [ ] Created an evacuation plan and/or emergency kit for my household
- [ ] (Renters) Asked property owner / landlord to implement any of the above measures
- [ ] Other: _____

13. What kind of **insurance policies**, if any, do you have to protect your home or property? Check all that apply.

Check all that apply.

- [ ] Home insurance
- [ ] Renters' insurance
- [ ] Flood insurance
- [ ] Earthquake insurance
- [ ] Wildfire insurance
- [ ] Other: _____

14. How confident do you feel about your **financial preparedness** to handle unexpected expenses during a disaster or emergency situation?

Mark only one oval.

- ◯ Extremely Confident
- ◯ Confident
- ◯ Neutral / Unsure
- ◯ Not Very Confident
- ◯ Zero Confidence

15. What **barriers**, if any, do you face in taking action to reduce your property's risk to natural hazards/disasters? Check all that apply.

Check all that apply.

- ☐ Lack of funds
- ☐ I wouldn't know where to start / I need more information
- ☐ I need help with certain physical tasks
- ☐ I don't feel that my property is at high enough risk
- ☐ Other: _____

16. Which of the following **incentives** would encourage you to protect your home to withstand the impacts of possible hazards? (Check all that apply)

(Examples: structural retrofits for earthquake, installation of low-flow plumbing fixtures, drainage improvements or flood-proofing, etc.)

Check all that apply.

- ☐ Low interest home improvement loans
- ☐ Home improvement cost-share grants
- ☐ "Rebate" programs or reimbursement of upfront costs
- ☐ Insurance premium discounts
- ☐ Technical assistance to help navigate application and implementation processes
- ☐ Labor assistance for installation of improvements
- ☐ Building permit fee reduction or waiver
- ☐ Other: _____

17. Which of the following actions do you believe the **County** should focus on to reduce disruption of services, increase safety, and strengthen the community? (Check all that apply)

Check all that apply.

- [ ] Retrofit and strengthen critical facilities (e.g., police, fire stations, hospitals, schools)
- [ ] Update existing infrastructure (e.g., sewer, stormwater/drainage systems, bridges and roadways)
- [ ] Improve the damage resistance of utilities (e.g., electricity, communications, water/wastewater facilities)
- [ ] Ensure that emergency shelters, the Emergency Operations Center, and communications towers have backup power
- [ ] Strengthen codes and ordinances to require higher hazard risk management standards
- [ ] Provide better information to the public about hazard risk, high-hazard areas, and ways to reduce/mitigate risk
- [ ] Assist property owners with securing funding to mitigate impacts to their properties (e.g., earthquake retrofits, cooling upgrades)
- [ ] Developing additional green spaces and installing drought-resistant vegetation along roadways and sidewalks
- [ ] Conduct vegetation management (i.e., disking, grazing, landscape restoration) in open space areas to reduce wildfire risk to neighboring homes
- [ ] None / No Action
- [ ] Other: _____

18. Thank you again for completing the survey! Please provide any additional questions, comments, or concerns that you may have regarding hazard mitigation and community protection against disasters.

_____

_____

_____

_____

_____

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Survey Print Version Napa County 2025 Hazard Mitigation Plan Update

Actualización del Plan de Mitigación de Riesgos del Condado de Napa 2025

¡Bienvenido y gracias por participar en esta encuesta pública!

Esta encuesta ayudará a informar el desarrollo de la actualización 2025 del Plan de Mitigación de Riesgos Multijurisdiccional del Condado de Napa (MJHMP). La mitigación de riesgos es el uso de acciones sostenidas y a largo plazo para reducir la pérdida de vidas, lesiones personales y daños a la propiedad que pueden resultar de un desastre natural.

Este cuestionario está diseñado para obtener su opinión sobre los peligros y preocupaciones de seguridad en la zona y qué tipos de medidas de mitigación deberían llevarse a cabo por la ciudad. La información que proporcione nos ayudará a identificar políticas y coordinar proyectos enfocados en reducir el riesgo de lesiones o daños a la propiedad por eventos de riesgo (por ejemplo, terremotos, incendios forestales, inundaciones).

La encuesta debería tardar aproximadamente entre 5 y 10 minutos en completarse y es anónima. ¡Proporcione su correo electrónico si desea participar en el sorteo de un kit de emergencia para su hogar! Vea los resultados y obtenga más información sobre el proceso de planificación en el sitio web de nuestro proyecto, mitigatehazards.com/napacountymjhmp/.

* Indicates required question

1. Por favor complete todas las preguntas de la encuesta completamente. Gracias por su participación.

2. ¿Dónde vive y/o povecinasee propiedad? *

   Mark only one oval.

   - ( ) * Condado de Napa no incorporado (vea la pregunta a continuación)
   - ( ) Ciudad de American Canyon
   - ( ) Ciudad de Calistoga
   - ( ) Ciudad de Napa
   - ( ) Ciudad de Yountville
   - ( ) Otro condado o ciudad vecina

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3. ¿Usted renta o posee su propio hogar?

Mark only one oval.

- ◯ Renta
- ◯ Hogar propio
- ◯ Other: _____

4. ¿Cuál es su rango de edad?

Mark only one oval.

- ◯ Menos de 18
- ◯ 18-30
- ◯ 31-40
- ◯ 41-50
- ◯ 51-60
- ◯ 61-70
- ◯ 71-80
- ◯ 81 o más

5. ¿Cuántas personas viven actualmente en su hogar?

Mark only one oval.

- ◯ 1
- ◯ 2
- ◯ 3
- ◯ 4
- ◯ 5 o más

6. ¿Te sientes bien informado sobre los peligros de los desastres naturales en esta área? *

Mark only one oval.

- ◯ Sí
- ◯ No
- ◯ Algo

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7. En tu opinión, ¿qué tan vulnerable crees que es tu propiedad/casa al daño por un evento de desastre natural? *

Los ejemplos incluyen terremotos, inundaciones, sequías, incendios forestales, cambio climático, etc.
Califica en la escala del 1 al 5:

Mark only one oval.

	1	2	3	4	5	
Nada vulnerable	◯	◯	◯	◯	◯	Extremadamente vulnerable

8. ¿Qué tan preparado está tu hogar o negocio para evacuar durante un evento de emergencia? *
Califica en la escala del 1 al 5:

Mark only one oval.

	1	2	3	4	5	
A.	◯	◯	◯	◯	◯	B.

A. No preparado en absoluto (no sabría por dónde empezar)
B. Extremadamente preparado (conozco mis rutas / zona de evacuación y tengo un plan)

9. ¿Qué tipo de eventos has experimentado tú o alguien en tu hogar en el condado de Napa en los últimos 20 años? (Marca todas las que apliquen)

Check all that apply.

- [ ] Terremoto
- [ ] Incendio forestal
- [ ] Vientos fuertes
- [ ] Calor extremo
- [ ] Inundaciones
- [ ] Sequía
- [ ] Deslizamiento de tierra / Fallo de talud / Fallo del banco del arroyo
- [ ] Tsunami
- [ ] Oleaje de tormenta costera
- [ ] Ninguna de las anteriores.
- [ ] Other: _____

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10. Evalúa tu percepción sobre cuán alta es la amenaza que representa cada uno de los peligros a continuación para el condado de Napa. (Elija uno por fila y califique en la escala del 1 al 5)

Mark only one oval per row.

	(1) Muy bajo	(2) Bajo	(3) Moderado	(4) Alto	(5) Muy alto
Terremoto:					
Incendio forestal:					
Vientos fuertes					
Calor extremo					
Inundaciones:					
Sequía:					
Deslizamiento de tierra / Fallo de talud / Fallo del banco del arroyo					
Tsunami					
Oleaje de tormenta costera					

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11. ¿Qué acciones has tomado para tu hogar o propiedad para reducir el riesgo de daño o lesión por desastres potenciales? (Marca todas las que apliquen)

Check all that apply.

- [ ] Póliza de seguro de propietarios / inquilinos comprados
- [ ] Instalación de revestimientos y techos resistentes al fuego para la defensa contra incendios forestales.
- [ ] Reducción de la vegetación alrededor de la casa para la defensa de incendios forestales.
- [ ] Instalacion de energía alternativa; Generadores, batería / respaldo solar.
- [ ] Instalacion de plantas tolerantes a la sequía instaladas o paisajismo.
- [ ] Medidas de protección contra inundaciones (horno elevador, calentadores de agua, paneles eléctricos)
- [ ] Instalacion de dispositivos de agua de bajo flujo para duchas, y baños.
- [ ] Medidas de protección contra inundaciones en el sótano (bombas de sumidero, pintura / barreras a prueba de agua)
- [ ] Pidió al propietario que realice cualquiera de las medidas de mitigación mencionadas anteriormente
- [ ] Otro
- [ ] Other: _____

12. ¿Qué tipo de pólizas de seguro, si las hay, tienes para proteger tu hogar o propiedad? Marca todas las que apliquen.

Check all that apply.

- [ ] Seguro de hogar
- [ ] Seguro para inquilinos
- [ ] Seguro contra inundaciones
- [ ] Seguro de terremoto
- [ ] Seguro de incendio forestal - Plan FAIR de California
- [ ] Seguro de incendio forestal - otra opción del mercado privado
- [ ] Sin seguro
- [ ] Other: _____

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13. ¿Qué tan seguro te sientes sobre tu preparación financiera para manejar gastos inesperados durante un desastre o situación de emergencia?

Mark only one oval.

- ◯ Extremadamente seguro
- ◯ Seguro
- ◯ Neutral / No seguro
- ◯ No muy seguro
- ◯ Cero confianza

14. ¿Qué barreras, si las hay, enfrenta para tomar medidas para reducir el riesgo de su propiedad ante desastres/naturales? Marque todas las que correspondan.

Check all that apply.

- ☐ Falta de fondos
- ☐ No sabría por dónde empezar / Necesito más información
- ☐ Necesito ayuda con ciertas tareas físicas
- ☐ No siento que mi propiedad esté en un riesgo lo suficientemente alto
- ☐ Siento que el riesgo que enfrenta mi propiedad está más allá de mi control y no puede ser reducido
- ☐ Other: _____

15. ¿Cuál de los siguientes incentivos lo alentaría a proteger su hogar para resistir los impactos de posibles peligros? (Marque todos los que correspondan)

(Ejemplos: modernizaciones estructurales para terremotos, creación de un espacio definible de endurecimiento del hogar, mejoras de drenaje o protección contra inundaciones/elevación)

Check all that apply.

- ☐ Préstamos para mejoras en el hogar a bajo interés
- ☐ Subvenciones compartidas para proyectos de mitigación (la agencia selecciona al contratista; el propietario paga parte del costo)
- ☐ Programas de reembolso o reembolsos de costos iniciales (el propietario selecciona al contratista, la agencia reembolsa parte del costo)
- ☐ Descuentos en primas de seguros o reintegro de pólizas canceladas
- ☐ Asistencia técnica o evaluación de propiedades
- ☐ Asistencia laboral para la instalación de mejoras
- ☐ Reducción o exención de tasas de permisos de construcción
- ☐ Other: _____

16. ¿En cuáles de las siguientes acciones cree que las agencias públicas en el Condado de Napa deberían centrarse para reducir la interrupción de los servicios, aumentar la seguridad y fortalecer la comunidad? (Marque todas las que correspondan)

Check all that apply.

- [ ] Refuerzo y modernización de instalaciones críticas (p. ej., comisarías, estaciones de bomberos, hospitales, escuelas, refugios de emergencia)
- [ ] Actualizar la infraestructura existente - canalización de aguas residuales/agua
- [ ] Actualizar la infraestructura existente - sistemas de escorrentía/pluviales
- [ ] Actualizar la infraestructura existente - puentes y carreteras
- [ ] Desarrollar capacidad de almacenamiento de agua adicional y conectividad (p. ej. para extinción de incendios y sequía)
- [ ] Asegurarse de que los refugios de emergencia, el Centro de Operaciones de Emergencia y las torres de comunicaciones tengan energía de respaldo
- [ ] Fortalecer los códigos y ordenanzas del Condado y la ciudad para exigir estándares de gestión de riesgos de alto peligro más altos para nuevos y existentes desarrollos
- [ ] Proporcionar mejor información al público sobre el riesgo de peligros, áreas de alto peligro y formas de reducir/mitigar el riesgo
- [ ] Ayudar a los propietarios a asegurar financiamiento para mitigar impactos en sus propiedades (p. ej., refuerzos sísmicos, espacio defendible/endurecimiento del hogar, impermeabilización contra inundaciones)
- [ ] Mejorar la seguridad y capacidad de los corredores de evacuación críticos
- [ ] Programa de compra voluntaria para propiedades ubicadas en áreas de alto riesgo del condado
- [ ] Ninguno / Sin Acción
- [ ] Other: _____

17. ¡Gracias nuevamente por completar la encuesta! Proporcione cualquier pregunta, comentario o inquietud adicional que pueda tener sobre la mitigación de peligros y la protección comunitaria contra desastres.

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Mitigation Strategy Prioritization Process Documentation

Appendix B.4

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Napa PC4 Mitigation Action Hexagon Exercise



Napa PC4 Mitigation Action Hexagon Exercise

City of Calistoga
Alternative Mitigation Actions Considered

Hazard	Action ID (Existing ID or "New")	Action Title	Description	SMARTIE Implementation Details	Selected FEMA Mitigation Alternative(s)	Priority	VALIDATION FIELD (Retain, Revise, Delete)
Wildfire	**CL-08-2020 & CL-04-2020 (Revised)**	Defensible Space & Fuel Break Enhancement	In coordination with the CWPP and Fire Safe Council, implement fuel-reduction and defensible space projects in WUI areas and near critical facilities, and establish an ongoing maintenance program.	**S:** Treat 50+ acres of priority WUI zones and establish maintenance cycle. **M:** Annual acres treated. **A:** Fire Dept + CalFire grant partners. **R:** Reduces risks to people and infrastructure. **T:** Initial by 2028, establish defensible spaces by 2030, ongoing maintenance. **I:** Coordinate through Firewise groups. **E:** Prioritize treatment around facilities that serve vulnerable populations.	SP, NRP	High	revise
Wildfire	**CL-06-2013 (Revised)**	Wildfire Preparedness & Prevention Outreach Program	Establish an outreach program focused on wildfire preparedness and prevention, including addressing human causes of ignition, evacuation preparedness, home mitigation methods (structure hardening, defensible space), and available mitigation resources and incentives.	**S:** Create resources webpage and mitigation incentives, and host annual workshops. **M:** Number of participants. **A:** OES, Planning & Building, and RCD collaboration. **R:** Increases community awareness and preparedness. **T:** Establish by 2028. **I:** Partner with RCD and schools. **E:** Provide technical assistance to low-income participants.	PE&A	High	
Wildfire							Need to Add Action item Improving utilities - Lack of water suppression due to aging/old pipes not sufficient to provide higher pressures and flows, lack of looping to improve water supply, materials of pipe not fire resistant, need to increase water delivery.
Drought	**NEW DR-01-2025**	Water Conservation Outreach Program	Expand outreach on water conservation practices, drought-resilient landscaping, and plumbing fixture upgrade resources for residents and businesses.	**S:** Create resources webpage and host annual workshops. **M:** Gallons saved per year. **A:** Public Works & RCD collaboration. **R:** Increases long-term water supply sustainability **T:** Establish by 2028. **I:** Partner with schools and ag community. **E:** Provide fixture upgrade rebates for low-income participants.	PE&A	High	
Drought	**CL-09-2020 (Revised)**	Water Supply Contingency & Storage Expansion	Implement water supply contingency projects, such as increasing water supply delivery, storage, and treatment capacity at Kimball Reservoir and Water Treatment Plant, to improve resilience during drought years.	**S:** Design and construct 1 project by 2032. **M:** Gallons of added capacity. **A:** Leverage SRF and CalOES grants. **R:** Addresses primary water reliability concern. **T:** Begin by 2029. **I:** Coordinate with Napa County GSA. **E:** Ensure ratepayer equity in funding structure.	SP	Medium	

Jed Matcham
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Raini Ott
Deleted: the

Calistoga MA Redlines

City of St. Helena
Alternative Mitigation Actions Considered

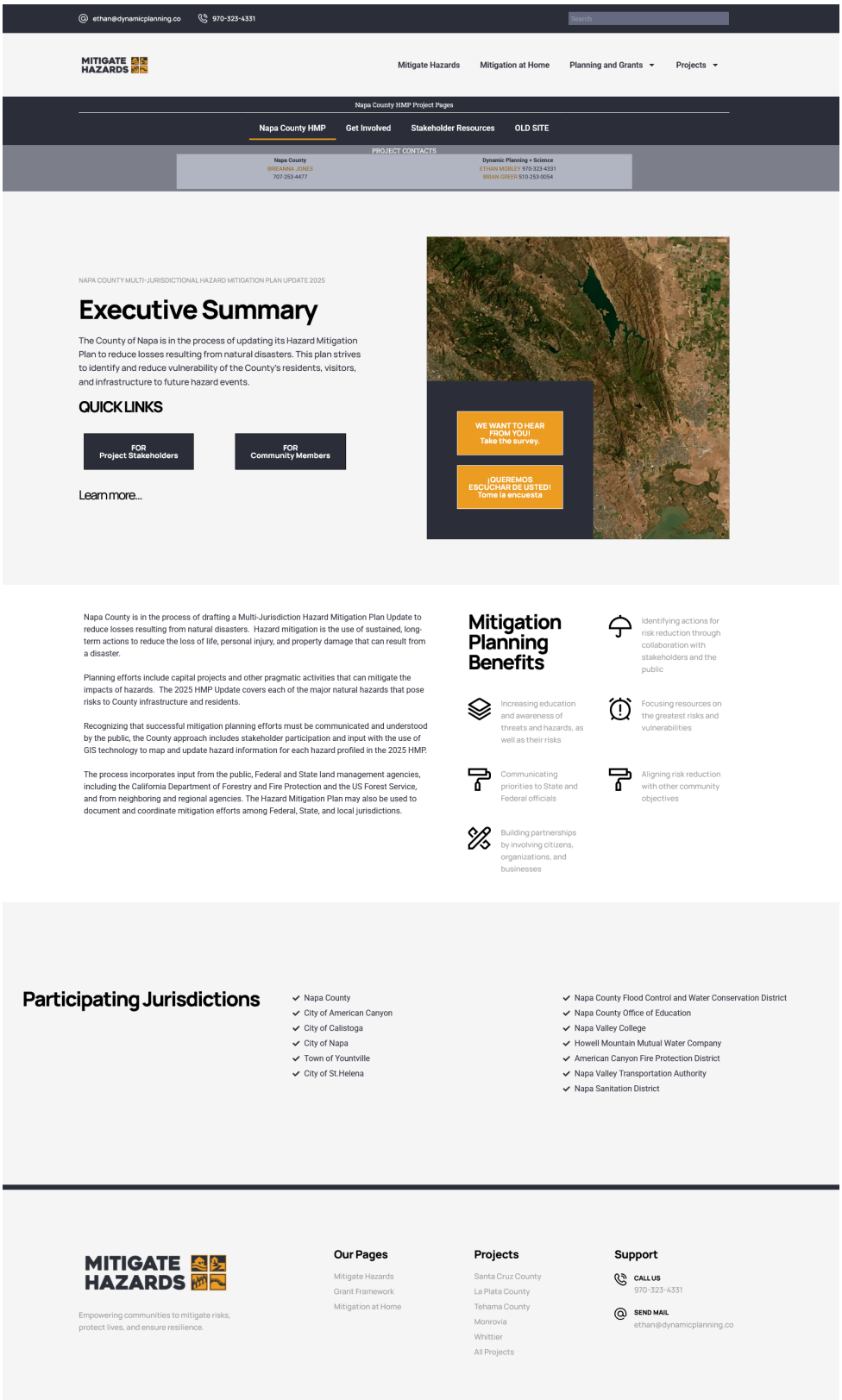
Hazard	Action ID (Existing ID or "New")	Action Title	Description	SMARTIE Implementation Details	Selected FEMA Mitigation Alternative(s)	Priority	VALIDATION FIELD (Retain, Revise, Delete)
All Hazard	**SH-06-2020 Revised**	Emergency Preparedness Awareness Campaign	Update, improve, and maintain multi-hazard emergency preparedness information on the City website, social media accounts, and newsletters, including outreach on evacuation route and shelter information targeted to tourists through lodging operators.	**S:** Update disaster preparedness webpages + distribute materials to lodging operators. **M:** Annual updates; track lodging facility participating. **A:** City manager's Office, Police and Fire + County OES, Chamber of Commerce, and Visit Napa Valley. **R:** Improves emergency readiness for residents and visitors. **T:** Website updates and first distribution by 2028, ongoing annually thereafter. **I/E:** Accessible and multi-lingual formats.	PE&A	High	
All Hazard	**SH-07-2020 Revised**	Critical Facility Power Resilience Projects	Assess, plan for, and implement microgrids and backup power systems at key facilities (EOC, fire station, police, water/wastewater, designated shelters) to maintain operations during and after hazard events.	**S:** Identify priority facilities + implement 2 microgrid/backup power projects. **M:** Assessment and project completion. **A:** City Public Works. **R:** Reduces outages and service disruptions. **T:** Assessment by 2028, projects by 2030. **I/E:** Engage vulnerable residents to inform microgrid siting and prioritize facilities serving low-income, senior, and medically vulnerable populations.	SP, ES	High	
All Hazard	**SH-12-2020, SH-14-2020, SH-05-2020, SH-01-2020, SH-04-2020, SH-08-2020 & SH-10-2020 Revised**	All-Hazard Mitigation Education Program	Develop an outreach and education program that provides guidance on home, business, and public facility hazard mitigation, financial resources, and available technical assistance. Host annual workshops supported by free or low-cost resource kits, including on hazard insurance, earthquake risk and retrofits, wildfire structural hardening and defensible space, human-caused ignition, air quality mitigation measures, flood protection, drainage improvements, and slope failure prevention. This includes workshops targeted for homeowners, renters, mobile home occupants, small businesses, adult and child care providers, and schools and other assembly facilities.	**S:** Develop program, workshops, and materials + implement annually. **M:** Workshop participation rate. **A:** City Manager's Office, Planning, Fire, and Police + County OES and RCD. **R:** Improves education, awareness, and overall community resilience. **T:** Develop by 2028, launch by 2029; ongoing annually thereafter. **I/E:** Accessible and multi-lingual workshop formats and materials, and offer financial assistance for low-income households.	PE&A	High	
Drought	**SH-15-2020 Revised**	Water-Efficient Landscaping Assistance Program	Develop model planting plans, design guidance, and incentives to help residents and businesses shift to water-smart landscaping consistent with water-conservation policies.	**S:** Develop St. Helena-specific water-wise landscape guidance handouts + offer technical assistance and incentives. **M:** Guidance documents and participation rate. **A:** City Planning and Public Works + RCD and local plant nurseries. **R:** Reduces water use and supports drought resilience. **T:** Guide published by 2029, assistance and incentive program established by 2030. **I:** Target outreach to renters, HOAs, and small businesses. **E:** Provide higher incentive levels for low-income households.	NRP, PE&A	Medium	The City zoning ordinance has a WELO (Water efficiency landscape ordinance) that applies to new development so I don't know if the SMARTIE column needs to call out needing a landscape guide.

St Helena Redlines

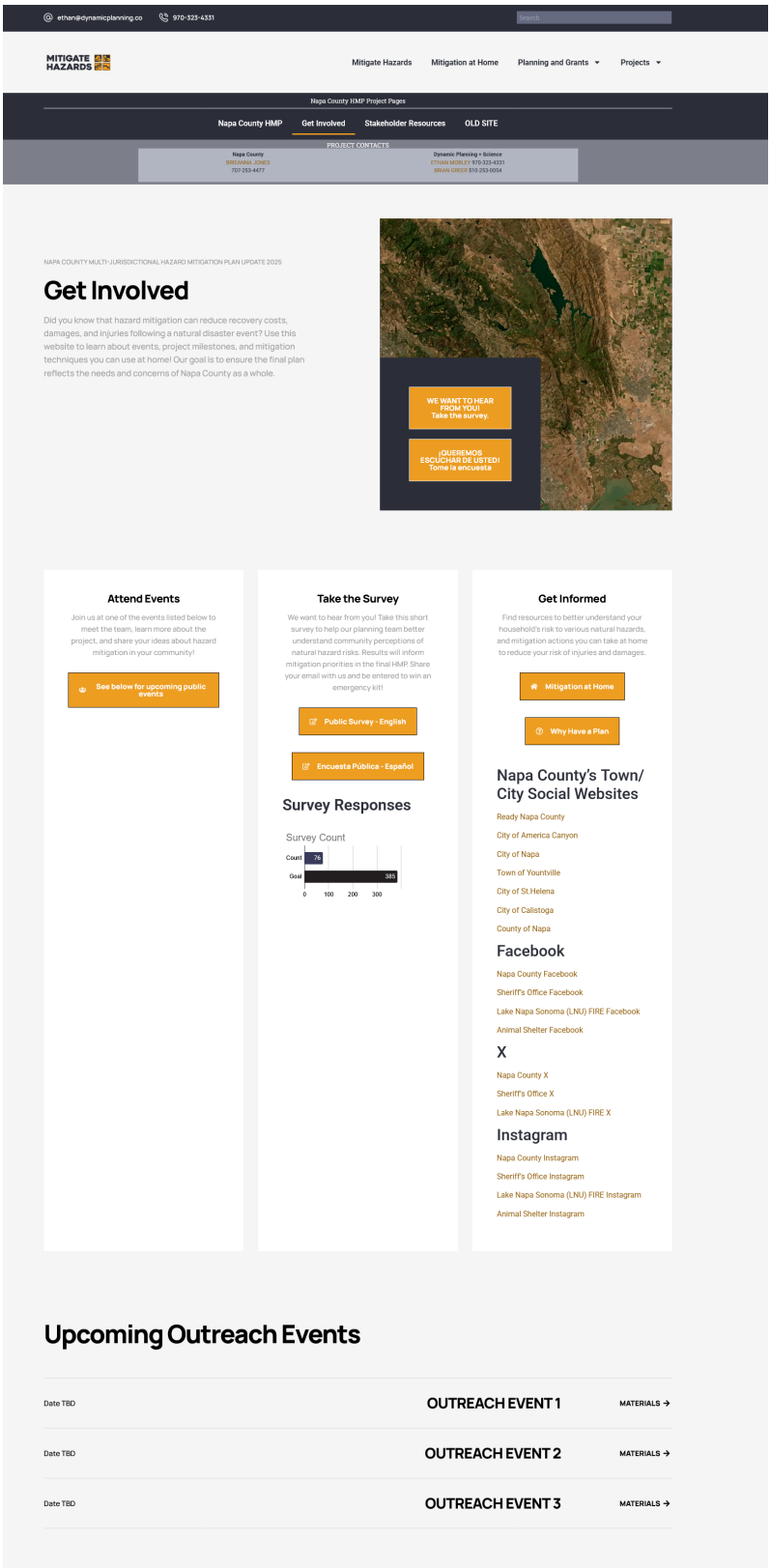
Website Documentation

Appendix B.5

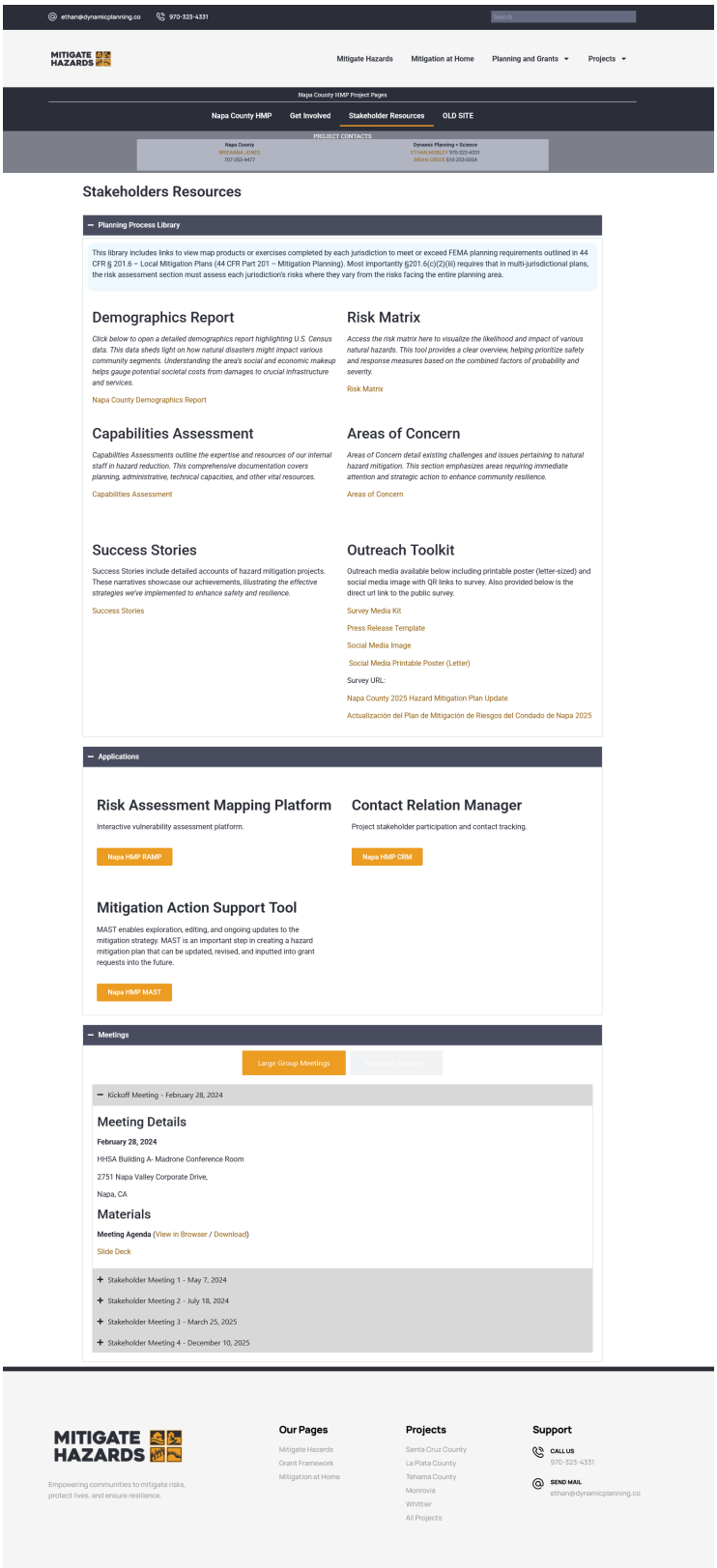
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Mitigate Hazards - Executive Summary



Mitigate Hazards - Get Involved



Mitigate Hazards - Stakeholder Resources (2)

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Outreach Events

Appendix B.6

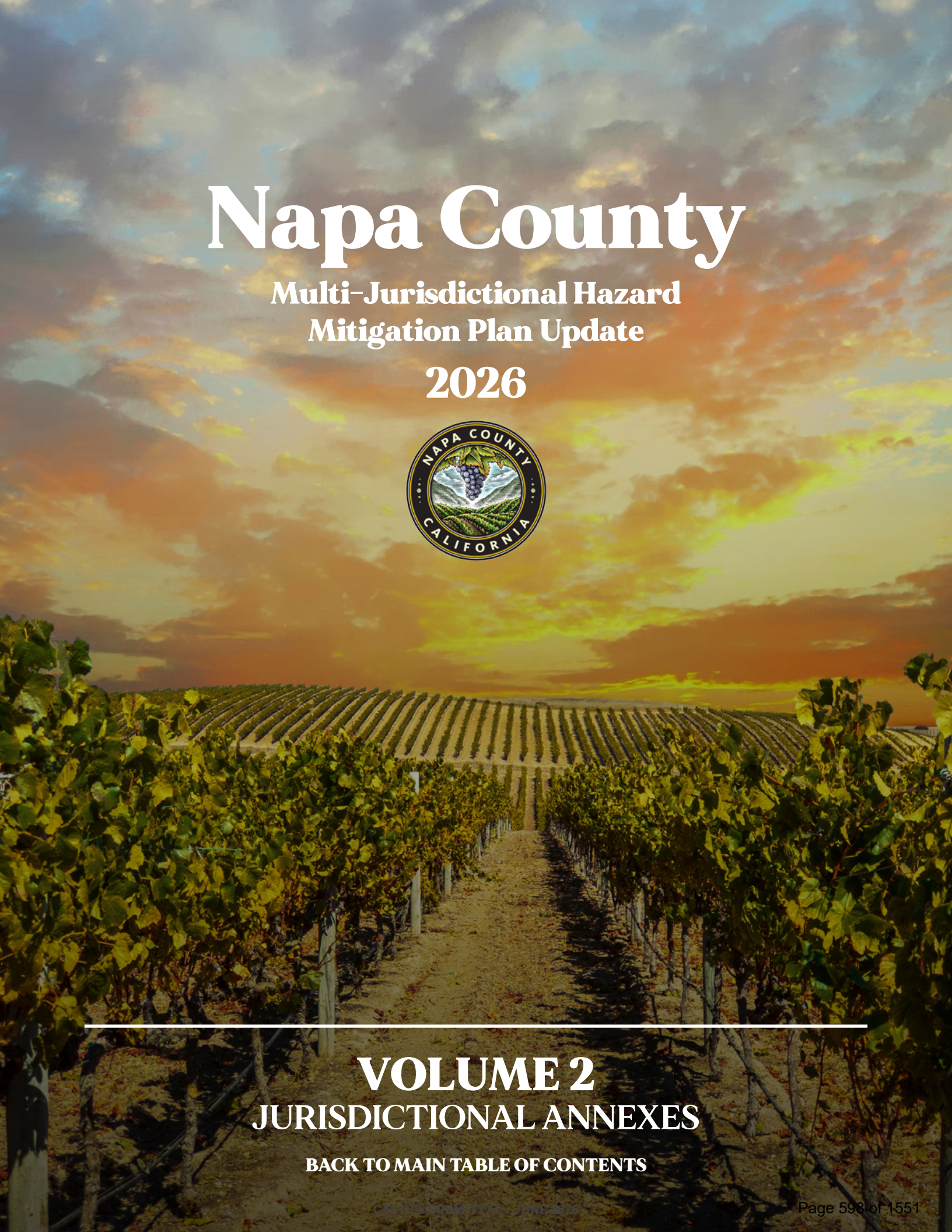
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a Farmers Market 1



a Farmers Market 2



Napa County

Multi-Jurisdictional Hazard Mitigation Plan Update

2026

VOLUME 2
JURISDICTIONAL ANNEXES

BACK TO MAIN TABLE OF CONTENTS

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Napa County

Multi-Jurisdictional Hazard Mitigation Plan Update

2026

Volume 2: Jurisdiction-Specific Annexes

Introduction ..... **iv**
Section 1. City of American Canyon **1-1**
Section 2. City of Calistoga **2-1**
Section 3. City of Napa **3-1**
Section 4. City of St. Helena **4-1**
Section 5. Town of Yountville **5-1**
Section 6. American Canyon Fire Protection District **6-1**
Section 7. Howell Mountain Mutual Water Company **7-1**
Section 8. Napa County Flood Control and Water Conservation District **8-1**
Section 9. Napa County Office of Education **9-1**
Section 10. Napa Valley College **10-1**
Section 11. Napa Valley Transportation Authority **11-1**
Section 12. Napa Sanitation District **12-1**

Introduction

Volume 2 presents the jurisdictional annexes for all participating jurisdictions in the Napa County Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) and documents the process used to develop them. In the context of hazard mitigation planning, a participating jurisdiction includes local governments such as cities, towns, special districts, and other public entities that engage in the planning process and contribute to the development and implementation of mitigation strategies to reduce risk from natural hazards.

To meet FEMA requirements for multi-jurisdictional plans, each participating jurisdiction must demonstrate active involvement in the planning process and formal adoption of the plan. Volume 2 provides documentation of this participation and compliance.

Volume 1 serves as the umbrella plan and provides detailed methodology, including stakeholder and public outreach, data collection, and plan development. Volume 2 builds on this foundation by providing jurisdiction-specific annexes that include hazard identification, vulnerability assessments, and mitigation strategies tailored to each participating jurisdiction. Participating jurisdictions also contributed data, technical input, and review of Volume 1.

Each annex in Volume 2 is provided as a standalone, hyperlinked document to facilitate ease of access and use by individual jurisdictions. Volume 2 is intended to support participating jurisdictions in accessing and implementing their annex-specific mitigation strategies.

Following approval by Cal OES and FEMA, participating jurisdictions are eligible to apply for funding through FEMA's Hazard Mitigation Assistance (HMA) programs, including the Hazard Mitigation Grant Program (HMGP), Flood Mitigation Assistance (FMA), and Building Resilient Infrastructure and Communities (BRIC). Additional information on these programs is provided in Volume 1, Section 4.2.3.

All FEMA approvals and jurisdictional adoption resolutions are available through the project website:
Napa County MJHMP 2025 Update – Mitigate Hazards

Planning Process Library

All participating jurisdictions crafted their own annex, complete with a hazard identification and risk assessment, vulnerability assessment, problem statements, mitigation strategy, and capabilities assessment, by following the Planning Process outlined in Volume 1, Section 2.1.3 (Table 1). This section provides links to these specific tasks that lead to the development of the annex, as well as the fully produced annex document. Each subsection includes a crosswalk of tasks completed by each participating jurisdiction and the status of progress made towards submission and approval of the annexes by Cal OES and FEMA.

Table 1: Planning Process Library

Exercise No. / Title		Library Links
1	**Risk Assessment**	Hazard and Demographic Maps
2	**Hazard Prioritization**	Risk Matrices
3	**Areas of Concern**	Problem Statements
4	**Capabilities and Opportunities Assessment**	Assessments
5	**Strategy Development**	Alternatives Considered (see Action Plans for final Strategies)

Municipal Jurisdictions



Municipalities, to include both cities and towns, hold the most extensive authority, financial resources, and services among participating jurisdictions. In California, this power is derived from Article XI, § 7 of the state constitution, granting them the ability to enact local laws, manage public works, utilities, and oversee municipal property and finances. Municipalities can be charter or general law cities, with charter cities having greater autonomy over municipal affairs, as outlined in Article XI, § 5(a). Regardless of type, municipalities have significant authority, particularly in mitigating hazards. (League of California Cities)

Table 2 includes a listing of each jurisdiction-specific breakout meeting including meeting dates and topics.

Table 2: Municipality Meetings Summary

Breakout Meeting #1 (BO #1) Summary of Topics	Breakout Meeting #2 (BO #2) Summary of Topics
Purpose: To introduce jurisdiction-specific hazard mitigation planning efforts, present risk assessment findings, and support initial prioritization of hazard risks using countywide data and planning tools. Breakout Meeting #1 focused on introducing key planning inputs, reviewing countywide coordination efforts, and presenting jurisdiction-specific risk assessment findings and tools. Topics included: • Recaps of Countywide HMPT Meetings #1 and #2 (or #1 through #3, as applicable) • Community engagement progress and results • Risk assessment findings and community vulnerability • Demographics and identification of vulnerable populations • Overview of jurisdiction-specific hazard risks and exposure • Introduction to the Risk Assessment Mapping Platform (RAMP) • Jurisdiction-specific hazard risk ranking exercise • Project schedule updates and next steps	**Purpose:** To refine mitigation strategies and develop jurisdiction-specific actions by building on identified risks, capabilities, and community input. Breakout Meeting #2 focused on refining mitigation strategies and aligning jurisdiction-specific actions based on identified risks and capabilities. Topics included: • Recap of Breakout Meeting #1 and HMPT Meeting #3 • Review of the capabilities assessment • Identification of areas of concern and development of problem statements • Principles of effective mitigation strategies and evaluation of alternatives • Refinement and alignment of jurisdiction-specific mitigation actions • Project schedule updates and next steps
BO #1 Meeting Dates by Jurisdiction: • City of American Canyon – October 1, 2024 • City of Calistoga – August 22, 2024 • City of Napa – September 25, 2025 • City of St. Helena – September 26, 2024 • Town of Yountville – November 6, 2025	**BO #2 Meeting Dates by Jurisdiction:** • City of American Canyon – January 29, 2026 • City of Calistoga – November 10, 2025 • City of Napa – June 12, 2025 • City of St. Helena – June 18, 2025 • Town of Yountville – November 19, 2025

Special Districts



Special districts participating in the Napa County Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) play a critical role in delivering essential services and maintaining infrastructure vital to community resilience. As limited-purpose entities established under California law, they provide services such as fire protection, water, wastewater, flood control, education, and transportation. While their authority is more narrowly defined than that of cities or counties, special districts oversee key facilities and systems that are often directly exposed to hazards and are essential for response and recovery.

Table 3 includes a listing of each jurisdiction-specific breakout meeting including meeting dates and topics.

Table 3: Special District Meetings Summary

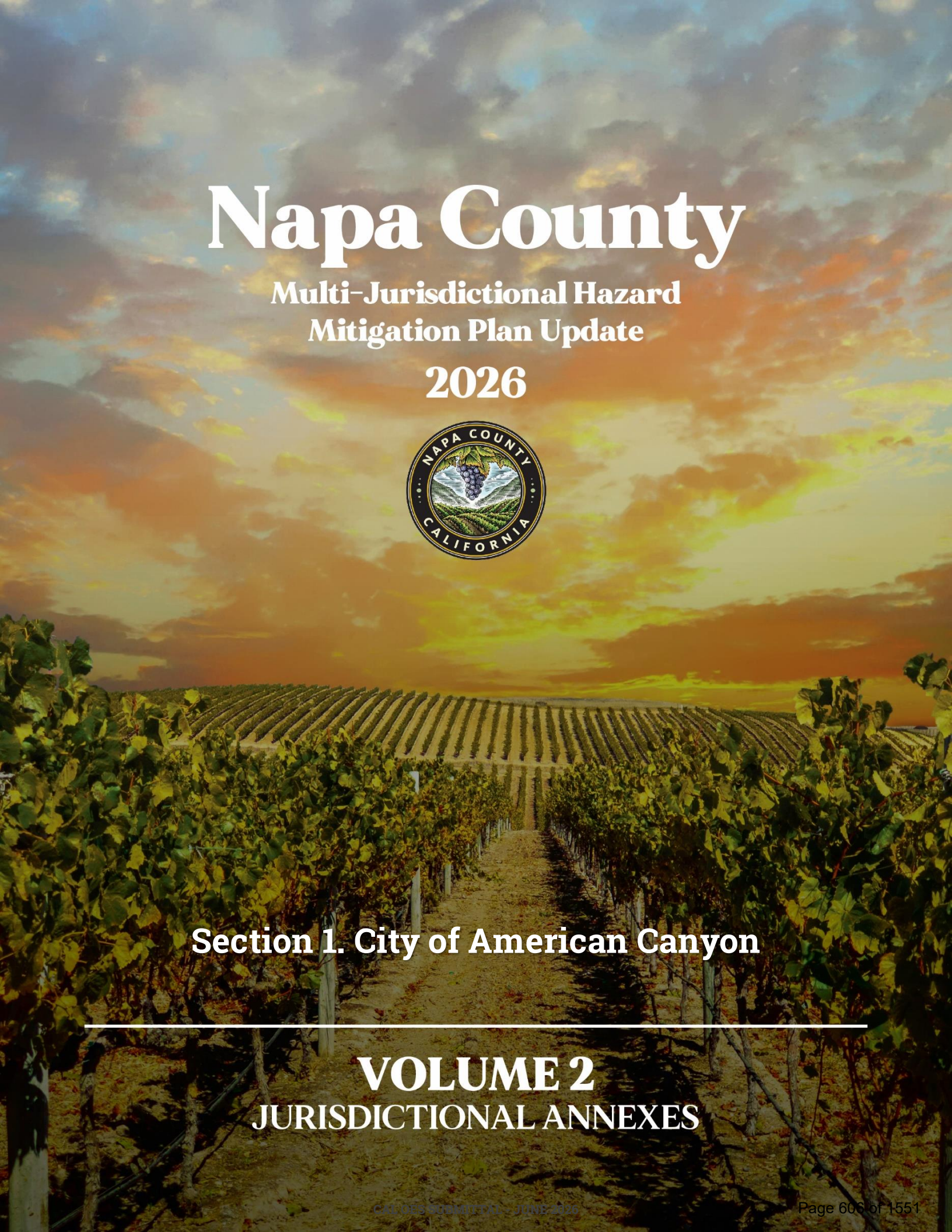
Breakout Meeting #1 (BO #1) Summary of Topics	Breakout Meeting #2 (BO #2) Summary of Topics
Purpose: To introduce special district participation in the hazard mitigation planning process, present risk assessment findings, and support initial prioritization of hazard risks based on district operations, assets, and service responsibilities. Breakout Meeting #1 focused on introducing key planning inputs, reviewing countywide coordination efforts, and presenting district-specific risk assessment findings and tools. Topics included: • Recaps of Countywide HMPT Meetings #1 and #2 • Community engagement progress and results • Risk assessment findings and community vulnerability • Demographics and identification of vulnerable populations • Overview of district-specific hazard risks and exposure • Introduction to the Risk Assessment Mapping Platform (RAMP) • Jurisdiction-specific hazard risk ranking exercise • Project schedule updates and next steps	**Purpose:** To refine mitigation strategies and develop district-specific actions by building on identified risks, capabilities, and operational priorities. Breakout Meeting #2 focused on refining mitigation strategies and aligning district-specific actions based on identified risks, infrastructure vulnerabilities, and service delivery considerations. Topics included: • Recap of Breakout Meeting #1 and HMPT Meeting #3 • Review of the capabilities assessment • Identification of areas of concern and development of problem statements • Principles of effective mitigation strategies and evaluation of alternatives • Refinement and alignment of jurisdiction-specific mitigation actions • Project schedule updates and next steps

Breakout Meeting #1 (BO #1) Summary of Topics	Breakout Meeting #2 (BO #2) Summary of Topics
BO #1 Meeting Dates by Special District: • American Canyon Fire Protection District – August 14, 2024 • Howell Mountain Mutual Water Company – September 10, 2024 • Napa County Flood Control and Water Conservation District – October 23, 2024 • Napa County Office of Education – August 28, 2024 • Napa Valley College – August 28, 2024 • Napa Valley Transportation Authority – September 5, 2024 • NapaSan – August 21, 2024	**BO #2 Meeting Dates by Special District:** • American Canyon Fire Protection District – June 22, 2025 • Howell Mountain Mutual Water Company – June 3, 2025 • Napa County Flood Control and Water Conservation District – November 4, 2025 • Napa County Office of Education – August 19, 2025 • Napa Valley College – August 19, 2025 • Napa Valley Transportation Authority – May 7, 2025 • NapaSan – June 9, 2025

Napa County

Multi-Jurisdictional Hazard Mitigation Plan Update

2026



Section 1. City of American Canyon

VOLUME 2
JURISDICTIONAL ANNEXES

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SECTION 1

JURISDICTIONAL ANNEX

City of American Canyon

NAPA COUNTY

Multi-Jurisdictional Hazard Mitigation Plan

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Napa County

2026 Multi-Jurisdictional Hazard Mitigation Plan Update

City of American Canyon (AC)

Municipal Annex

Section 1. City of American Canyon 1-9

1.1 Scope & Purpose 1-9

1.2 Jurisdictional Setting 1-9

1.2.1 Geography & Climate 1-10

1.2.2 Demographics & Vulnerable Populations 1-12

1.2.3 Economy 1-28

1.2.4 Growth Trends & Future Development 1-28

1.3 Planning Process 1-29

1.3.1 Public Input & Draft Review 1-31

1.4 What's New 1-32

1.4.1 Mitigation Activities 1-32

1.4.2 Mitigation Successes 1-33

1.5 Risk Assessment 1-36

1.5.1 Hazard Screening & Prioritization 1-36

1.5.2 Vulnerability to Specific Hazards 1-40

1.5.3 Climate Change Impacts & Vulnerable Populations 1-65

1.5.4 Hazard Problem Statements 1-66

1.6 Mitigation Strategy 1-70

1.6.1 Capabilities & Opportunities 1-71

1.6.2 City of American Canyon Mitigation Action Plan 1-85

1.6.3 Status of Previous Mitigation Actions 1-89

List of Figures

Figure 1-1: City of American Canyon Geographic Overview Map 1-11
Figure 1-2: City of American Canyon Median Household Income Map 1-15
Figure 1-3: City of American Canyon Poverty Status Map 1-16
Figure 1-4: City of American Canyon Housing Occupancy Map 1-17
Figure 1-5: City of American Canyon Dependent Age Groups Map 1-21
Figure 1-6: City of American Canyon Disabled Elderly Map 1-22
Figure 1-7: City of American Canyon Race and Ethnicity Map 1-24
Figure 1-8: City of American Canyon Spanish-Speaking Households Map 1-25
Figure 1-9: City of American Canyon CDC Social Vulnerability Index Map 1-27
Figure 1-10: American Canyon Grazing 1-34
Figure 1-11: Wetlands Edge Project 1-35
Figure 1-12: City of American Canyon Risk Assessment Matrix 1-38
Figure 1-13: Exposure Summary – City of American Canyon Wildfire Risk 1-42
Figure 1-14: City of American Canyon Flood Risk (FEMA Zones and DWR Awareness Zone) 1-46
Figure 1-15: Exposure Summary – City of American Canyon Flood Risk (FEMA Zones) 1-47
Figure 1-15: Exposure Summary – City of American Canyon Dam Inundation Zone 1-50
Figure 1-16: Exposure Summary – City of American Canyon Earthquake Risk (M7.1 Hunting Creek–Berryessa) 1-53
Figure 1-17: Exposure Summary – City of American Canyon Earthquake Risk (M6.7 West Napa) 1-54
Figure 1-18: City of American Canyon Liquefaction Risk 1-55
Figure 1-19: Exposure Summary – City of American Canyon Slope Failure Risk 1-57
Figure 1-20: Drought Severity Timeline 2000-2026 1-60
Figure 1-21: Mitigation Action Number Key 1-85

List of Tables

Table 1-1: City of American Canyon Population and Households 1-12
Table 1-2: City of American Canyon Income and Poverty 1-13
Table 1-3: City of American Canyon Renter- and Owner-Occupied Housing 1-14
Table 1-4: City of American Canyon Households with Seniors 1-18
Table 1-5: City of American Canyon Households with Children 1-19
Table 1-6: City of American Canyon Population with Disabilities and Access to Transportation 1-20
Table 1-7: City of American Canyon Household Languages 1-23
Table 1-8: City of American Canyon Planning Team and Steering Group Members 1-30
Table 1-9: City of American Canyon Planning Team Meetings 1-31
Table 1-10: City of American Canyon Document Review of Potential Hazards 1-37
Table 1-11: City of American Canyon Hazards Prioritization Summary 1-39
Table 1-12: City of American Canyon National Flood Insurance Program Information 1-44

Table 1-13: Drought Classifications and Impacts 1-59
Table 1-14: Cal-Adapt Extreme Heat Thresholds 1-62
Table 1-15: City of American Canyon Hazard Problem Statements 1-67
Table 1-16: City of American Canyon Capabilities and Opportunities Assessment 1-79
Table 1-17: City of American Canyon Mitigation Action Plan 1-87
Table 1-18: City of American Canyon Status of Previous Mitigation Actions 1-89

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Adoption Resolution

To comply with the Federal Disaster Mitigation Act of 2000 (DMA 2000), the City of American Canyon City Council has officially adopted this 2026 Napa County Multi-Jurisdictional Hazard Mitigation Plan, including Volume 1 in its entirety as well as this Volume 2 municipal annex. The adoption of the MJHMP recognizes the city's commitment to reducing the impacts of natural hazards within its jurisdiction and across Napa County.

A copy of the city's adoption record is provided on the following pages. Adoption records for all jurisdictions are summarized in Volume 1, Table ES-1.

ADOPTION RECORD TO BE INSERTED UPON COMPLETION.

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Section 1. City of American Canyon

1.1 Scope & Purpose

This Jurisdictional Annex for the City of American Canyon of the 2026 Napa County Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) details the hazard mitigation planning elements specific to the city's planning area. The annex is not intended to be a standalone document but appends to and supplements the information contained in the umbrella plan document (Volume 1). As such, all sections of the umbrella plan, including the planning process and other procedural requirements, apply to and were met by the City of American Canyon. This annex provides additional information specific to the city, with a focus on hazard identification and risk assessment, vulnerability assessment, problem statements, mitigation strategy, and capabilities assessment. Below are the City of American Canyon Points of Contact:

Primary Point of Contact	Alternate Point of Contact
Dominic Patrick, Water Systems Manager City of American Canyon 4381 Broadway Street, Suite 201, American Canyon, CA 94503 Telephone: (707) 258-1269 email: dpatrick@cityofamericancanyon.org	Alexandra Ikeda, Deputy City Manager City of American Canyon 4381 Broadway Street, Suite 201, American Canyon, CA 94503 Telephone: (707) 647-4360 email: aikeda@americancanyon.gov

1.2 Jurisdictional Setting

The City of American Canyon is located in southern Napa County in Northern California, approximately 35 miles northeast of San Francisco and at the northern edge of the San Pablo Bay. The city is bounded by the Napa River and associated wetlands to the west, the City of Vallejo to the south, the Napa County Airport and unincorporated Napa County lands to the north, and the eastern foothills of the Sulphur Springs Mountain Range to the east. The city is situated along Highway 29, with easy access to regional transportation networks and functions as the southern gateway to Napa County and is characterized by a mix of residential neighborhoods, commercial centers, and regionally significant industrial and wine production facilities.

American Canyon encompasses approximately 6.5 square miles and includes low-lying areas near the Napa River as well as gradually rising terrain toward the eastern hills. This varied topography and proximity to tidal waterways influence the city's exposure to natural hazards, including flooding, seismic shaking, wildfire along the wildland–urban interface, and climate change–related impacts such as extreme heat and increased flood risk.

The city operates as a general law city under a council–manager form of government and provides a full range of municipal services, including police protection, public works, community development, and water,

wastewater, and recycled water services. Fire protection services are provided by the American Canyon Fire Protection District, an independent special district.

In addition to its incorporated boundaries, the city provides water and wastewater services to areas outside the city limits. Under California planning law, these extraterritorial service areas are considered part of the city's planning area because damage to infrastructure beyond municipal boundaries can directly affect public health, safety, and continuity of essential services within American Canyon. The City of American Canyon's location within Napa County and the State of California are shown in Figure 1-1.

- **Year of Incorporation:** January 1, 1992
- **2022 Population:** 21,669 (US Census Bureau, 2022)
- **Population Growth:** Long-term population growth since incorporation, with recent increases driven primarily by residential development within established urban areas and approved specific plans.

1.2.1 Geography & Climate

The City of American Canyon is located in the southern portion of Napa County and occupies a transitional geographic setting between the Napa River and San Pablo Bay to the west and the eastern foothills of the Sulphur Springs Mountain Range to the east. The City's western areas are characterized by low-lying floodplain and wetland environments associated with the Napa River and tidal influences from the Bay, while elevations gradually increase toward the east, transitioning into rolling hills and steeper terrain. Figure 1-1 provides a regional location map.

Hydrologically, American Canyon is part of the Napa River watershed, which conveys runoff from northern Napa County through the City before discharging into San Pablo Bay. Portions of the City lie near or within historic floodplain areas, particularly adjacent to the Napa River and associated sloughs and wetlands. These low-lying areas are subject to fluvial flooding, tidal backwater effects, and potential sea level rise impacts. Stormwater systems throughout the city are designed to manage runoff generated by seasonal precipitation.

American Canyon experiences a Mediterranean climate typical of Northern California, characterized by cool, wet winters and warm, dry summers. The majority of annual precipitation occurs between November and March, often in the form of moderate to heavy rain associated with atmospheric river events, averaging about 18 inches. Summers are generally dry, with extended periods of low humidity and elevated temperatures. This seasonal precipitation pattern contributes to both winter flood risk and summer drought and wildfire conditions.

Average daily temperatures are moderated by the city's proximity to San Pablo Bay, though inland heat can develop during summer months, particularly in eastern portions of the city farther from marine influence. Average summer temperatures range from the high 70s to mid-90s°F, while winter temperatures typically range from the mid-40s to low 60s°F. Climate change projections for the region indicate continued warming trends, increased variability in precipitation, more intense storm events, longer dry periods, and rising sea levels.

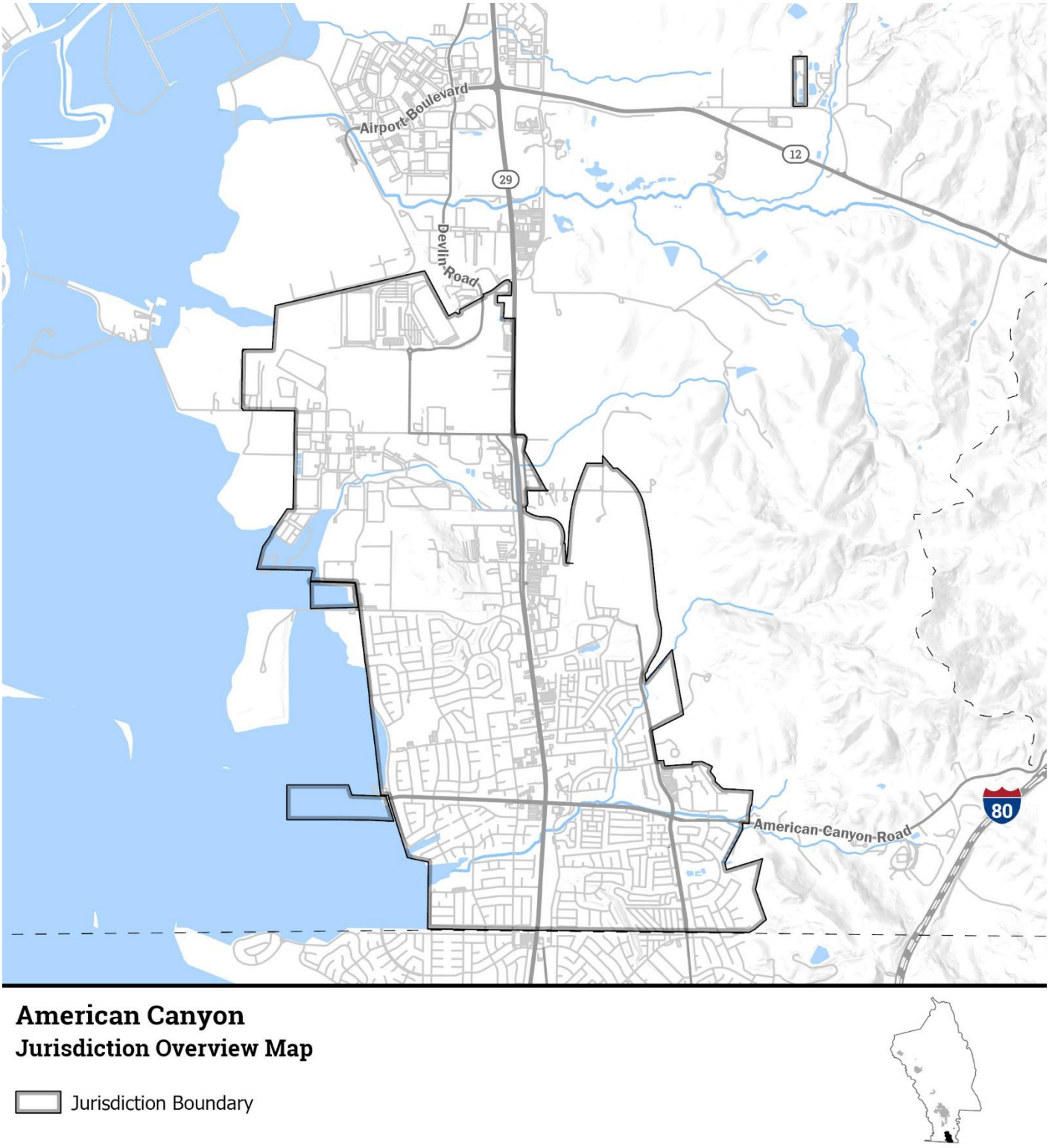


Figure 1-1: City of American Canyon Geographic Overview Map

1.2.2 Demographics & Vulnerable Populations

This section describes the demographic characteristics of the City of American Canyon to guide hazard mitigation planning efforts. Natural disasters affect communities both physically and socially, with demographic composition playing a central role in determining how impacts are distributed, particularly among vulnerable groups facing greater challenges in preparedness, response, and recovery. Understanding the area's social and economic landscape also helps assess potential social costs from infrastructure damage, including housing, industry, public facilities, essential services, and transportation.

Exploring local demographic data may help to identify groups and geographic areas with specific vulnerability to hazard events. In the context of all-hazards preparedness and response planning, at-risk individuals (often used interchangeably with "vulnerable populations") are defined federally as "children, pregnant women, senior citizens, and other individuals who have access or functional needs in the event of a public health emergency." (42 U.S.C. § 2802(b)(4)(B) (2019)) These populations may include, but are not limited to, individuals who are economically disadvantaged, living with disabilities, dependent on caregivers, from historically marginalized communities, have limited English proficiency or are non-English speaking, lack access to transportation, are experiencing homelessness, or have chronic medical conditions.

Certain populations face greater risk following a natural hazard event due to age, economic mobility, physical disability, geographic location, or a combination of factors. Vulnerability in the face of a hazard event is not a fixed characteristic; the same individual may be at risk for some hazards but not at risk for others. Planning for vulnerable populations in the context of hazard mitigation can help communities to prioritize limited resources where they will be the most effective. Refer to Volume 1, Section 1.4.3, for a more in-depth discussion of planning for vulnerable populations, at-risk individuals with access and functional needs, and environmental justice.

The total population, total number of households, and average household size of the City of American Canyon are presented in Table 1-1, compared to the other municipalities and Napa County.

Table 1-1: City of American Canyon Population and Households

Area	Total Population	Total Households (HH)	Average HH Size
Napa County	137,384	55,588	2.40
City of Napa	79,233	31,666	2.47
City of American Canyon	**21,669**	**5,924**	**3.64**
City of Calistoga	5,191	2,330	2.20
City of St. Helena	5,426	2,963	1.81
Town of Yountville	3,397	1,824	1.45

Source: ACS 5-Year, 2017-2022

1.2.2.1 Income & Housing

Economic mobility is one of the most important predictors of natural hazard vulnerability. Low-income residents are more likely to occupy housing which is inadequately maintained or otherwise poorly built to withstand extreme events. For example, mobile or modular homes are more susceptible to damage in earthquakes and floods than other types of residences and are less likely to contain A/C units to cope with high heat events. In urban areas, low-income residents are more likely to occupy older homes and apartment complexes with unreinforced masonry, which is particularly susceptible to seismic damage.

Low-income households and communities face disproportionate financial burden from costs associated with disaster preparedness, response, and recovery. Disasters create unexpected expenses which may serve as "tipping points" for families and individuals living on the edge of poverty or homelessness. Recovery costs may be higher for those without resources to conduct hazard mitigation activities ahead of time. Families and individuals who lack access to transportation may be unable to evacuate ahead of an emergency. (Krause & Reeves, 2017)

Low-income residents and renters are also less likely to purchase insurance, meaning that those with the most to lose during an event are also the least prepared to deal with potential losses. Major hurricane events in recent history such as Harvey, Irma, and Katrina all demonstrate that low-income and/or historically marginalized communities face increased vulnerability to hazard events and struggle the most to recover.

Median household income in the City of American Canyon was approximately $123,000, with an overall poverty rate of around 7%. By comparison, median income and poverty rates for Napa County were nearly $106,000 and 8%, respectively. (see Table 1-2) Median income and poverty rates are also shown on the block group level in Figure 1-2 and Figure 1-3.

Table 1-2: City of American Canyon Income and Poverty

Area	Median Income	Poverty Rate
Napa County	$105,809	7.9%
City of Napa	$100,273	8.1%
City of American Canyon	**$122,694**	**7.4%**
City of Calistoga	$96,667	5.4%
City of St. Helena	$135,781	5.7%
Town of Yountville	$75,134	10.6%

Source: ACS 5-Year, 2017-2022

Renters are also more vulnerable to natural hazards, as they are less likely to take out property insurance and the decision to make major structural improvements typically lies with the property owner. Federal disaster recovery services can exacerbate inequality between renters and homeowners; payout amounts are significantly higher for homeowners applying through FEMA's Individual Assistance (IA) program; from 1999 to 2013 U.S. homeowners saw their wealth increase with local hazard damages, whereas renters' wealth decreased. (Howell, Junia; Elliot, James, 2019)

Approximately 20% of occupied housing units in the City of American Canyon are renters, compared to approximately 35% for Napa County as a whole; refer to Table 1-3.

Table 1-3: City of American Canyon Renter- and Owner-Occupied Housing

Jurisdiction	# Occupied Housing Units	# Renter Occupied	% Renter Occupied	# Owner Occupied	% Owner Occupied
Napa County	49,738	17,676	35.5%	32,062	64.5%
City of Napa	26,978	10,616	39.4%	16,362	60.6%
City of American Canyon	**6,192**	**1,371**	**22.1%**	**4,821**	**77.9%**
City of Calistoga	2,042	822	40.3%	1,220	59.7%
City of St. Helena	2,380	1,048	44%	1,332	56.0%
Town of Yountville	1,050	362	34.5%	688	65.5%

Source: ACS 5-Year, 2017-2022

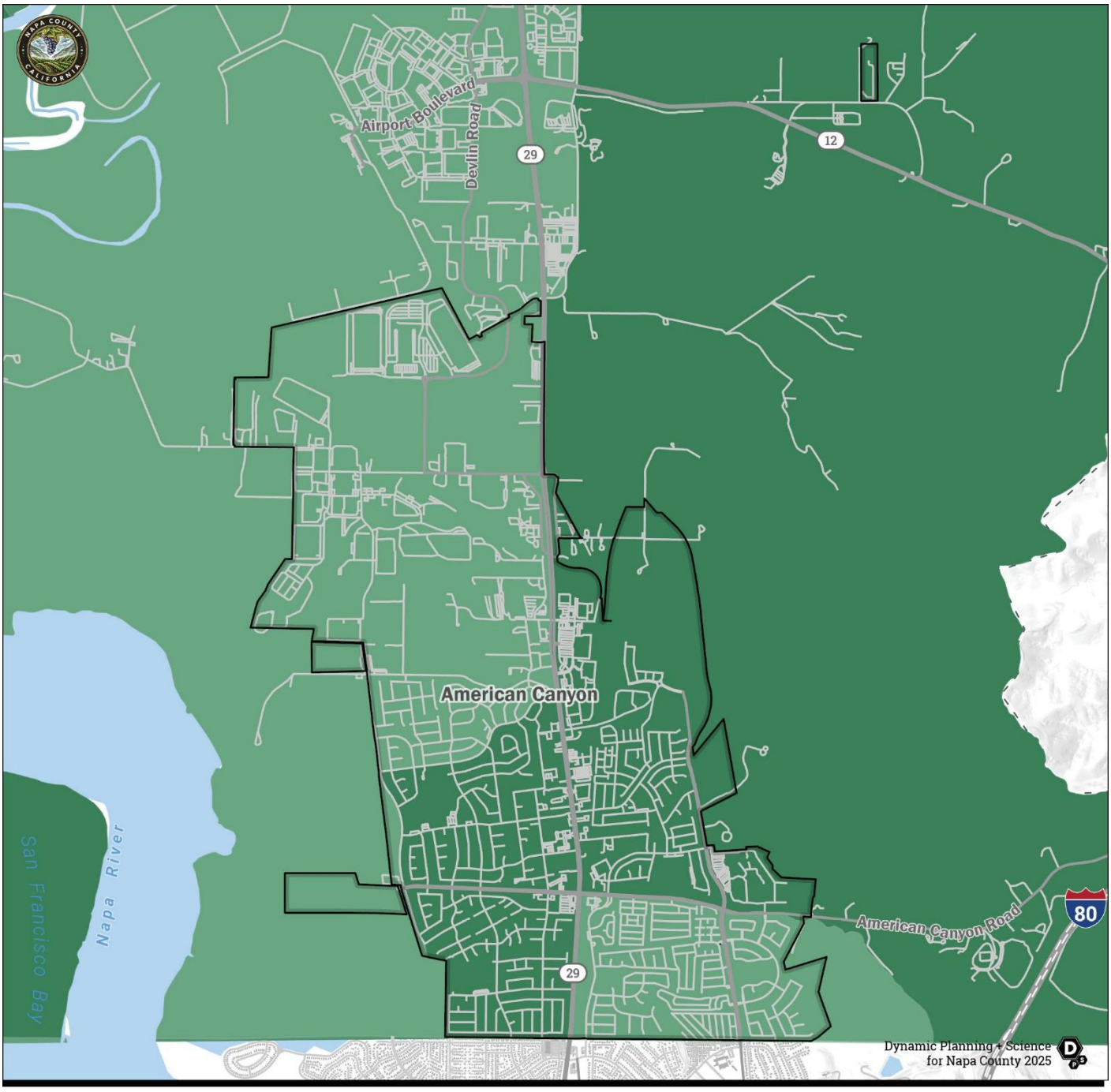


Figure 1-2: City of American Canyon Median Household Income Map

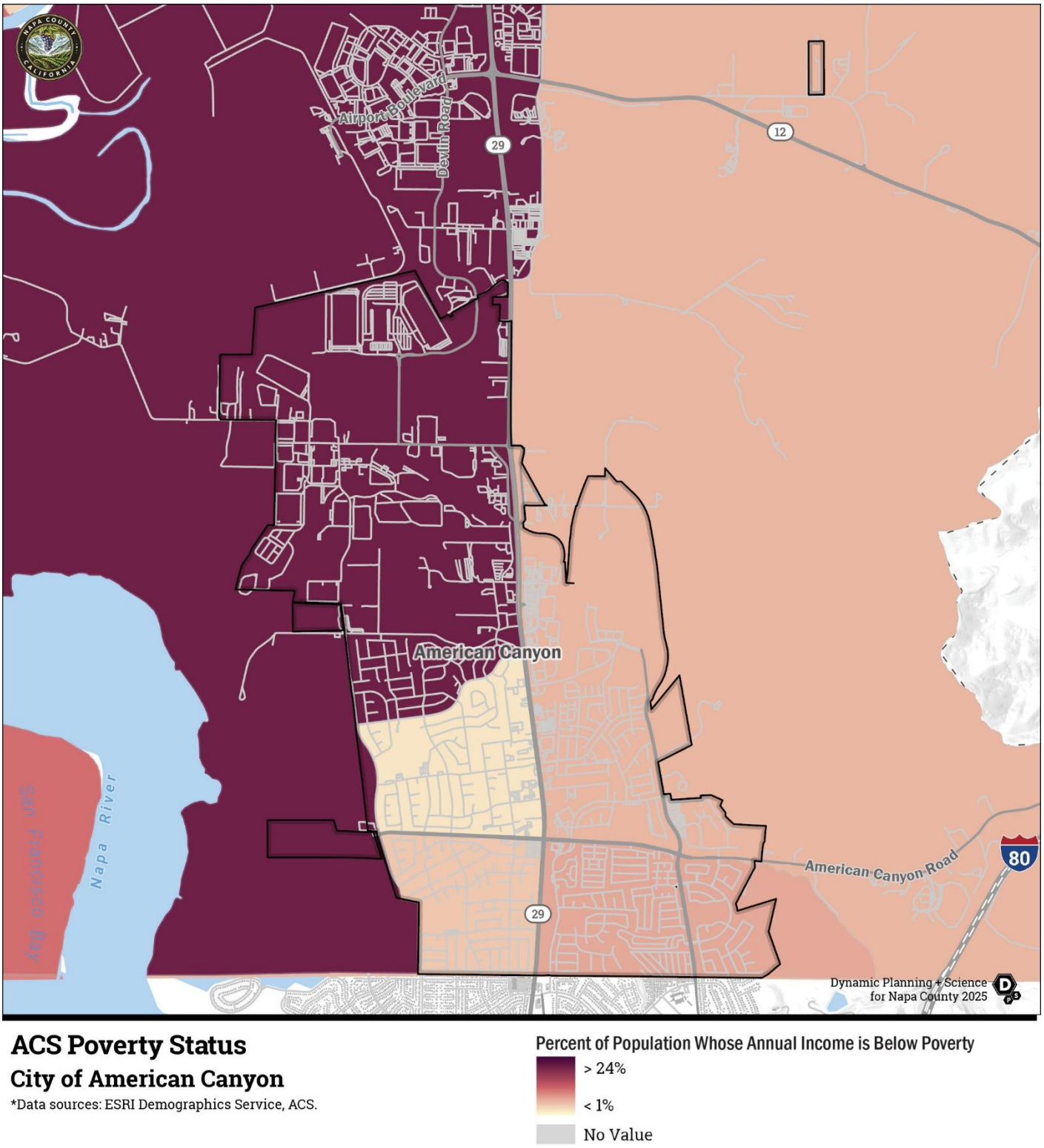


Figure 1-3: City of American Canyon Poverty Status Map

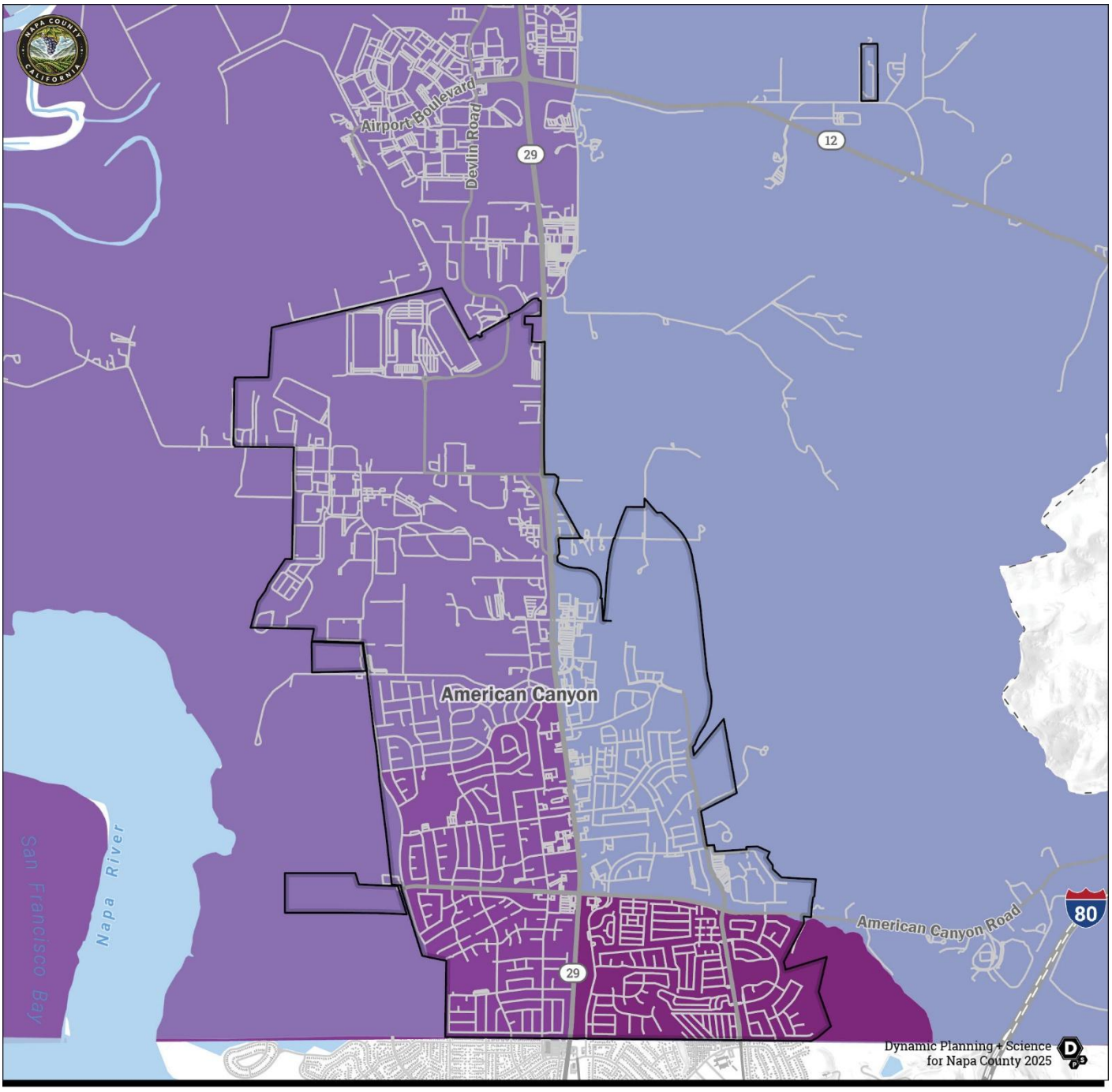


Figure 1-4: City of American Canyon Housing Occupancy Map

1.2.2.2 Dependent & Disabled Populations

Age is a significant factor in assessing vulnerability to natural hazards. Both older adults and children are considered dependent populations due to their reliance on caregivers for safety, mobility, and support during emergency events. These populations face heightened risks during disasters such as floods, wildfires, and earthquakes, particularly when compounding factors such as poverty, disability, or social isolation are present.

In the City of American Canyon, approximately 30% of households include at least one individual over the age of 65, and over 3% of all households consist of seniors living alone. While only around 2% of senior households live below the poverty line (Table 1-4), seniors, particularly those who are low-income or socially isolated, remain among the most vulnerable populations in disaster situations. Challenges for older adults may include limited mobility, chronic health conditions, reduced digital literacy, and lack of access to real-time emergency alerts. Seniors living alone may require additional assistance during evacuations or power outages, and assisted living facilities necessitate advanced coordination to ensure continuity of care and safety during emergencies.

Children represent another dependent population requiring special consideration (Table 1-5). In American Canyon, nearly 45% of households include individuals under the age of 18, with around 7% of these households headed by a single caregiver. During emergencies, children are entirely dependent on caregivers for decision-making, transportation, and access to essential resources. Disruptions to schools, childcare, and youth services can result in significant emotional, educational, and developmental impacts. Families with limited means or single caregivers may also face greater challenges in securing housing, supplies, and recovery assistance.

Figure 1-5 highlights areas within American Canyon with higher concentrations of economically dependent age groups, informing targeted outreach and response strategies during emergencies.

Table 1-4: City of American Canyon Households with Seniors

Jurisdiction	Households (HH)	65+	%	65+ Alone	%	65+ Poverty	%
Napa County	55,588	18,777	33.8%	4,816	8.7%	1,271	2.3%
City of American Canyon	**5,924**	**1,772**	**29.9%**	**184**	**3.1%**	**111**	**1.9%**
City of Calistoga	2,330	1,003	43.0%	419	18.0%	101	4.3%
City of Napa	31,666	10,299	32.5%	2,674	8.4%	703	2.2%
City of St. Helena	2,963	1,153	38.9%	296	10.0%	42	1.4%
Town of Yountville	1,824	873	47.9%	351	19.2%	77	4.2%

Source: ACS 5-Year, 2017-2022

Table 1-5: City of American Canyon Households with Children

Jurisdiction	Households	<18	%	<18 Single Caregiver	%
Napa County	55,588	14,596	26.3%	3,109	5.6%
City of American Canyon	**5,924**	**2,633**	**44.4%**	**417**	**7.0%**
City of Calistoga	2,330	471	20.2%	33	1.4%
City of Napa	31,666	8,934	28.2%	2,315	7.3%
City of St. Helena	2,963	619	20.9%	168	5.7%
Town of Yountville	1,824	160	8.8%	0	0.0%

Source: ACS 5-Year, 2017-2022

Elderly populations face increased risks during disaster events due to age-related health conditions, mobility limitations, and potential social isolation. In American Canyon, approximately 10% of the non-institutionalized population lives with a disability, a slightly higher rate than the countywide average of 12% (Table 1-6).

Among those with access and functional needs, elderly individuals with disabilities represent a highly vulnerable subpopulation when it comes to disaster preparedness, response, and recovery. This group includes seniors living with physical or cognitive impairments such as hearing or vision loss, reduced mobility, reliance on assistive medical devices, neurodivergence, or chronic health conditions that may be exacerbated by hazard events (e.g., exposure to wildfire smoke or extreme heat).

Figure 1-6 illustrates that in some portions of the city, more than 47% of the elderly population is estimated to have one or more disabilities, while other areas show lower proportions or lack available data. The spatial distribution shown on this map suggests that vulnerability is not uniform across the city and that certain neighborhoods may have greater needs for evacuation assistance, medical support, and continuity of care during emergencies. Seniors with disabilities may also be more sensitive to extended power outages, disruptions to medical services, and transportation interruptions. These risks are expected to increase under climate change conditions that intensify extreme heat events and strain emergency response resources.

The combination of advanced age and disability can present significant challenges not only during emergency response but also in implementing hazard mitigation measures. Elderly individuals with disabilities may face physical, financial, or logistical barriers to undertaking activities such as seismic retrofitting, anchoring fuel tanks, installing foundation bracing, or implementing residential flood-proofing techniques. Many live in older housing stock that is more vulnerable to earthquake damage or repetitive flooding and may lack the resources or support networks needed to complete mitigation upgrades.

Table 1-6: City of American Canyon Population with Disabilities and Access to Transportation

Jurisdiction	Population	Persons w/ Disability	%	Persons Reliant on Public Trans.	%	Households	HH w/o Vehicle	%
Napa County	137,384	16,544	12.0%	890	0.6%	55,588	2,421	4.4%
City of American Canyon	**21,669**	**2,201**	**10.2%**	**287**	**1.3%**	**5,924**	**138**	**2.3%**
City of Calistoga	5,191	573	11.0%	36	0.7%	2,330	83	3.6%
City of Napa	79,233	9,837	12.4%	291	0.4%	31,666	1,554	4.9%
City of St. Helena	5,426	683	12.6%	121	2.2%	2,963	219	7.4%
Town of Yountville	3,397	683	20.1%	15	0.4%	1,824	210	11.5%

Source: ACS 5-Year, 2017-2022

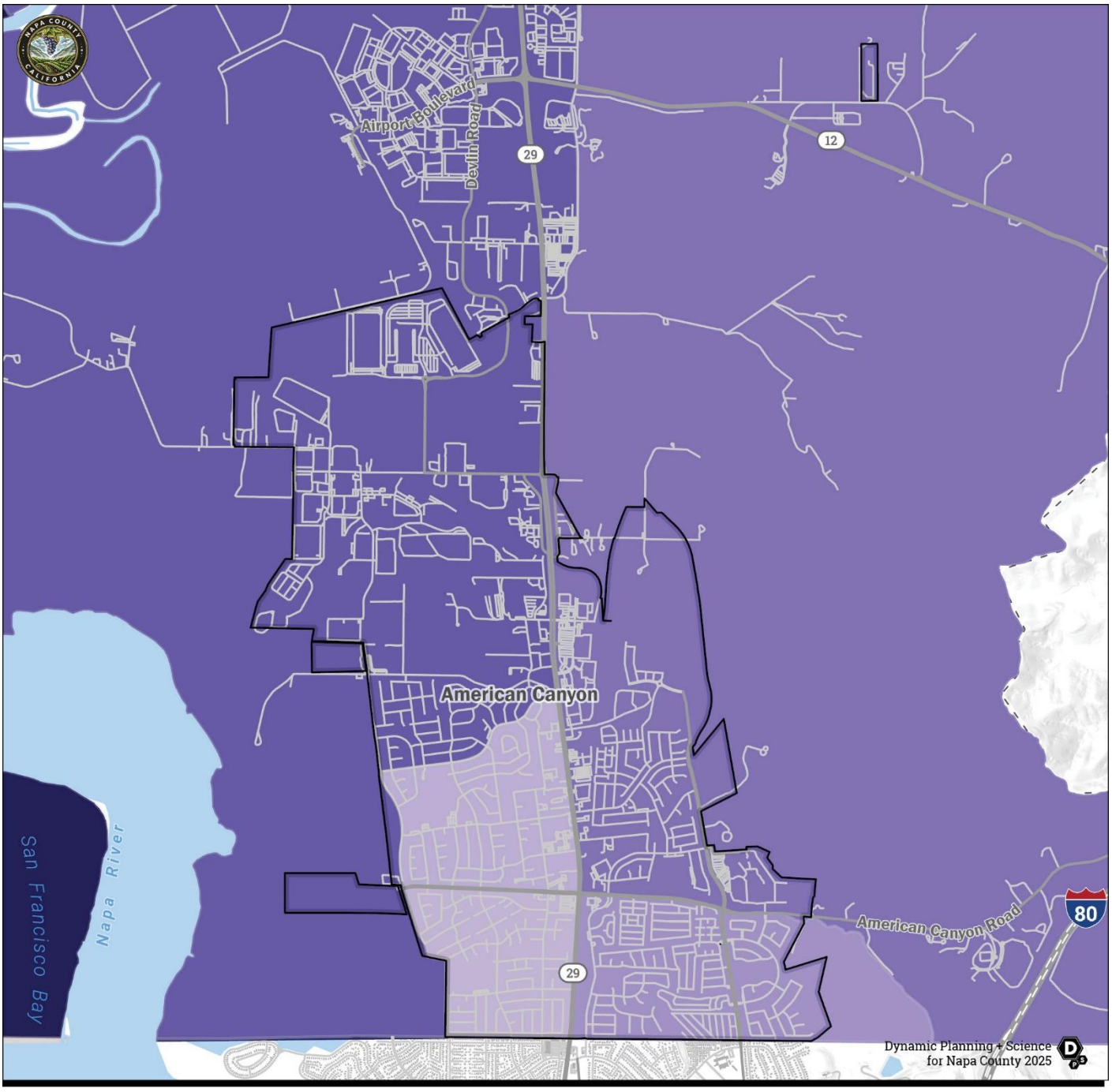


Figure 1-5: City of American Canyon Dependent Age Groups Map

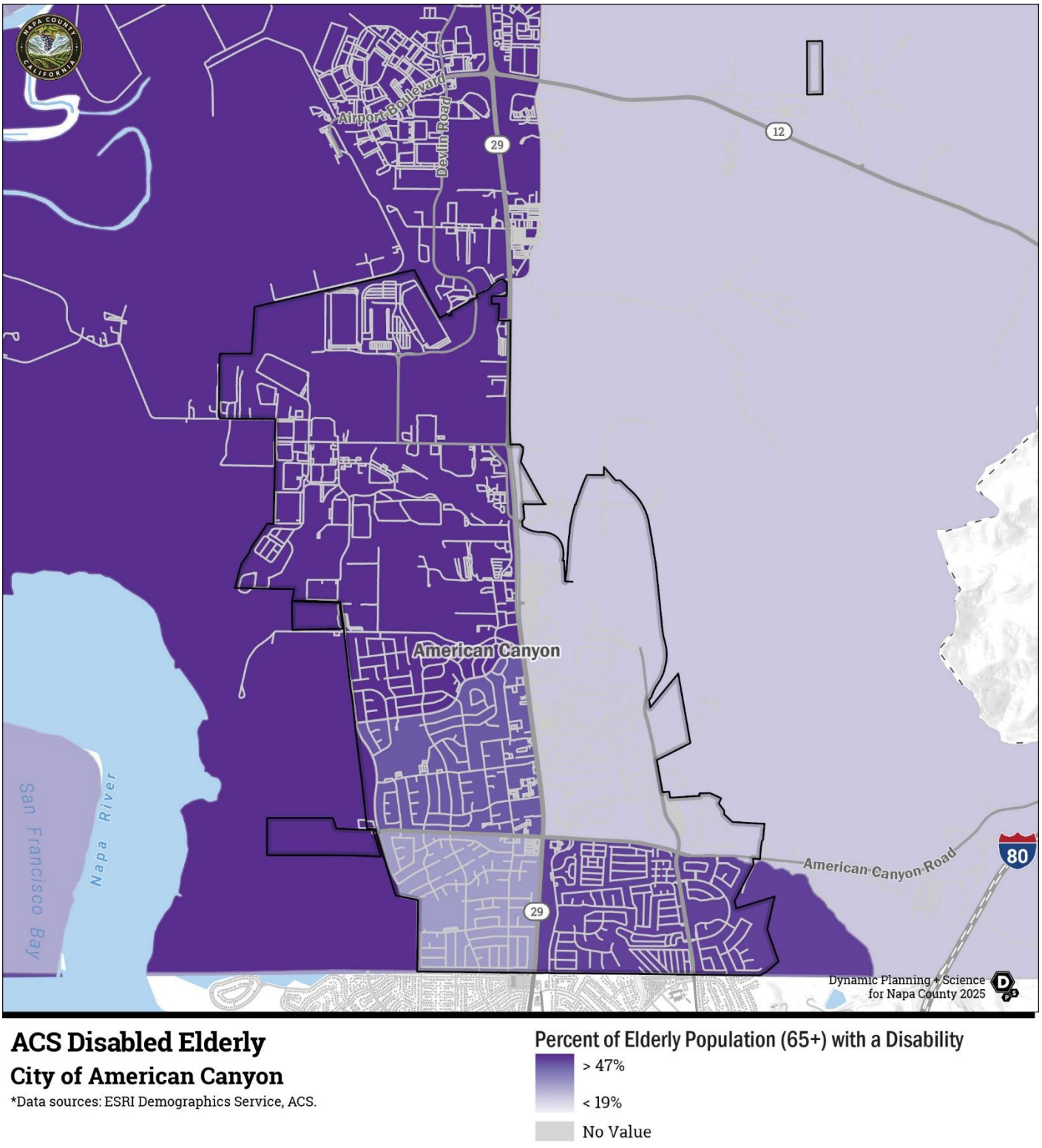


Figure 1-6: City of American Canyon Disabled Elderly Map

1.2.2.3 Race, Ethnicity & Language

Natural disasters compound racial disparities; non-white individuals and communities receive less recovery aid from FEMA than their white counterparts, even where the amount of damage is the same. (Howell, Junia; Elliott, James R., 2019) (National Advisory Council, 2020) These disparities are evidence of the complicated relationship between disaster recovery and overlapping social vulnerabilities including race, income, language, and health. Black and Latinx residents are more likely to be low income and renters, conditions which create barriers to navigating FEMA's Individual Assistance programs. Communities with more non-white residents may have lower tax revenue and property values, which means less investment in mitigation and rebuilding efforts before and after an emergency.

Figure 1-7 depicts the racial and ethnic composition of the City of American Canyon. According to ACS data, the city contains a mosaic of racial and ethnic communities rather than a single dominant population citywide. Several areas are predominantly Hispanic or Latino, particularly within central and southern residential neighborhoods, while other areas are characterized by predominance of White residents or Asian residents. Smaller concentrations of other racial and ethnic groups are present throughout the city, reflecting American Canyon's role as one of the most diverse communities in Napa County.

Residents with limited English proficiency (LEP) face heightened barriers to understanding emergency alerts, accessing preparedness resources, and navigating post-disaster recovery programs. In American Canyon, approximately 18% of households speak Spanish, but only around 2% report limited English proficiency. (Table 1-7). Figure 1-8 highlights where Spanish-speaking populations are concentrated in American Canyon.

Table 1-7: City of American Canyon Household Languages

Jurisdiction	Households (HH)	Spanish Speaking	%	Limited English	%	Other Lang.	%
Napa County	55,588	8,738	15.7%	2,141	3.9%	12	0.0%
City of American Canyon	**5,924**	**1,069**	**18.0%**	**177**	**3.0%**	**-**	**0.0%**
City of Calistoga	2,330	474	20.3%	63	2.7%	-	0.0%
City of Napa	31,666	5,800	18.3%	1,653	5.2%	9	0.0%
City of St. Helena	2,963	370	12.5%	88	3.0%	-	0.0%
Town of Yountville	1,824	49	2.7%	21	1.2%	-	0.0%

Source: ACS 5-Year, 2017-2022

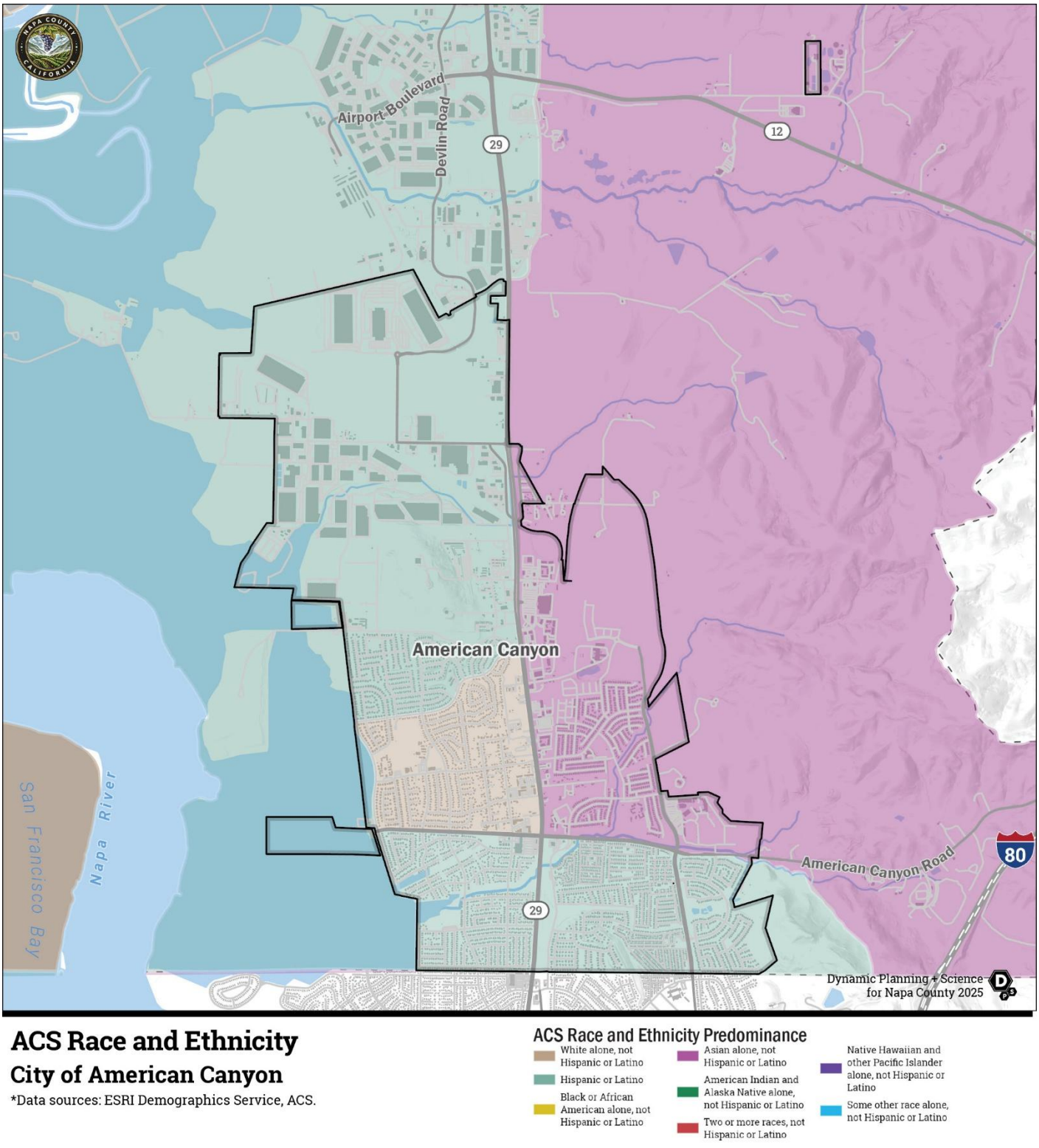


Figure 1-7: City of American Canyon Race and Ethnicity Map

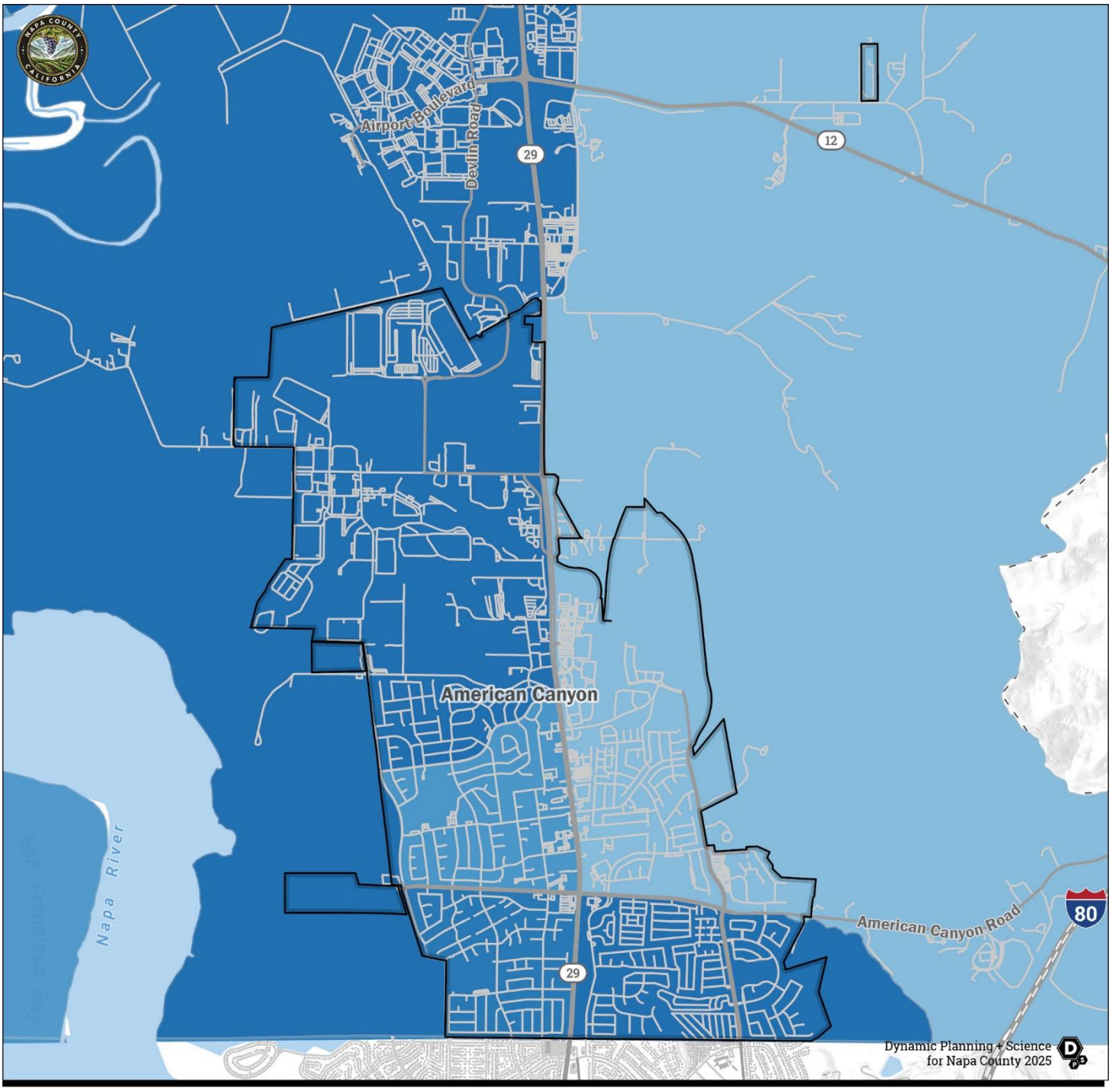


Figure 1-8: City of American Canyon Spanish-Speaking Households Map

1.2.2.4 Social Vulnerability Index (SVI)

The Centers for Disease Control and Prevention (CDC) Social Vulnerability Index (SVI) for City of American Canyon reveals important spatial and demographic patterns that have direct implications for equitable hazard mitigation planning. As discussed in detail in Volume 1, Section 1.4.3.6, the SVI is a composite measure developed by the CDC to identify communities that are more likely to require support before, during, and after a disaster. It incorporates a range of factors across four key dimensions: socioeconomic status, household composition and disability, minority status and language, and housing type and transportation access. The resulting index score ranges from 0 (lowest vulnerability) to 1 (highest vulnerability).

Figure 1-9 shows that social vulnerability varies across American Canyon, with several census block groups exhibiting moderate to high SVI scores. Areas with higher SVI values (shown in darker blue shades) indicate neighborhoods where residents may have reduced capacity to prepare for, respond to, and recover from hazard events due to factors such as lower income, higher proportions of renters, limited access to vehicles, language barriers, or greater concentrations of elderly and disabled individuals. Conversely, areas with lower SVI scores generally reflect populations with greater access to resources and adaptive capacity.

Spatial patterns in the SVI map suggest that higher social vulnerability is concentrated in portions of the central and southern areas of the city, where multiple vulnerability indicators overlap. These areas may experience disproportionate impacts during events such as flooding, extreme heat, earthquakes, or wildfire smoke episodes, particularly if hazards coincide with power outages, transportation disruptions, or prolonged recovery periods. Residents in higher-SVI neighborhoods may also face challenges accessing emergency information, evacuation assistance, sheltering, and post-disaster financial or housing resources.

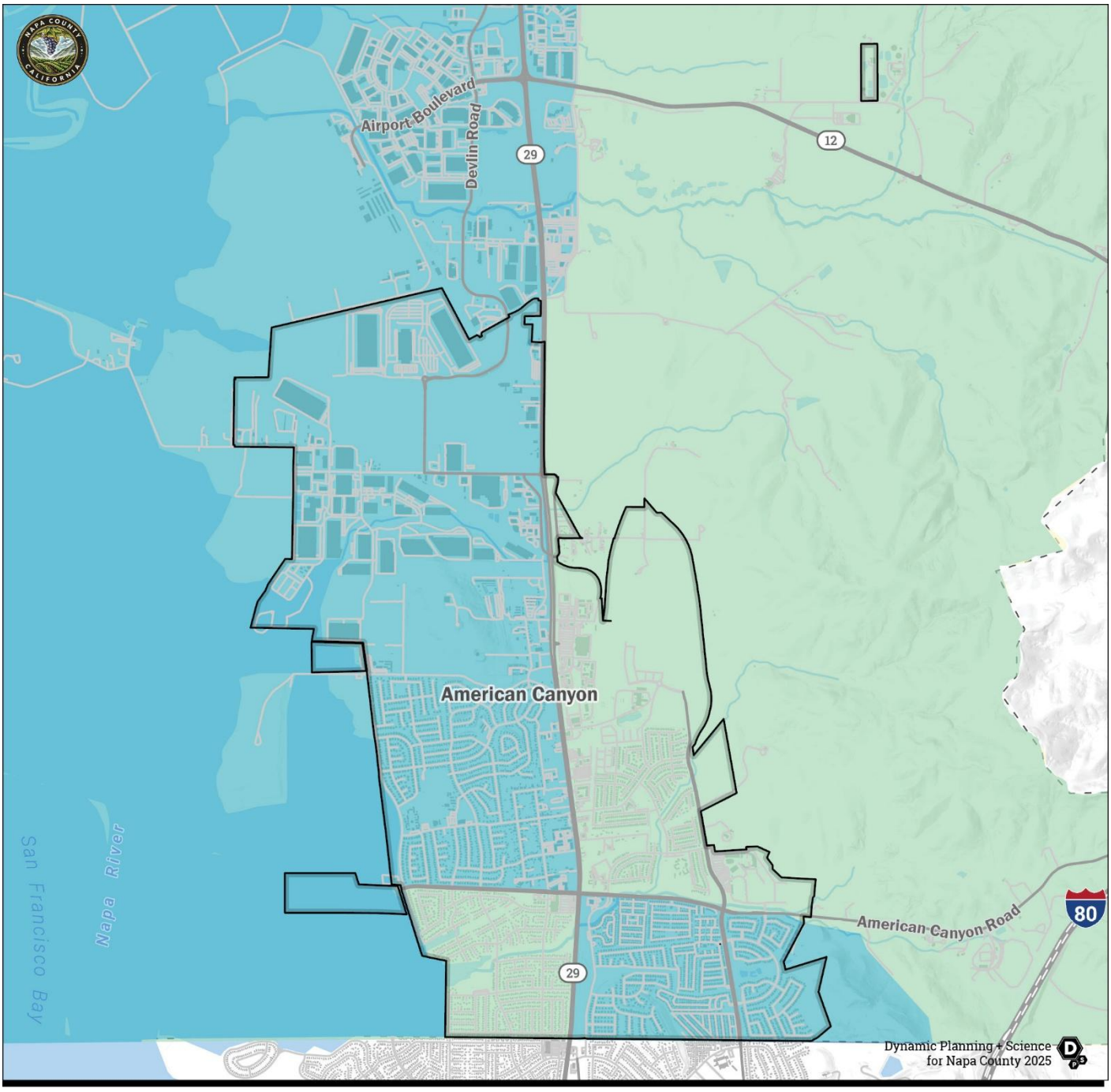


Figure 1-9: City of American Canyon CDC Social Vulnerability Index Map

1.2.3 Economy

The City of American Canyon plays an important economic role within southern Napa County, serving as a regional employment center and gateway to the Napa Valley. The local economy is supported by a diverse mix of industrial, logistics, manufacturing, commercial, and service-sector activities, as well as businesses tied to the regional wine industry. American Canyon's location along State Route 29 and its proximity to Interstate 80 provide direct access to regional transportation networks, making the city attractive for distribution, warehousing, and industrial uses.

Industrial and business park areas located primarily in the northern and western portions of the city host a concentration of employment-intensive uses, including wine production facilities, food and beverage manufacturing, logistics operations, and light industrial businesses. These employment centers contribute significantly to local tax revenues and provide jobs for residents of American Canyon and surrounding communities. At the same time, the concentration of economic activity in these areas increases the importance of protecting critical infrastructure, transportation corridors, and utility systems from natural hazards such as flooding, earthquakes, and power outages.

The city's commercial economy includes neighborhood-serving retail, restaurants, and personal services that support daily needs and contribute to community vitality. These businesses are particularly sensitive to hazard-related disruptions, as temporary closures, infrastructure damage, or reduced access can result in lost income and longer-term economic impacts. Small businesses may have limited capacity to absorb prolonged disruptions, making economic resilience an important consideration in hazard mitigation planning.

A significant portion of American Canyon's workforce is employed in sectors that involve physical labor or outdoor activity, including industrial operations, logistics, construction, and public services. These workers may face heightened exposure to hazards such as extreme heat, wildfire smoke, and poor air quality. Climate change projections indicating more frequent heat events and longer wildfire seasons have implications for worker safety, productivity, and business continuity within these sectors.

Economic vulnerability is also influenced by income variability and employment stability. Workers in hourly or service-based positions may experience immediate income loss during disaster-related closures or evacuations, which can compound household vulnerability and slow community recovery. Protecting employment centers, maintaining transportation access, and ensuring continuity of utilities and communications are therefore key components of reducing economic disruption from hazard events.

1.2.4 Growth Trends & Future Development

The City of American Canyon has experienced steady growth since its incorporation, with development patterns shaped by adopted growth management policies, infrastructure capacity, and regional housing demand. Growth in recent decades has occurred primarily through planned residential development, mixed-use projects, and expansion of industrial and business park areas within the city's established urban footprint. This approach reflects the city's long-standing emphasis on directing growth toward areas that

can be efficiently served by public services and infrastructure while limiting outward expansion into agricultural and environmentally sensitive lands.

Residential growth has been driven largely by approved specific plans and infill development within existing neighborhoods. Recent development activity has included a mix of single-family and multi-family housing intended to accommodate population growth and meet state-mandated housing requirements. The city's Housing Element and Annual Progress Reports document continued efforts to increase housing supply while addressing affordability, infrastructure demands, and community character.

Future development in American Canyon is expected to continue focusing on buildout of remaining developable parcels within the Urban Limit Line and Sphere of Influence. Planned growth areas are generally located near existing transportation corridors, utilities, and employment centers, supporting more compact and efficient development patterns. This strategy reduces the need for extensive new infrastructure and helps limit exposure to hazards associated with hillside development, wildfire risk, and access constraints.

Economic development is also anticipated to remain a key component of future growth. Expansion and intensification of industrial and commercial uses, particularly those related to logistics, manufacturing, and the wine industry, are expected to support employment and fiscal stability. At the same time, continued development in low-lying areas and near critical transportation routes underscores the importance of incorporating hazard mitigation and climate adaptation measures into future land use and infrastructure planning.

1.3 Planning Process

The City of American Canyon followed the planning process detailed in Volume 1, Section 2, including participating in the county-wide Hazard Mitigation Planning Team (HMPT) and formulating their own internal planning team to support the broader planning process.

The city's representatives in the Steering Group led stakeholder and public engagement efforts alongside the Consultant Team, with assistance from the county-wide HMPT and their internal planning team. This engagement process is described in Volume 1. Specifically, for the City of American Canyon, this included postings to the city website and social media, and outreach events, as documented in Appendix B. Examples of Key Stakeholders engaged by Napa County on behalf of the city with relevance to the development of American Canyon's mitigation strategy include the USDA and other federal agencies; CAL FIRE and other state agencies; other jurisdictions; community-based organizations such as local Chamber of Commerce chapters; utility providers like PG&E; UC Davis and other academia; and local businesses.

All Key Stakeholders that were invited to participate in the planning process are listed in Volume 1, Section 2, and the input received from stakeholders was integrated into the city's annex, as described in Volume 1 Table 2-9. The city's internal planning team participants, their positions, and how they participated in the planning process are shown in Table 1-8.

Table 1-8: City of American Canyon Planning Team and Steering Group Members

Team Members	Title	Description of Involvement
Dominic Patrick	**Water Systems Manager**	**Lead Point-of-Contact, HMPT #1, and #2, BO #1**
Alexandra Ikeda	**Deputy City Manager**	**Alternate Point-of-Contact, HMPT #4**
Erica Ahmann Smithies	Public Works Director	Participating Stakeholder, BO #1 and #2
Jason Holley	City Manager	Participating Stakeholder, BO #1

City of American Canyon participated in a comprehensive hazard mitigation planning process as part of the 2026 Napa County MJHMP update. This included a series of breakout meetings, listed in Table 1-9 that engaged the district's planning team, which included key city personnel and stakeholders in evaluating hazards, identifying local vulnerabilities, and prioritizing mitigation strategies

The process began with a County-Wide Steering Group Kickoff Meeting on February 28, 2024. This initial meeting focused on welcoming participants, establishing a shared understanding of the project scope and schedule, clarifying roles and responsibilities of the Steering Group, the county-wide Hazard Mitigation Planning Team (HMPT), and individual jurisdictional planning teams, and included a review of key changes since the 2020 Local Hazard Mitigation Plan The meeting set the foundation for coordinated participation throughout the planning effort.

On December 10, 2025, participants engaged in a hexagon mapping activity designed to visually identify mitigation actions that could benefit from or require inter-jurisdictional coordination. These collaborative efforts helped shape a refined set of mitigation alternatives, establish shared planning goals, and align local strategies with FEMA's Hazard Mitigation Assistance (HMA) funding framework.

Throughout the series of breakout meetings, the City of American Canyon engaged in a structured and collaborative planning process focused on assessing hazard risks, identifying vulnerabilities, and developing targeted mitigation strategies. The meetings began with recaps of the county-wide HMPT meetings to ensure alignment of goals and progress.

During the October 1, 2024, breakout out meeting, discussions concentrated on community engagement outcomes, initial risk assessments, and the integration of demographic data to better understand vulnerable populations. Jurisdictional teams reviewed their specific hazard exposures using the Risk Assessment Mapping Platform (RAMP) and participated in prioritization exercises to identify their top hazards.

The January 29, 2026, breakout meeting shifted toward reviewing local capabilities and defining specific areas of concern, which informed the drafting of problem statements. Teams worked collaboratively to refine mitigation alternatives, align actions with FEMA guidelines, and develop a shortlist of priority mitigation actions and inter-jurisdictional collaboration opportunities.

The meetings also included consensus-building activities around hazard rankings, capabilities, and planned actions, while providing regular updates on the overall project schedule.

Table 1-9: City of American Canyon Planning Team Meetings

Meeting & Date	Agenda / Topics	Goals / Key Inputs
County-Wide Steering Group and HMPT Kick-off and Meetings #1 & #2 February 28, 2024– July 18, 2024		
American Canyon Planning Team Breakout Meeting #1 October 1, 2024	▪ County-wide HMPT meetings #1 and #2 recaps ▪ Community engagement progress and results ▪ Risk assessment and community vulnerability ▪ Demographics and vulnerable populations ▪ Overview of jurisdiction-specific hazard risks and exposure ▪ Introduction to Risk Assessment Mapping Platform (RAMP) ▪ Jurisdiction-specific hazard risk ranking exercise ▪ Project schedule updates and next steps	▪ Consensus on jurisdiction-specific priority hazards ▪ Identify capabilities and potential mitigation actions ▪ Community engagement volunteers
County-Wide HMPT Meeting #3 March 25, 2025		
American Canyon Planning Team Breakout Meeting #2 January 29, 2026	▪ Breakout Meeting #1 and HMPT #3 recaps ▪ Review capabilities assessment ▪ Review areas of concern and define problem statements ▪ Principles of effective mitigation strategies and actions, and mitigation alternatives ▪ Refine and align jurisdiction-specific mitigation actions exercise ▪ Project schedule updates and next steps	▪ Consensus on jurisdiction-specific capabilities ▪ Consensus on jurisdiction-specific areas of concern ▪ Consensus on priority mitigation actions and collaboration opportunities ▪ Community engagement volunteers
County-Wide HMPT Meeting #4 December 10, 2025		

1.3.1 Public Input & Draft Review

As detailed in Volume 1, Section 2, the draft plan was available for public review and comment from May 15 to June 2, 2026. Public comments received during that time were similar to those gathered throughout the public engagement process, including the need for more equity in the distribution of mitigation activities and funding and the need for enhanced cooperation among jurisdictions, utility providers, and state agencies. These comments were incorporated into the city's mitigation strategy, as appropriate; although, most were already addressed by the Mitigation Action Plan which was based on previous public input.

Public and stakeholder input was gathered and incorporated throughout the plan development process, before the public review period, such as from the online public survey (see Volume 1, Section 2.1.2 and

Appendix B, for details). During the review period, jurisdictional staff and stakeholders that participated in the plan development also reviewed the public draft and provided comments on minor corrections and revisions, which were addressed in the final plan.

1.4 What's New

This section provides an overview of hazard mitigation planning efforts for the planning area and highlights the updates made in the 2026 MJHMP. The City of American Canyon previously participated and maintained a Hazard Mitigation Plan, which guided resilience planning and hazard mitigation actions at the city level. American Canyon is updating their current plan on a county wide level. This integration reflects the city's ongoing commitment to regional resilience and acknowledges that many hazards such as coastal flooding, severe storms, and earthquakes cross jurisdictional boundaries.

Through participation in the MJHMP, American Canyon has identified its highest priority hazards, developed hazard specific problem statements, and proposed actionable strategies to reduce risks. By aligning with countywide partners and leveraging regional resources, American Canyon has strengthened its capacity to prepare for, withstand, and recover from disasters while continuing to protect its unique coastal community character.

1.4.1 Mitigation Activities

The city has successfully implemented several initiatives aimed at addressing identified vulnerabilities. Some of these accomplishments are highlighted in this section and have directly contributed to reducing risks from hazards such as flooding, all hazards, and severe weather. These completed projects showcase American Canyon's ability to effectively plan, fund, and execute measures that protect its residents and infrastructure.

In addition, American Canyon has systematically reviewed and adjusted its mitigation actions, exemplifying adherence to FEMA's Planning Policy Guide principles and emphasizing the importance of dynamic and adaptive mitigation planning. By fostering partnerships, leveraging funding opportunities, and prioritizing equity in implementation, the city aligns with best practices to build resilience against natural disasters. This ongoing effort is a testament to the city's commitment to the principles of risk-informed decision-making, equitable resource allocation, and integration with broader regional and state hazard mitigation objectives.

Adjustments to Previous Mitigation Actions

A significant portion of the city's mitigation efforts remain ongoing or in the pipeline. These actions, ranging from infrastructure upgrades to community outreach initiatives, represent the city's proactive approach to addressing hazards as resources become available.

Recognizing constraints such as limited funding, staffing, and shifting priorities, the city has reevaluated certain initiatives, leading to their reprioritization or canceling of mitigation actions. Factors such as feasibility, cost-effectiveness, and emerging risks informed these decisions, ensuring alignment with the

city's updated hazard mitigation goals. Adjustments to previous mitigation actions are documented as part of the City of American Canyon's Mitigation Action Plan Table 1-17, and more specific status updates are provided in Table 1-18.

1.4.2 Mitigation Successes

Since the adoption of the 2021 Hazard Mitigation Plan, the City of American Canyon has made measurable progress in implementing mitigation actions that reduce risk and enhance community resilience. These successes reflect the City's continued commitment to integrating hazard mitigation into local planning, capital improvement projects, and community programs.

The following success stories highlight completed and ongoing efforts that address key hazards such as wildfire, flooding, and infrastructure vulnerability. Collectively, these initiatives demonstrate the city's ability to move from planning to implementation by leveraging partnerships, securing funding, and advancing projects that provide long-term risk reduction benefits to the community.

Vegetation Management

In September 2023, the City of American Canyon, in partnership with Napa County Fire, the American Canyon Fire Protection District, and the Napa Communities Firewise Foundation, implemented a sheep grazing program as a natural vegetation management strategy (Figure 1-10). The program utilizes sheep from a local producer to reduce dry grasses and other flammable vegetation in targeted areas, supporting wildfire risk reduction while aligning with the city's sustainability and environmental stewardship goals.

Sheep grazing provides an effective alternative to conventional vegetation management methods that rely on chemical herbicides or heavy machinery. The approach improves soil health through natural fertilization, enhances biodiversity, and allows for quiet, non-disruptive treatment of areas that may be difficult to access with equipment. By reducing fuel loads, the program helps create a more fire-resistant landscape and improves visibility in parks, vacant lots, and public spaces, contributing to both wildfire mitigation and community safety.

The grazing program also represents a cost-effective and environmentally responsible mitigation measure. By lowering long-term vegetation management costs, the city is able to allocate resources more efficiently while advancing public safety, climate resilience, and ecological health. This initiative demonstrates American Canyon's commitment to innovative, sustainable hazard mitigation practices that reduce wildfire risk and support overall community resilience.



Figure 1-10: American Canyon Grazing

Wetlands Restoration and Public Access Project

In June 2025, the San Francisco Bay Restoration Authority (SFBRA) awarded the City of American Canyon a $1,200,000 Measure AA grant to advance Phase II of the American Canyon Wetlands Restoration and Public Access Project. This funding supports planning-phase activities that will lay the groundwork for future habitat restoration, flood risk reduction, and public access improvements along the lower Napa River shoreline.

Phase II will build on earlier studies and outreach by completing detailed technical investigations, 60 percent design documents, California Environmental Quality Act (CEQA) documentation, and draft regulatory permit applications. The project area includes more than 60 acres of wetlands and adjacent transitional upland habitat along the North Slough and Lower Napa River, an ecologically significant landscape that supports migratory birds, fish species, and other wildlife.

A key element of the Phase II work is to improve the resilience of the San Francisco Bay Trail by raising approximately 1.2 miles of existing trail out of the floodplain, increasing its ability to withstand future sea level rise and reduce seasonal flooding impacts. The project also aims to improve fish passage, enhance water quality, and expand public safety and recreation opportunities, including development of a new Bay Water Trail trailhead and associated facilities.



Figure 1-11: Wetlands Edge Project

Stormwater Program Implementation

Stormwater program implementation (ongoing) to reduce flooding/erosion and protect water quality. The City's stormwater program description emphasizes reducing flooding and erosion and participating in the Napa Countywide Stormwater Pollution Prevention Program for consistent stormwater regulation across Napa County municipalities.

Updated Safety Element

The Safety Element update includes multiple mitigation-forward policies such as tailored evacuation messaging for single-access neighborhoods, assessing ingress/egress improvements, zone-based evacuation planning, siting critical infrastructure outside hazard zones where feasible, and maintaining participation in the Napa County MJHMP update cycle.

1.5 Risk Assessment

This section focuses on profiling hazards specific to the City of American Canyon and assessing vulnerability independent of the broader county-wide planning area, which has been evaluated in Section 3 of Volume 1. The hazard profiles in Volume 1 discuss overall impacts to the planning area and describe relevant plans, policies, and regulations; past events; location; frequency and probability of future occurrences; severity and extent; warning time; secondary hazards; and climate change impacts. For more information on risk assessment methodologies, see Volume 1, Appendix A.

This section includes a tailored vulnerability assessment, analyzing assets at risk such as population, property, and critical facilities and infrastructure unique to the city, and information on city-specific differences in hazard vulnerability across the planning area. It also identifies total city assets at risk, including people, property, and critical facilities and infrastructure within the city. In addition, this section presents growth and development trends for the community, offering insights into vulnerabilities and risks that represent the broader context of assets at risk.

1.5.1 Hazard Screening & Prioritization

Members of the Planning Team from each participating jurisdiction came together to collaboratively decide which county-wide hazards would be included in the MJHMP, and which would be excluded. Hazard screening and prioritization took place early in the process and integrated historic data, local knowledge, and consensus opinions to create a risk assessment matrix for the county as well as for each participating jurisdiction. These matrices indicate the priority of hazards prior to further refinement. Details about this process, the results of the discussion, and in-depth profiles for county-wide hazards can be found in Volume 1, Sections 2 and 3.

The City of American Canyon's internal planning group used the same hazard identification and prioritization process as the county-wide Planning Team. They reviewed previously prepared hazard mitigation plans and other relevant documents to determine the realm of natural hazards that have the potential to affect the city. Table 1-10 provides a crosswalk of hazards identified in select planning

documents, including the 2020 Napa County MJHMP, 2025 City of American Canyon General Plan, and the 2023 State of California HMP. The crosswalk was used to develop a preliminary hazards list, providing a framework for the group to evaluate which hazards were truly relevant to the City of American Canyon and which ones were not.

The internal planning group then ranked hazards based on their probability of affecting City of American Canyon and potential impacts on the community. Figure 1-12 displays the results of the hazard risk ranking exercise that was performed before further refinement. All hazards have been profiled in Volume 1 of this document. The purpose of this annex is to specifically address the city's vulnerability to specifically identified hazards.

Table 1-10: City of American Canyon Document Review of Potential Hazards

Hazard	2020 Napa County MJHMP	2025 City of American Canyon General Plan	2023 California SHMP
Agricultural Pests	■		■
Avalanche			■
Climate Change	■	■	■
Coastal			■
Dam Failure	■		■
Drought	■	■	■
Earthquake / Liquefaction	■	■	■
Extreme Cold			■
Extreme Heat		■	■
Extreme Weather / Storms	■	■	■
Flood	■	■	■
Geologic / Mass Movement	■	■	■
Human-Caused			■
Insects			■
Levee Failure			■
Pandemic Disease	■		■
Sea Level Rise			■
Soil			■
Subsidence			■
Tornado			■
Tsunami / Seiche Wave			■
Volcano			■
Wildfire	■	■	■

Risk Assessment Matrix Definitions

PROBABILITY RATING

The likelihood of a hazard event occurring within a time period?

PROBABILITY

- **Highly Likely** - 100% annual probability. Or Likely to occur every year in your lifetime.
- **Likely** - between 10 & 100% annual probability. Or will occur several times in your lifetime.
- **Possible** - between 1 & 10% annual probability. Or Likely to occur some time in your lifetime.
- **Unlikely** - less than 1% annual probability. Or unlikely but possible to occur in your lifetime.

IMPACT RATING

In terms of injuries, damage, or death, would you anticipate impacts to be minor, limited, critical, or catastrophic when a significant hazard event occurs? The impact could be in terms of one hazard event (flooding from a culvert failure) or a large-scale event (multiple rivers flooding) in the same jurisdictional boundary.

IMPACT

Minor	Limited	Critical	Catastrophic

Minor - very few injuries, if any. Only minor property damage & minimal disruption on quality of life. Temporary shutdown of critical facilities.

Limited - minor injuries only. Approx. 10% or less of property in disaster footprint damaged or destroyed. Complete shutdown of critical facilities for more than one day.

Critical - multiple deaths/injuries possible. Between 25% and 50% of property in disaster footprint is damaged or destroyed. Complete shutdown of critical facilities for more than one week.

Catastrophic - high number of deaths/injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for 30 days or more.

To concentrate resources, the jurisdictional planning team will focus on "High" and "Extreme" risk hazards, and "Medium" risk hazards to a lesser extent. These hazards have the higher probability and greater impact as it relates to the jurisdictions planning area.

Hazard definitions are included in **Vol. 1** of this plan. Some hazards are discussed as subset hazards— e.g., "Levee Failure" within the "Flood" hazard profile. If a hazard is not present on the risk matrix, is grey, or categorized as a "Low" risk hazard, the jurisdictional planning team felt the hazard had a minimal footprint or impact within their planning area and chose not to profile the hazard.

Hazard Information / Legend:



Climate Change impacts will be addressed within each relevant hazard section within the plan update and as a stand alone section for each jurisdiction. Climate change may change the frequency, duration, or intensity of other hazards profiled.

City of American Canyon Risk Matrix

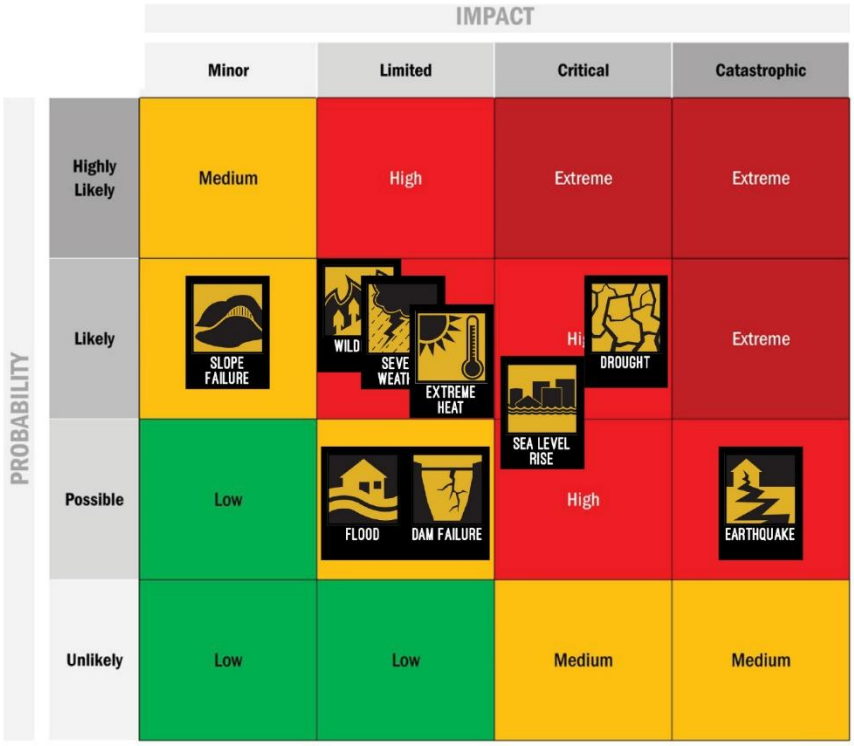


Figure 1-12: City of American Canyon Risk Assessment Matrix

Note: Hazard naming in the Risk Assessment Matrix may not match the final naming used. Refer to hazards prioritization summary table.

Priority Hazards

The results of the initial risk ranking exercise completed by the city's Planning Team, before further refinement, are identified in the county's completed matrix in Figure 1-12. Table 1-11 provides the final list of priority hazards and subhazards with additional details about why certain hazards were chosen and why others were not prioritized. However, it should be noted that many hazards not prioritized for profiling are briefly discussed as secondary or compounding hazards, and subhazards that were profiled and included in the risk assessment are listed specifically.

Table 1-11: City of American Canyon Hazards Prioritization Summary

Hazard	Priority	Explanation
Earthquake / Liquefaction	**High**	Profiled in Volume 1, Section 3.3.4, and Section 1.5.2.4 in this annex, including Liquefaction
Wildfire	**High**	Profiled in Volume 1, Section 3.3.1, and Section 1.5.2.1 in this annex
Flood	**Medium**	Profiled in Volume 1, Section 3.3.2, and Section 1.5.2.2 in this annex, including Levee Failure
Levee Failure	**Medium**	Profiled in Volume 1, Section 3.3.2, and Section 1.5.2.2 in this annex under Flood
Extreme Weather / Storms	**High**	Profiled in Volume 1, Section 3.3.5, and Section 1.5.2.7 in this annex as Severe Weather, including High Wind and Heavy Rain (Winter Weather not a priority due to low probability and impact potential)
Drought	**High**	Profiled in Volume 1, Section 3.3.6, and Section 1.5.2.6 in this annex
Geologic / Mass Movement	**Medium**	Profiled in Volume 1, Section 3.3.5, and Section 1.5.2.5 in this annex as Slope Failure
Extreme Heat	**High**	Profiled in Volume 1, Section 3.3.8, and Section 1.5.2.8 in this annex
Agricultural Pests	-	Profiled in Volume 1, Section 3.3.9; not a priority due to low probability and impact potential
Sea Level Rise	**High**	Profiled in Volume 1, Section 3.3.9, and Section 1.5.2.9 in this annex under Climate Change
Climate Change	**High**	Profiled in Volume 1, Section 3.3.9, and Section 1.5.2.9 in this annex, including Sea Level Rise, and discussed as a compounding hazard in relevant profiles
Dam Failure	**Medium**	Profiled in Volume 1, Section 3.3.3, and Section 1.5.2.3 in this annex

1.5.2 Vulnerability to Specific Hazards

Assessing vulnerabilities exposes the unique characteristics of individual hazards and begins the process of narrowing down which areas within the city are vulnerable to specific hazard events. The vulnerability assessment considered unique local knowledge of hazards and impacts and a GIS overlaying method for examining such vulnerabilities in more depth. Using these methods, the city's planning group estimated vulnerable populations, properties, and assets, and potential losses. In addition, the exposure of city assets to drought, geological, earthquake, wildfire and flood hazards were also considered.

Many of the hazard profiles include a snapshot map and damage estimation tables that illustrate the city's vulnerabilities to those specific hazards. These maps assisted the planning group in understanding the hazard exposure of populations, parcels, and critical facilities and infrastructure. Each snapshot map contains an exposure summary that displays the percentage of the population, the improvement and content value of parcels, and the amount of critical infrastructure that is exposed. For hazards without geospatial extents, such as drought and severe weather, narratives are provided instead of exposure maps and tables.

Based on the hazard prioritization exercise, this vulnerability assessment focuses on seven hazards for the City of American Canyon, some of which encompass sub hazards such as Liquefaction and Heavy Rain

Wildfire
SECTION 1.5.2.1



Flood
SECTION1.5.2.2



Dam Failure
SECTION 1.5.2.3



Earthquake
SECTION 1.5.2.4



Slope Failure
SECTION 1.5.2.5



Drought
SECTION 1.5.2.6



Severe Weather
SECTION 1.5.2.7



Extreme Heat
SECTION 1.5.2.8



Climate Change
SECTION 1.5.2.9



1.5.2.1 Wildfire Hazard

Wildfire risk in the City of American Canyon is primarily concentrated along the eastern and western edges of the community, where developed areas interface with open space, wetlands, and the foothills of the Sulphur Springs Mountain Range. The wildfire risk exposure map, Figure 1-13, shows that portions of the city and surrounding Sphere of Influence are located within Moderate and High Fire Hazard Severity Zones, particularly in areas adjacent to undeveloped land and wildland vegetation.

The eastern boundary of American Canyon, which transitions into rolling hills and open space east of State Route 29 and near American Canyon Road, is characterized by Moderate wildfire hazard. These areas contain grasslands, shrubs, and seasonal vegetation that can dry rapidly during summer and fall months, increasing the potential for fast-moving fires under windy or extreme heat conditions. Residential neighborhoods located near this wildland–urban interface (WUI) may face heightened risk related to ember intrusion, evacuation constraints, and access limitations during wildfire events.

Moderate-high wildfire hazard areas are also present along portions of the City's western edge near the Napa River and adjacent wetlands. While these areas are influenced by tidal waters and marsh conditions that generally reduce ignition potential, seasonal drying of vegetation and wind conditions can still contribute to localized wildfire risk, particularly during extended drought periods.

The exposure summary associated with the wildfire risk map indicates that, within current mapped hazard areas, there are no permanent residential populations, parcels, or critical infrastructure classified within the Very High Fire Hazard Severity Zone inside city limits. As a result, population exposure, parcel exposure, and critical infrastructure exposure rates within the highest hazard category are reported as zero percent. This reflects American Canyon's relatively urbanized development pattern and limited extent of very high-risk wildfire terrain within incorporated boundaries.

Despite the absence of Very High Fire Hazard Severity Zones within the city, wildfire remains an important planning consideration due to proximity to higher-risk areas outside city limits, regional wildfire activity, and secondary impacts such as smoke exposure, power shutoffs, transportation disruptions, and evacuation demands. Climate change projections indicating hotter temperatures, longer dry seasons, and increased frequency of extreme weather events are expected to exacerbate wildfire conditions throughout Napa County, including areas surrounding American Canyon.

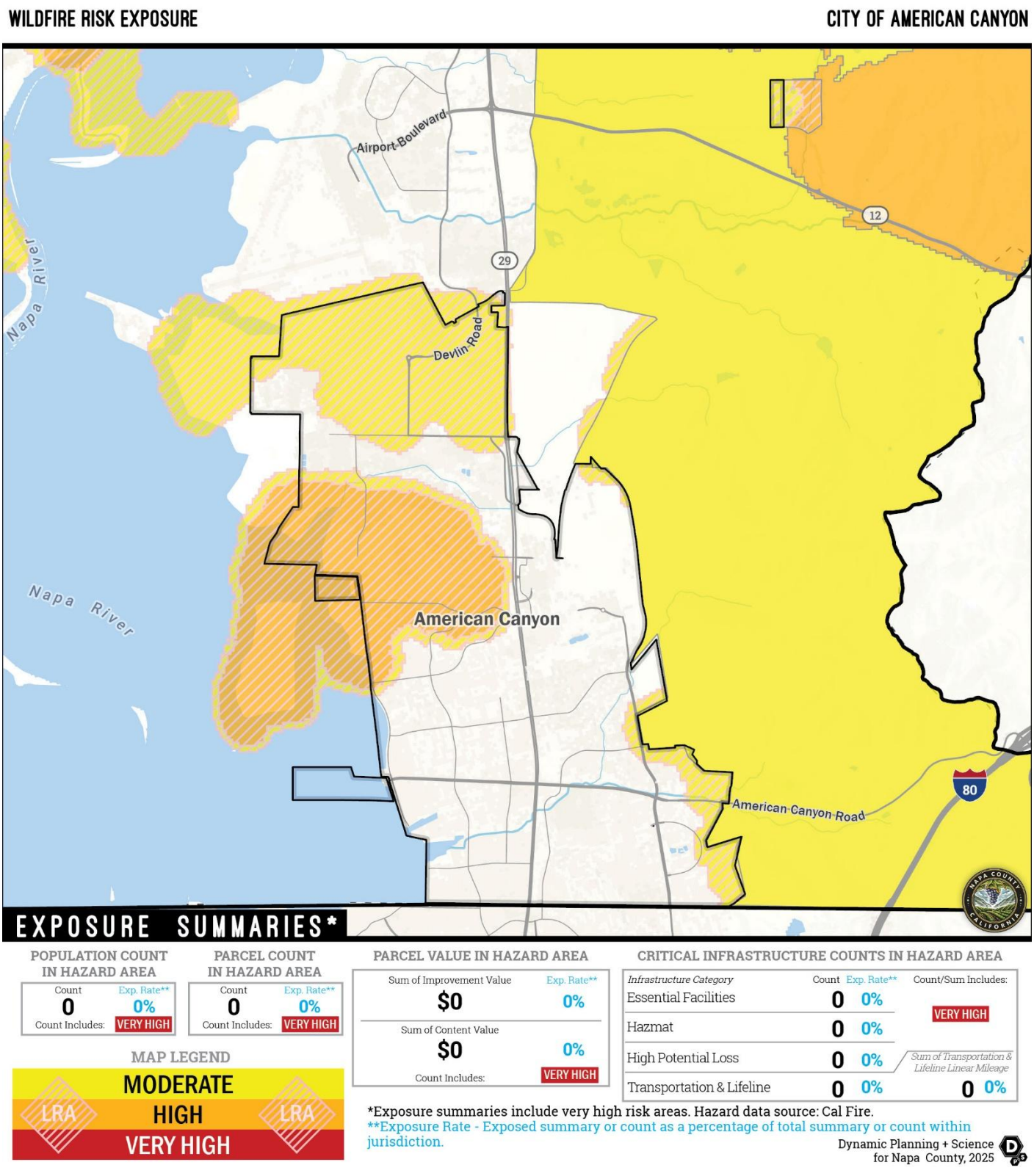


Figure 1-13: Exposure Summary – City of American Canyon Wildfire Risk

1.5.2.2 Flood Hazard

Flooding is a significant natural hazard for the City of American Canyon due to its low-lying topography, proximity to the Napa River, and location adjacent to San Pablo Bay. Portions of the City are subject to riverine flooding, tidal flooding, and storm-driven inundations, particularly during major precipitation events, high tides, or conditions influenced by sea level rise. Flood hazard areas within American Canyon are primarily concentrated along the western edge of the city near the Napa River and bayfront, as well as along localized drainage corridors.

The FEMA Flood Risk Exposure map, Figure 1-15, shows areas within the 100-year (1-percent annual chance) and 500-year (0.2-percent annual chance) floodplains, including mapped floodway areas and zones protected by levees. These flood-prone areas reflect the combined influence of river overflow, tidal backwater effects, and constrained drainage capacity. Flood hazards in these areas may be exacerbated during extreme storm events when high river flows coincide with elevated bay water levels.

Exposure analysis indicates that approximately 1,620 residents, representing around 7 percent of the city's population, are located within mapped flood hazard areas. In addition, over 200 parcels (about 3 percent of all parcels) are exposed to flooding, with an estimated $128 million in building improvement value and a similar amount in contents value at risk. While no essential facilities or hazardous materials sites are located within the mapped flood hazard areas, several transportation and lifeline facilities intersect flood-prone zones, highlighting the potential for access disruptions and service interruptions during flood events.

Flooding in American Canyon can result in structural damage to buildings, roadway inundation, utility system impacts, and long-term economic disruption. Repetitive or prolonged flooding may also affect industrial and commercial areas near the river, compounding recovery challenges. Secondary impacts include erosion, sediment deposition, and degradation of wetlands and shoreline infrastructure.

Climate change is expected to increase flood risk in American Canyon over time. Projections for sea level rise, more intense precipitation events, and higher storm surge heights may expand flood extents, increase flood depths, and reduce the effectiveness of existing levees and drainage systems. Areas currently mapped within the 500-year floodplain may experience more frequent flooding in the future, increasing exposure to residents, infrastructure, and economic assets.

National Flood Insurance Program

The National Flood Insurance Program (NFIP) makes federally backed flood insurance available to homeowners, renters, and business owners in participating communities. FEMA has prepared a detailed Flood Insurance Study (FIS) for Napa County and municipalities. The study presents water surface elevations for floods of various magnitudes, including the 1% annual chance flood (100-YR flood) and the 0.2% annual chance flood (500-YR flood). Base flood elevations and the boundaries of the 100- and 500-YR floodplains are shown on Flood Insurance Rate Maps (FIRMs), which are the principal tools for identifying the extent and location of the flood hazard. FIRMs are the most detailed and consistent data source

available, and for many communities they represent the minimum area of oversight under their floodplain management program. See Section 4 of Volume 1 for general information on the NFIP.

The City of American Canyon has participated in the NFIP since 1994 and has adopted the most recent FIRMs and FIS issued by FEMA (dated August 3, 2016) as well as local floodplain development regulations in compliance with the minimum NFIP standards (American Canyon Municipal Code Chapter 8.16). These minimum standards include procedures and provisions for substantial improvements and substantial damages to existing structures, the latter of which are employed by the floodplain administrator and city building inspectors following any hazard event affecting structures located in the flood hazard area in accordance with NFIP requirements. Regulations for substantial improvements are enforced via permitting procedures. Implementation and enforcement of the city's floodplain regulations are assigned to the City Manager, who serves as the floodplain administrator.

The City of American Canyon is currently in good standing with the provisions of the NFIP. Compliance is monitored by FEMA regional staff and by the California Department of Water Resources under a contract with FEMA. Maintaining compliance under the NFIP is an important component of flood risk reduction. See Table 1-12 for more information on the City's policies and historic flood insurance claims.

Table 1-12: City of American Canyon National Flood Insurance Program Information

City of American Canyon NFIP Status and Flood Insurance Statistics	
NFIP Status	Participating Since 1/11/94
Community Identification (CID)	060755
CRS Class (Entry Date)	N/A
Policies in Force (Total Coverage)	16 ($4,173,000)
Policies Inside SFHA / Outside SFHA	4 Inside / 12 Outside
Policies in Coastal Zones (Total Coverage)	N/A
Total Claims (Total Paid)	0 Claims ($0 Paid)
Repetitive Loss (RL) / Severe Repetitive Loss (SRL) Properties	No RL or SRL Properties
Repetitive Loss Payments	No RL Payments

Note: The number of policies is by property and does not count policies for individual buildings. The Privacy Act of 1974 (5 USC 522a) restricts the release of certain types of data to the public. Flood insurance policy and claims data is included in the list of restricted information. FEMA can only release such data to state and local governments, and only if the data is used for floodplain management, mitigation, or research purposes. Therefore, this plan does not identify the repetitive loss properties or include claims data for any individual property.

Principal Flooding Sources

The principal flooding source for the City of American Canyon is the Napa River, with secondary influence from tidal flooding associated with San Pablo Bay.

Riverine flooding from the Napa River is the primary driver of mapped flood risk in American Canyon. During major storm events, high river flows can overtop banks or exceed channel capacity, particularly along the City's western edge where development, wetlands, and infrastructure are adjacent to the river.

Tidal backwater effects from San Pablo Bay significantly influence flooding conditions in American Canyon. High tides can slow or prevent stormwater and river flows from draining efficiently into the bay, increasing flood depths and duration along the lower Napa River and adjacent low-lying areas. These effects are especially pronounced when high tides coincide with heavy rainfall.

Localized flooding from creeks, drainage channels, and stormwater systems occurs within the city but generally represents a secondary source compared to the combined riverine and tidal flooding associated with the Napa River system.

Levee Failure

Leveed floodplains and bayfront areas further define flood risk. Portions of American Canyon lie behind levees or within areas influenced by both the 100-year and 500-year floodplains. While levees provide protection under certain conditions, they can be overtopped or lose effectiveness during extreme events or with future sea level rise.

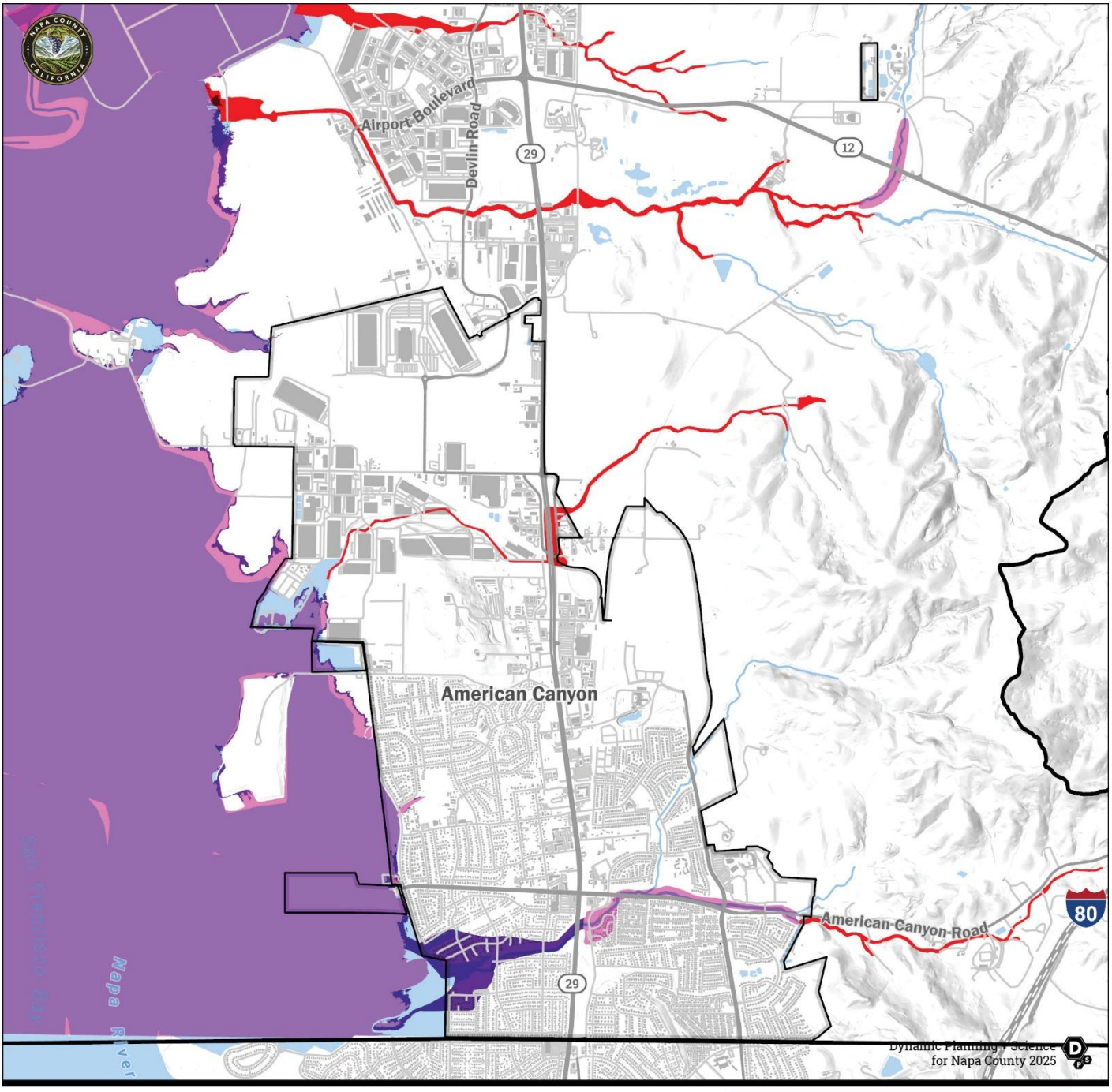


Figure 1-14: City of American Canyon Flood Risk (FEMA Zones and DWR Awareness Zone)

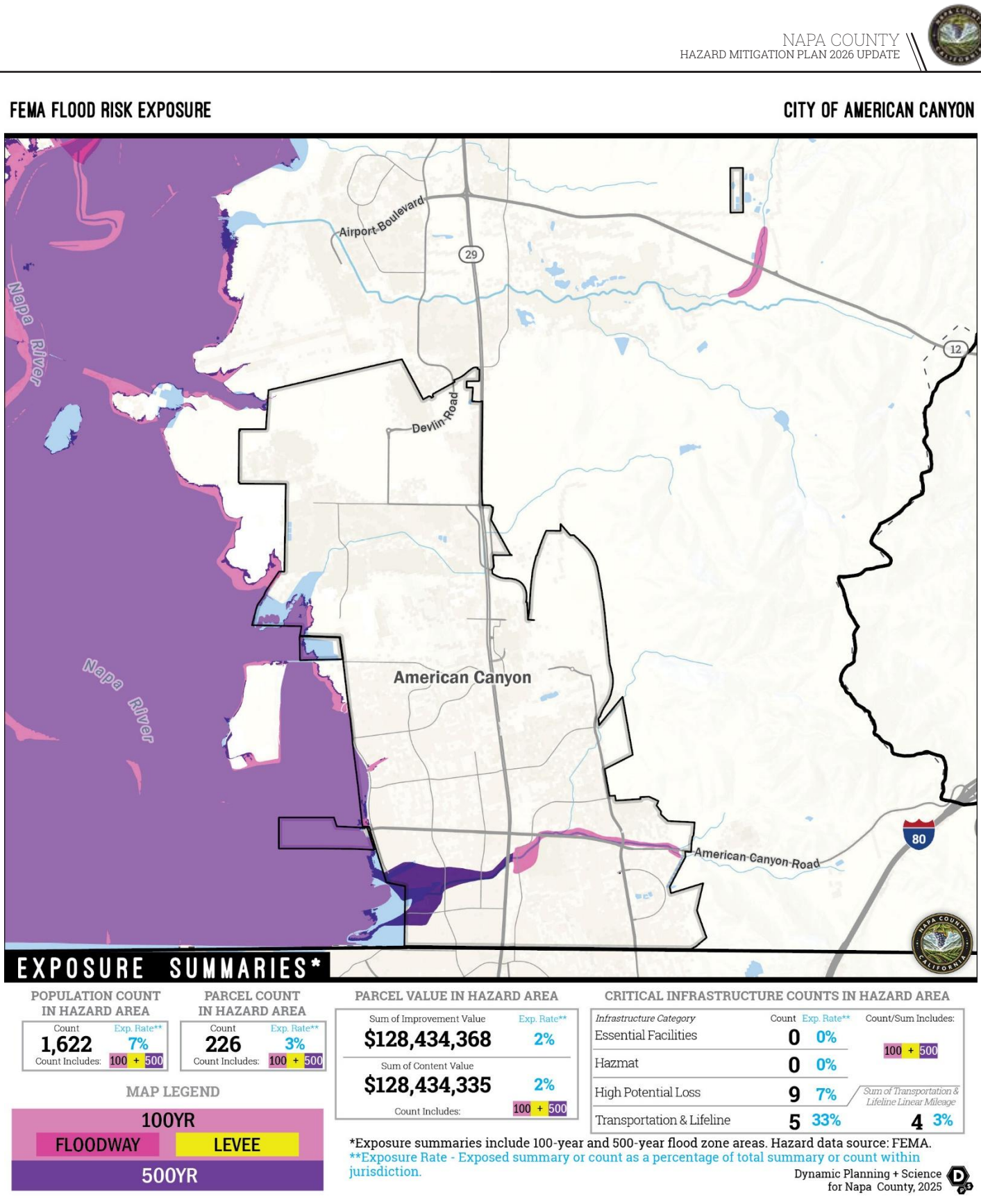


Figure 1-15: Exposure Summary – City of American Canyon Flood Risk (FEMA Zones)

1.5.2.3 Dam Failure Hazard

Dam failure represents a low-frequency but potentially high-consequence hazard within the City of American Canyon. Dam failure refers to the partial or complete structural failure of an upstream dam, resulting in the uncontrolled release of stored water. Figure 1-16 indicates that limited portions of the service boundary fall within mapped dam inundation zones. Exposure metrics identify approximately 89 residents, representing roughly 6 percent of the mapped population, and 65 parcels, or approximately 5 percent of parcels, as located within potential inundation areas. While the overall exposure footprint is comparatively small relative to other hazards, dam failure scenarios warrant consideration due to their rapid onset characteristics and potential severity.

Dam failure hazards are typically associated with structural failure, overtopping, seismic impacts, internal erosion, extreme precipitation events, or operational malfunctions affecting reservoir containment systems. In mountainous environments such as Howell Mountain, failure scenarios may produce sudden downstream flooding, high-velocity flow conditions, debris transport, and localized erosion. The steep terrain and confined drainage corridors characteristic of the region can amplify flow velocities and reduce warning times, increasing the potential for infrastructure damage and life safety risks.

Potential dam failure impacts within the City of American Canyon primarily relate to downstream flooding and associated secondary effects. Sudden inundation may damage residential structures, roadways, utility infrastructure, and distribution system components located within flood pathways. Floodwaters may also transport sediment, debris, and contaminants that affect water quality and treatment operations. Access routes critical for emergency response and infrastructure repair may be disrupted or rendered impassable.

Seismic hazards represent a particularly relevant consideration for dam failure risk. Earthquake events may induce structural stresses, foundation instability, or embankment damage affecting reservoir systems. Given the region's known seismic exposure, dam safety considerations are closely linked to broader geologic hazard planning. Extreme weather events, including intense rainfall or prolonged storm activity, may also influence reservoir performance through increased inflows, slope saturation, and erosion processes.

Although the mapped exposure rates for dam inundation are relatively low, the economic implications may be significant at the parcel level. Structures located within inundation zones may face elevated risk of damage, financial loss, and prolonged recovery timelines following a failure event. The Dam Inundation Exposure snapshot indicates tens of millions of dollars in parcel value within the hazard area, illustrating the potential economic consequences of a low-probability but high-impact scenario.

Dam safety oversight, inspection, and emergency action planning are managed at the state and regional levels, including by the California Department of Water Resources and the California Division of Safety of Dams. These agencies work with dam owners and local jurisdictions to monitor dam conditions and coordinate emergency notification procedures.

For the City of American Canyon, dam failure hazards also intersect with operational considerations. Reservoir integrity is fundamental to raw water storage, treatment reliability, and distribution continuity. Structural compromise of storage facilities may reduce system capacity, disrupt service delivery, and necessitate emergency repairs. Secondary effects such as sedimentation, contamination, or infrastructure access constraints may further affect system performance.

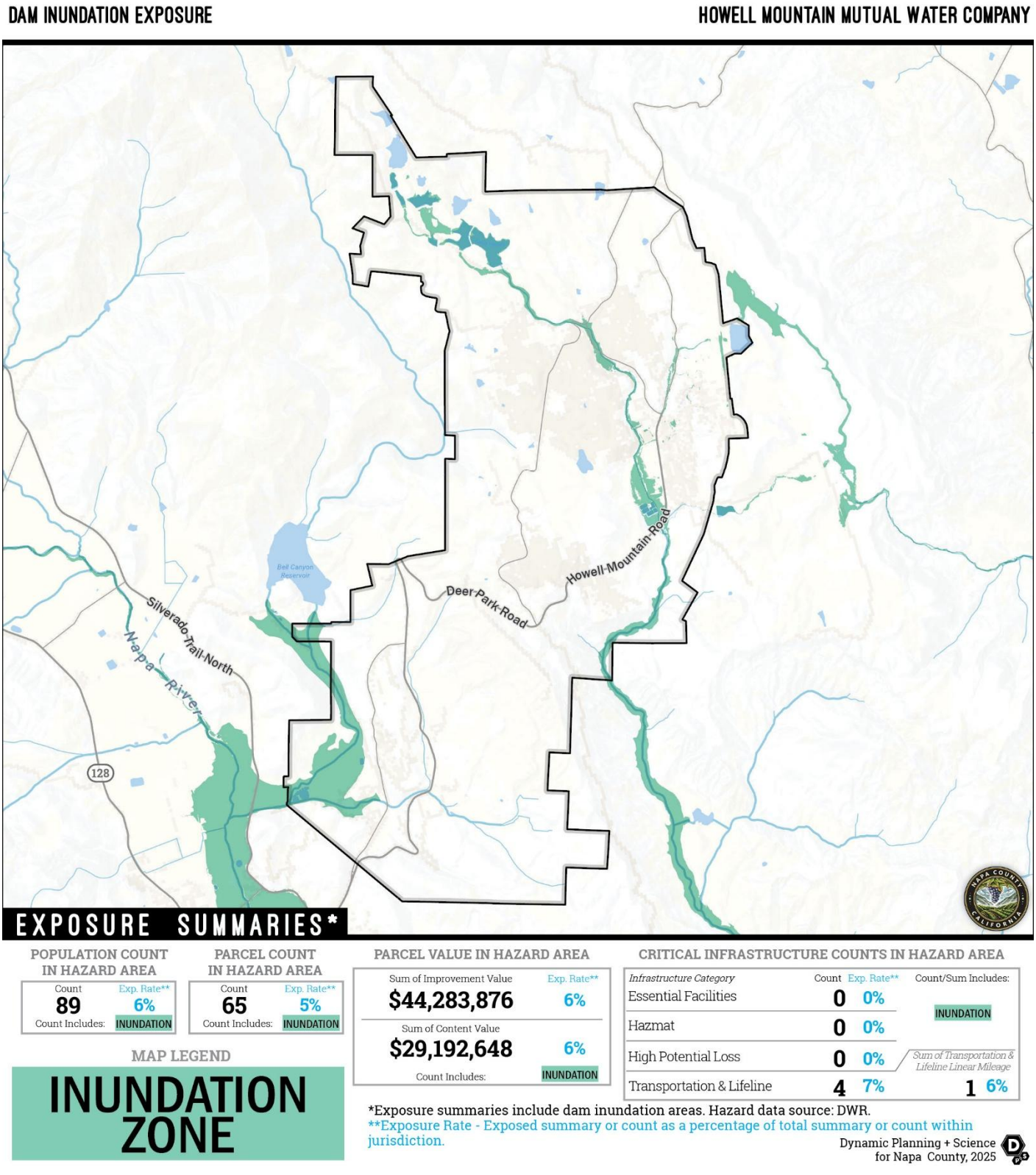


Figure 1-16: Exposure Summary – City of American Canyon Dam Inundation Zone

1.5.2.4 Earthquake Hazard

The City of American Canyon is subject to significant earthquake risk due to its location within the seismically active San Francisco Bay Area and proximity to multiple active faults in Napa County and the surrounding region. Earthquake impacts in the city are best illustrated through scenario modeling, including the Hunting Creek–Berryessa Earthquake Scenario (Magnitude 7.1) and the West Napa Earthquake Scenario (Magnitude 6.7). These scenarios reflect credible seismic events that could produce strong to severe ground shaking throughout the city.

Under the Hunting Creek–Berryessa M7.1 scenario (Figure 1-17), ground shaking across American Canyon is generally characterized as Moderate to Strong (Modified Mercalli Intensity [MMI] VI–VII). While exposure summaries indicate no population, parcels, or critical infrastructure located in the highest modeled intensity categories for this scenario within city limits, the widespread nature of strong shaking suggests possible but limited damage to buildings, infrastructure, and lifelines, particularly older structures and non-ductile construction.

The West Napa Earthquake M6.7 scenario, Figure 1-18, represents a more impactful event for American Canyon due to its closer proximity. Under this scenario, 100 percent of the City's population, parcels, and assessed parcel value are exposed to Strong to Very Strong shaking (MMI VII–VIII). Exposure summaries indicate that approximately 22,000 residents, 7,000 parcels, and nearly $7.0 billion in building improvement value and $7.6 billion in content value fall within these intensity ranges. In addition, all mapped critical infrastructure categories, including essential facilities, hazardous materials sites, high potential loss facilities, and transportation and lifeline systems, are exposed to damaging levels of ground shaking.

Earthquake impacts associated with these scenarios include structural damage to residential, commercial, and industrial buildings; failure of non-structural components; disruption of transportation corridors such as State Route 29 and American Canyon Road; and damage to utilities including water, wastewater, power, and communications systems.

Secondary earthquake hazards also present a concern for American Canyon. These include hazardous materials releases from industrial and commercial facilities, fires following earthquakes, prolonged power outages, and limited access for emergency response due to damaged roadways or bridges. Given the city's role as an employment center and transportation gateway in southern Napa County, such disruptions could have regional economic and public safety consequences.

Liquefaction

Liquefaction represents a significant secondary earthquake hazard for the City of American Canyon due to local soil conditions, groundwater characteristics, and proximity to the Napa River and San Pablo Bay. Liquefaction occurs when saturated, loose, fine-grained soils temporarily lose strength during intense ground shaking, causing the ground to behave more like a liquid. This phenomenon can result in ground settlement, lateral spreading, loss of bearing capacity, and damage to buildings, roadways, and buried

utilities. While liquefaction is a consideration in hazard mitigation planning, it is not profiled as a standalone hazard but addressed as a secondary earthquake effect.

Areas of American Canyon with higher liquefaction susceptibility are generally located in low-lying portions of the city underlain by young alluvial, estuarine, and bay-margin sediments. These conditions are most prevalent near the Napa River, wetlands, and former tidal areas, where shallow groundwater levels increase the likelihood of liquefaction during moderate to strong earthquake shaking (FIGURE). In these areas, even structures designed to withstand seismic forces may experience damage if foundations or supporting soils lose stability.

Liquefaction can significantly amplify earthquake impacts by damaging lifeline infrastructure such as water, wastewater, storm drainage, gas, and telecommunications systems. Buried pipelines may rupture or become misaligned, roadways and bridges may settle or deform, and access routes needed for emergency response may be compromised. Industrial and commercial areas located on susceptible soils may face additional risks related to hazardous materials releases if tanks, pipelines, or containment systems are affected.

The earthquake scenario analyses for American Canyon indicate that strong to very strong ground shaking (MMI VII–VIII) is likely under credible seismic events. When combined with local liquefaction-prone soils, these shaking intensities increase the potential for widespread ground failure in susceptible areas. As a result, liquefaction poses a threat not only to individual structures but also to the city's broader functionality and recovery following a major earthquake.

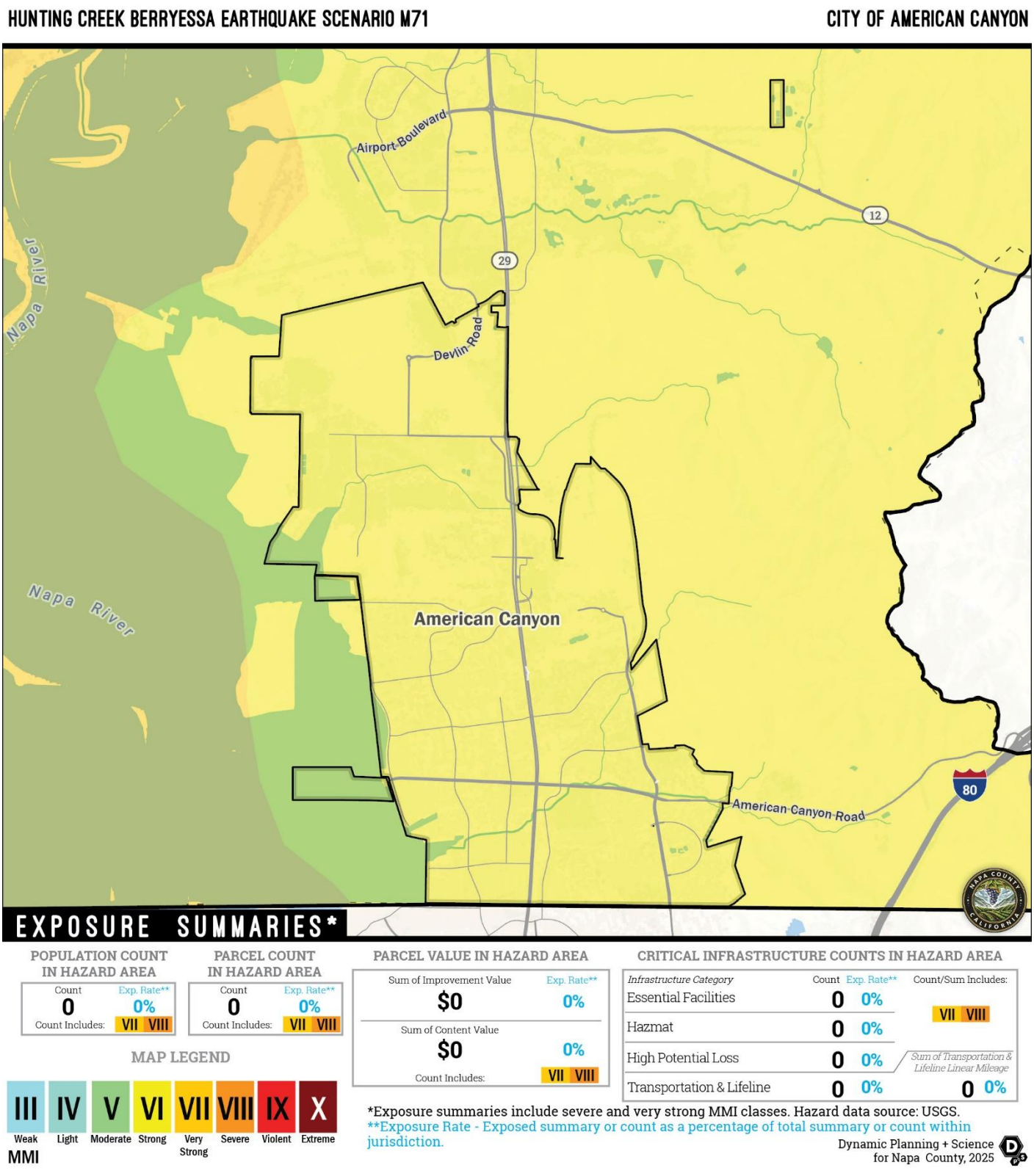


Figure 1-17: Exposure Summary – City of American Canyon Earthquake Risk (M7.1 Hunting Creek–Berryessa)

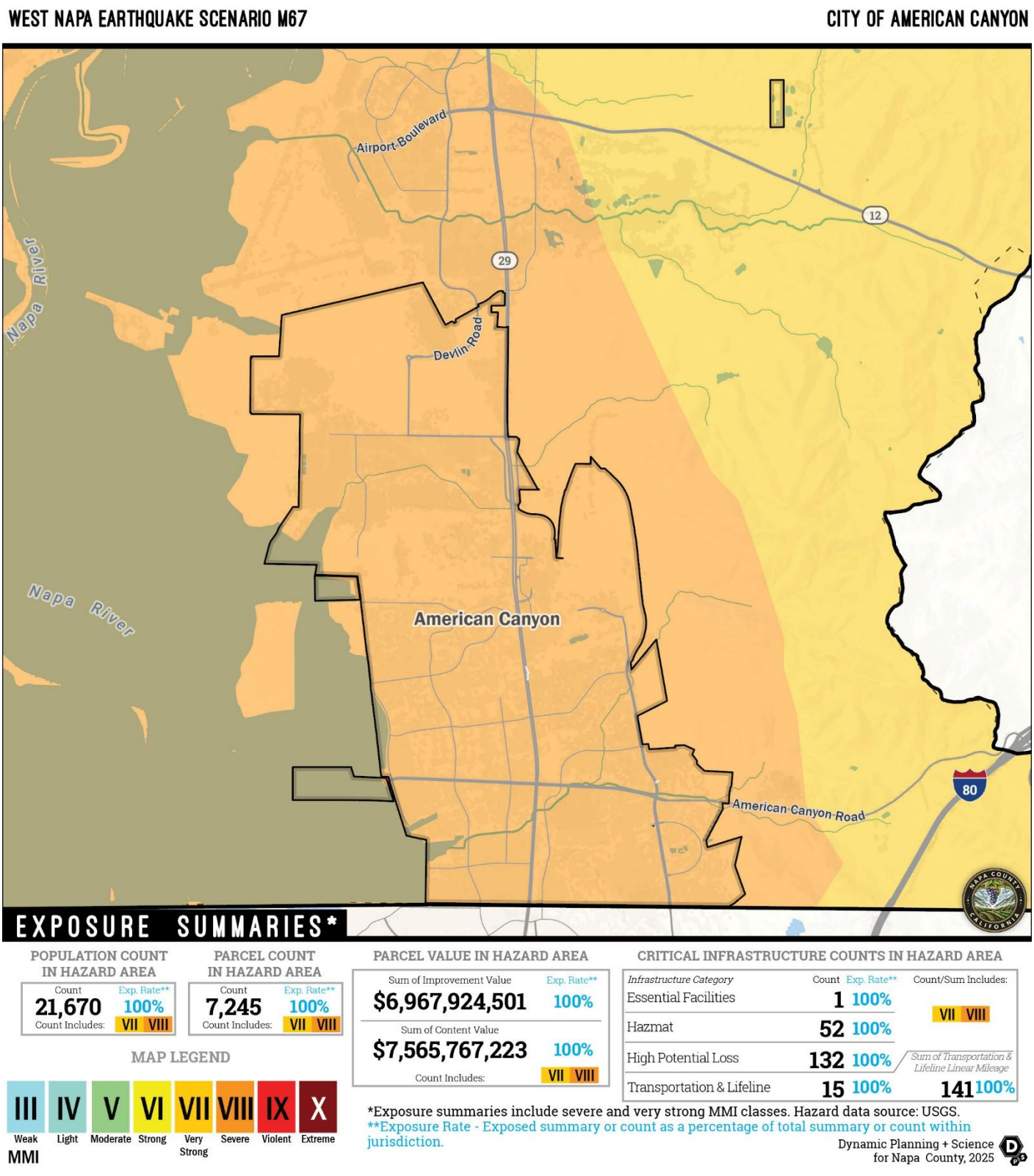


Figure 1-18: Exposure Summary – City of American Canyon Earthquake Risk (M6.7 West Napa)

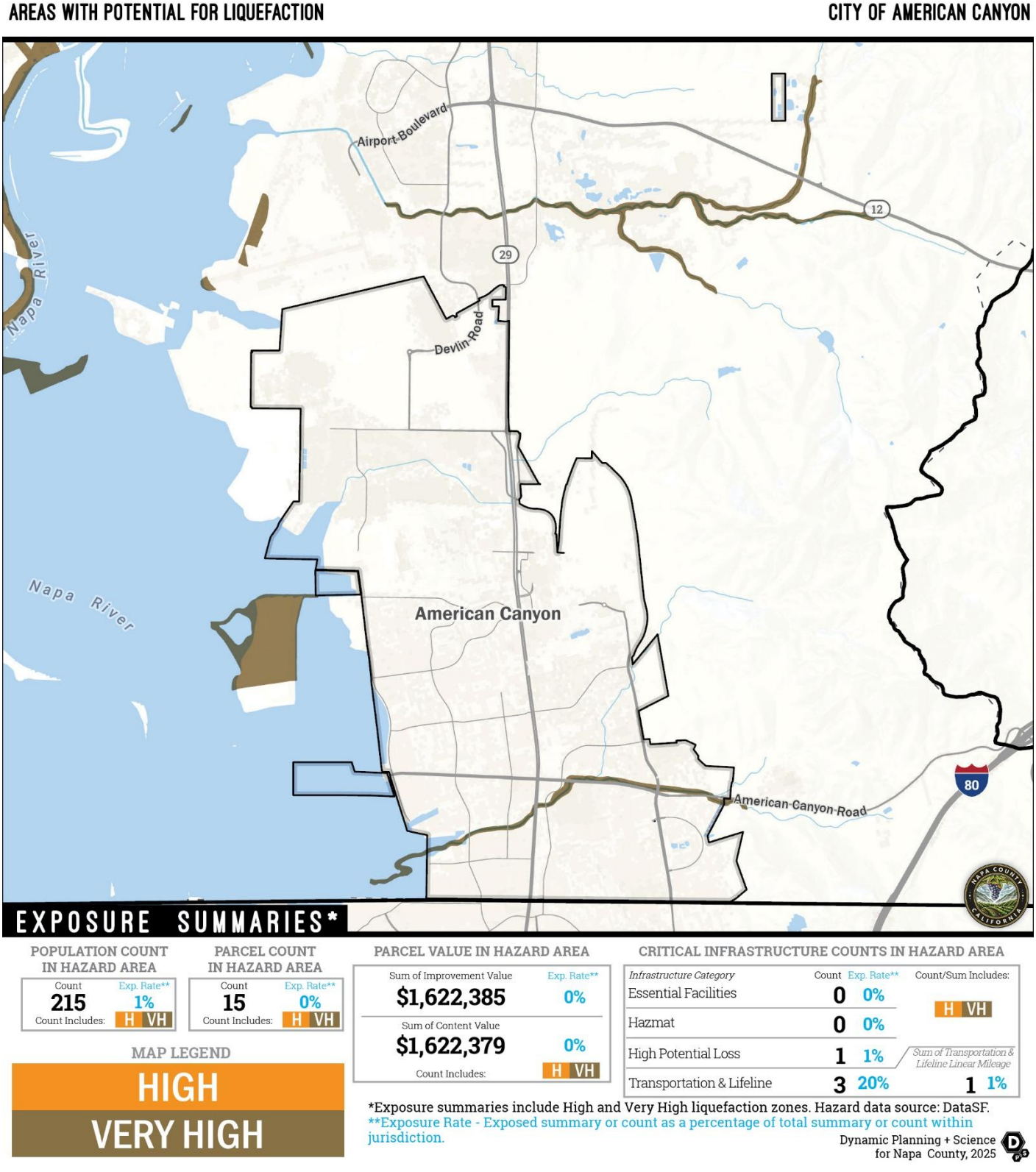


Figure 1-19: City of American Canyon Liquefaction Risk

1.5.2.5 Slope Failure Hazard

Slope failure, including landslides, debris flows, and earth movement, poses a localized but notable hazard for the City of American Canyon due to the presence of steep terrain along the eastern edge of the city and surrounding foothills. Areas of higher landslide susceptibility are primarily located in the hillside and upland regions east of developed neighborhoods, where steeper slopes, weathered soils, and drainage features increase the likelihood of slope instability.

The Landslide Risk Exposure map, Figure 1-20, based on data from the California Geological Survey, identifies areas of low, moderate, and high landslide susceptibility. High-susceptibility areas are concentrated outside the City's urban core, particularly in undeveloped or sparsely developed hillside terrain. These areas are more prone to slope failure during periods of prolonged or intense rainfall, which can saturate soil and reduce slope stability.

Exposure analysis indicates that slope failure risk affects a relatively small portion of American Canyon's developed areas. Approximately 90 residents and 6 parcels are located within mapped high-susceptibility zones, with an estimated $8.3 million in building improvement and contents value exposed. No essential facilities, hazardous materials sites, high potential loss facilities, or major transportation and lifeline infrastructure are located within high-risk slope failure areas, limiting the potential for widespread community impacts.

Although overall exposure is limited, slope failure events can still result in localized damage to structures, roadways, and utilities, particularly where development occurs near steep slopes or drainage channels. Landslides may also block access routes, disrupt emergency response, and increase sediment loads in downstream waterways. In addition, slope instability can be triggered or exacerbated by earthquake shaking, compounding risks during major seismic events.

Climate change may increase slope failure risk over time by contributing to more intense storm events and longer periods of soil saturation. Hillside areas east of American Canyon may experience increased erosion and slope movement under these conditions, emphasizing the importance of proactive planning and monitoring.

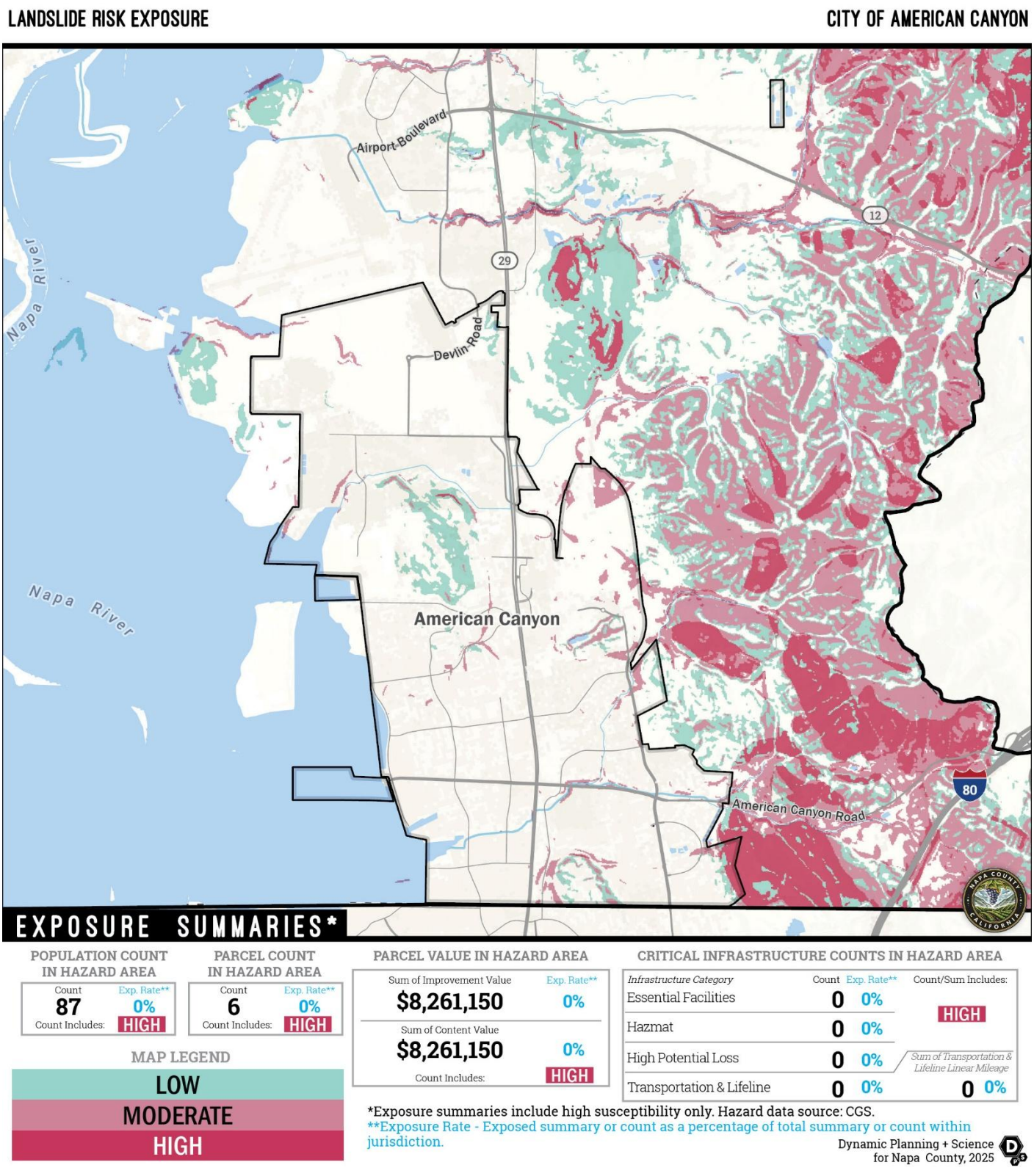


Figure 1-20: Exposure Summary – City of American Canyon Slope Failure Risk

1.5.2.6 Drought Hazard

The National Drought Monitor provides drought data and maps nationally and on a localized, watershed scale. The National Drought Monitor is the product of 11 agencies, including the NDMC, NOAA and USDA, and is available at http://droughtmonitor.unl.edu/. The National Drought Monitor categorizes the level of drought from D0 through D4, with D4 being the highest "exceptional drought." Table 1-13 depicts drought classifications and impacts from the level of drought occurrence in California, while Figure 1-21 shows a time series of the level of drought in Napa County from 2000 to 2026 according to the National Drought Monitor.

Drought is a recurring and long-term hazard for the City of American Canyon due to California's Mediterranean climate, variable precipitation patterns, and increasing impacts from climate change. Periods of prolonged below-average rainfall, reduced snowpack in the Sierra Nevada, and higher temperatures can significantly affect regional water supplies, ecosystems, and community resilience. Although drought does not typically cause immediate physical damage like other hazards, its cumulative impacts can be widespread and long-lasting.

American Canyon relies on a combination of surface water and imported water supplies that are vulnerable to regional drought conditions. Extended drought periods can reduce available water supplies, increase demand during hotter and drier conditions, and place stress on water delivery systems. Drought conditions may also require implementation of mandatory water conservation measures, affecting residents, businesses, landscaping, and industrial operations.

Drought can exacerbate other natural hazards affecting American Canyon. Dry conditions increase vegetation stress and fuel loads, elevating wildfire risk in surrounding grasslands and open space areas. Reduced soil moisture can also contribute to land subsidence, soil instability, and increased erosion during subsequent storm events. In addition, drought can degrade wetlands and riparian habitats along the Napa River and bayfront, reducing their natural flood attenuation and ecological functions.

Economic impacts of drought may include increased operational costs for businesses, reduced agricultural productivity in the surrounding region, and higher household expenses related to water use restrictions or rate adjustments. Vulnerable populations, including low-income households and elderly residents, may be disproportionately affected by higher utility costs and reduced access to cooling and water resources during extreme heat events associated with drought.

Climate change projections indicate that drought conditions in California are likely to become more frequent and severe, with longer dry periods punctuated by fewer but more intense storm events. These trends increase uncertainty in water supply reliability and place additional importance on long-term water resource planning, conservation, and resilience measures.

Table 1-13: Drought Classifications and Impacts

Category	Description	Possible Impacts
D0	Abnormally Dry	▪ Soil is dry; irrigation delivery begins early ▪ Dryland crop germination is stunted ▪ Active fire season begins
D1	Moderate Drought	▪ Dryland pasture growth is stunted; producers give supplemental feed to cattle ▪ Landscaping and gardens need irrigation earlier; wildlife patterns begin to change ▪ Stock ponds and creeks are lower than usual
D2	Severe Drought	▪ Producers increase water efficiency methods and drought-resistant crops ▪ Grazing land inadequate ▪ Fire season is longer, with high burn intensity, dry fuels, and large fire spatial extent, more fire crews on staff ▪ Lake- and river-based tourism declines; boat ramps close ▪ Trees are stressed; plants increase reproductive mechanisms; wildlife diseases increase ▪ Water temperatures increase; programs to divert water to protect fish begin ▪ River flows decrease; reservoir levels are low and banks are exposed
D3	Extreme Drought	▪ Federal water is not adequate to meet irrigation contracts; extracting supplemental groundwater is expensive ▪ Fire season lasts year-round; fires occur in typically wet parts of the state; burn bans are implemented ▪ Ski and rafting business are low; mountain communities suffer ▪ Low water levels impede fish migration and cause lower survival rates ▪ Wildlife encroaches on developed areas; little native food and water is available for bears, which hibernate less ▪ Water sanitation is a concern; reservoir levels drop significantly; surface water is nearly dry; flows are very low; water theft occurs ▪ Livestock need supplemental feed, cattle and horses are sold; little pasture remains ▪ Well and aquifer levels decrease; homeowners drill new wells
D4	Exceptional Drought	▪ Fire season is very costly; number of fires and areas burned are extensive ▪ Many recreational activities are affected ▪ Fields are left fallow; orchards are removed; vegetable yields are low; honey harvest is small; agricultural unemployment is high, food aid is needed ▪ Fish rescue and relocation begin; pine beetle infestation occurs; forest mortality is high; wetlands dry up; wildlife death is widespread; algae blooms appear ▪ Poor air quality affects health: greenhouse gas emissions increase as hydropower production decreases; West Nile outbreaks rise ▪ Water shortages are widespread; surface water is depleted; federal irrigation water deliveries are curtailed; water prices are extremely high; wells are dry, more and deeper wells are drilled; water quality is poor

Source: Adapted from U.S. Drought Monitor Drought Classifications and Impacts

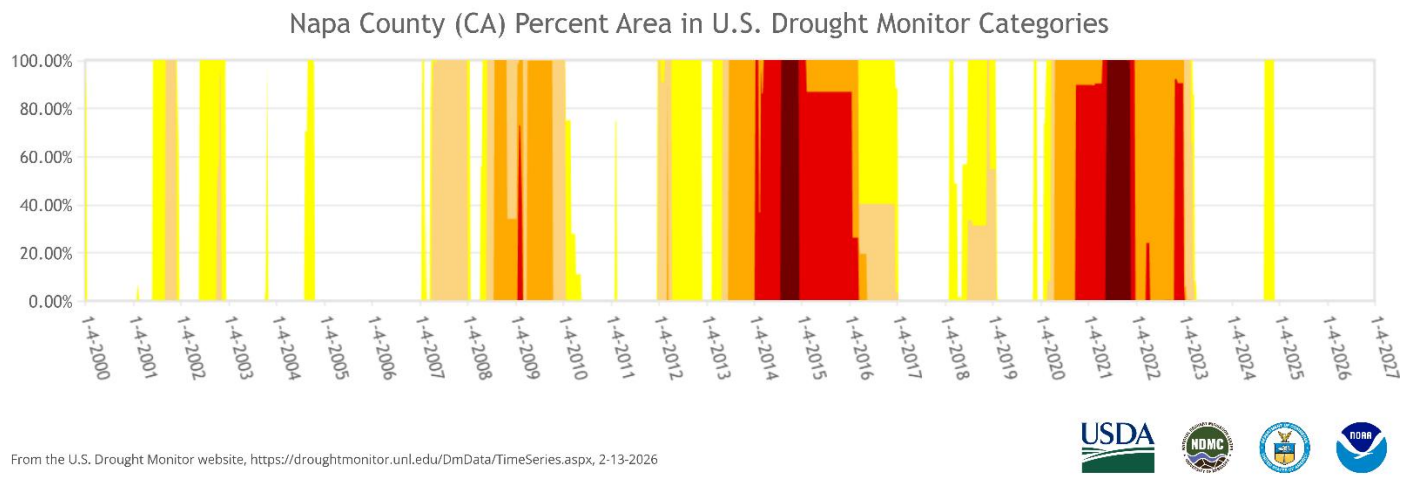


Figure 1-21: Drought Severity Timeline 2000-2026

1.5.2.7 Severe Weather Hazard

Severe weather in the City of American Canyon is primarily associated with winter storm events, which can bring periods of heavy rainfall, localized flooding, and stormwater system impacts. The city is located in the southern portion of Napa County, where topography is generally flatter and less constrained than the northern valley and mountainous regions. As a result, while flooding can occur during intense rain events, the severity and extent of flooding is typically less pronounced than in the northern portions of Napa County, where steeper terrain and larger watersheds contribute to more significant flood hazards.

Heavy rainfall during winter months can lead to localized ponding, urban flooding, and increased runoff, particularly in low-lying areas, along roadways, and in areas with limited drainage capacity. Stormwater systems may become overwhelmed during high-intensity rainfall events, resulting in temporary street flooding and impacts to transportation. In addition, creeks and drainage channels within and near the city may experience elevated flows, which can contribute to localized flooding in adjacent areas.

Severe weather events may also produce secondary impacts, including debris accumulation in drainage systems, minor erosion, and disruption to transportation and daily activities. High winds associated with winter storms may result in downed trees or power outages, although these impacts are generally localized. Compared to wildfire hazards, severe weather events in American Canyon tend to be short-duration and less destructive, but they can still affect infrastructure, mobility, and public safety.

Future climate conditions may influence the frequency and intensity of winter storm events, with projections indicating the potential for more intense rainfall over shorter durations, which could increase the likelihood of localized flooding. Continued maintenance of stormwater infrastructure, flood control systems, and drainage channels will be important to managing these risks.

1.5.2.8 Extreme Heat Hazard

The City of American Canyon's climate is influenced by its location within the Napa Valley and proximity to San Pablo Bay, which typically provides some moderation of temperature extremes. However, despite this marine influence, the City is increasingly experiencing periods of elevated temperatures, particularly during late summer and early fall when offshore flow conditions reduce coastal cooling effects. In recent decades, Napa has seen an increase in the frequency, duration, and intensity of extreme heat events, a trend that is expected to continue under changing climate conditions.

Historical & Regional Context

Although American Canyon has historically experienced a Mediterranean climate characterized by warm, dry summers and mild coastal influence, recent regional heat waves have demonstrated the city's growing vulnerability to extreme heat. Statewide events, including those in 2017 and 2020, resulted in prolonged periods of high temperatures across inland portions of the Bay Area, including Napa Valley. During these events, temperatures in Napa exceeded typical seasonal norms and, in some cases, approached or exceeded 100°F for multiple consecutive days.

Napa's valley setting contributes to heat retention, particularly during periods of high pressure and low wind, when warm air becomes trapped and nighttime cooling is limited. These conditions can result in extended heat events that persist over several days, increasing cumulative stress on residents, infrastructure, and natural systems. Unlike areas immediately adjacent to the bay, portions of Napa experience more pronounced temperature extremes due to reduced marine influence and localized topographic effects.

Climate projections indicate that the city is likely to experience a substantial increase in both the number of extreme heat days and warm nights over time. Extreme heat days, defined as those exceeding historically high temperature thresholds, are expected to become more frequent, while warm nights will reduce opportunities for overnight cooling, compounding heat-related stress on vulnerable populations.

According to the Cal-Adapt extreme heat days and warm nights tool using a medium emissions scenario (RCP 4.5), the City of American Canyon will likely experience a climate change-driven increase in extreme heat days from two days per year to 17 days per year by the end of the century. Over the same time period, the city is also likely to see an increase in warm nights from four days per year to 46 days per year Table 1-14 explains the extreme heat event thresholds for the City of American Canyon.

Table 1-14: Cal-Adapt Extreme Heat Thresholds

Term	Cal-Adapt Definition	Thresholds for City of American Canyon
Extreme Heat Day	Defined as a day in a year when the daily maximum/minimum temperature exceeds the 98th percentile of daily maximum/minimum temperatures based on observed historical data from 1961-1990 between April and October.	**99.2°F**
Warm Night	Defined as a day in April through October when daily minimum temperature exceeds the 98th historical percentile of daily minimum temperatures, based on observed data from 1961-1990 between April and October.	**60.2°F**
Heat Wave	Defined as four consecutive days or nights above the extreme heat / warm night threshold.	**3 days ≥ 99.2°F** or **4 nights ≥ 60.2°F**

Source: Cal-Adapt Extreme Heat Days and Warm Nights Tool

Impacts on Residents & Infrastructure

Extreme heat hazards impact American Canyon in several ways. Public health risks are the most immediate concern, with vulnerable populations such as seniors, young children, outdoor workers, medically fragile residents, and mobile home communities at elevated risk of heat-related illnesses. The city's demographics, particularly its older adult population and concentration of seniors with disabilities, increase sensitivity to prolonged high temperatures.

From an infrastructure perspective, heat waves stress the power grid, raising the likelihood of blackouts that can leave residents without cooling options. Prolonged extreme heat can also damage roads, rail, and utilities, as well as strain HVAC systems in schools, businesses, and critical facilities. Parks, athletic fields, and outdoor programs may face closures due to unsafe conditions, impacting community services and recreation.

Cascading Effects

Extreme heat can contribute to and exacerbate other hazards within the City of American Canyon. Prolonged high temperatures dry vegetation and increase wildfire risk in surrounding areas, while also contributing to degraded air quality, particularly during regional wildfire events. Heat can also intensify drought conditions by increasing evaporation rates and water demand, placing additional stress on local water resources.

Social and economic impacts are also associated with extreme heat. Households with limited financial resources may face challenges in maintaining adequate cooling or absorbing increased utility costs during prolonged heat events. These factors can contribute to disproportionate impacts on vulnerable populations and increase the need for targeted outreach and support.

1.5.2.9 Climate Change Hazard

Average annual temperatures across most of California have already increased by more than 1°F, with some areas experiencing rises of over 2°F when comparing the 1901 to 1960 average to that of 1986 to 2016. Daily maximum temperatures—a key indicator of extreme heat—are projected to increase by 4.4°F to 5.8°F by 2050 and by 5.6°F to 8.8°F by 2100. Heat waves that impact public health, known as heat-health events, are also expected to intensify across the state. By 2050, these events are projected to last up to two weeks longer in the Central Valley and occur four to ten times more often in the Northern Sierra region (California Natural Resources Agency, 2022).

California is already experiencing significant impacts from climate change, including prolonged drought, a lengthened wildfire season, increased coastal flooding and erosion, and widespread tree mortality. The state has observed rising average temperatures, more extreme heat days, fewer cold nights, a longer growing season, and shifts in the water cycle, with less winter precipitation falling as snow. In addition, summertime fog has declined by approximately 33%, and both snowmelt and rainwater runoff are occurring earlier in the year (Cal OES, 2018).

Long-term trends indicate a 12% to 20% decline in fog across California from 1900 through projections to 2070. Climate experts suggest that warming temperatures reduce the ability of air masses to cool enough to produce fog, which plays a critical role in supporting California's ecosystems (Grantham, Teodore; University of California, Berkeley, 2018).

The City of American Canyon is increasingly vulnerable to the long-term impacts of climate change, which function as hazard multipliers across the Napa Valley and broader North Bay region. American Canyon's location close proximity to San Pablo Bay and surrounding upland areas, creates a complex climate setting that is sensitive to shifts in temperature, precipitation patterns, and seasonal variability. Projected changes in these conditions are expected to intensify existing hazards, including flooding, drought, extreme heat, wildfire, and slope instability.

American Canyon's location near the Napa River and San Pablo Bay influences its local climate, though it still experiences periods of elevated temperatures during regional heat events. While marine influences can moderate temperatures at times, these effects may be reduced during offshore wind conditions or prolonged high-pressure systems, allowing heat to build across the area. As temperatures continue to rise, the frequency and duration of extreme heat events are expected to increase, placing additional stress on vulnerable populations such as older adults, children, outdoor workers, and residents without access to adequate cooling. Increased heat also drives higher energy demand, placing strain on the electrical grid and increasing the likelihood of service disruptions.

Sea Level Rise

The City of American Canyon is located at the southern end of Napa County adjacent to the Napa River and the San Pablo Bay shoreline, making it one of the few jurisdictions in the County directly exposed to sea level rise and tidal flooding hazards. Although much of Napa County is inland and not affected by coastal

processes, American Canyon's proximity to the Bay places portions of the city at risk from rising sea levels, storm surge, and changes in tidal dynamics.

Sea level rise can lead to increased frequency and extent of tidal flooding, particularly in low-lying areas near the Napa River, wetlands, and shoreline zones. Areas that currently experience occasional flooding during high tides or storm events may be inundated more frequently as sea levels rise. In addition, higher baseline water levels can reduce the capacity of drainage systems to discharge stormwater, potentially leading to compound flooding during periods of heavy rainfall combined with high tides.

Critical infrastructure located near the Bay and river corridors may also be vulnerable to sea level rise. This includes transportation corridors, stormwater systems, wastewater infrastructure, and utilities, which may be affected by periodic inundation, corrosion, or reduced functionality over time. Wetlands and natural shoreline features may provide some buffering capacity, but they may also be impacted by rising water levels and changes in sediment dynamics.

Sea level rise may also contribute to secondary impacts, including saltwater intrusion into groundwater or soils, degradation of habitats, and increased maintenance needs for levees and shoreline protection systems. In areas where development is located near the shoreline or along tidal waterways, long-term exposure to rising water levels may affect land use, infrastructure planning, and property values.

Climate change projections for the San Francisco Bay Area indicate that sea levels are expected to continue rising over the coming decades, increasing the likelihood of both chronic tidal flooding and more severe impacts during storm events. As a result, the City of American Canyon may face increasing pressure to plan for adaptation strategies, including improvements to flood protection infrastructure, enhancement of natural buffers such as wetlands, and integration of sea level rise considerations into future development and capital improvement planning.

Drought & Water Reliability

Climate change is expected to result in more frequent and prolonged drought conditions across Napa County. While the City of American Canyon benefits from a combination of local and regional water sources, extended dry periods can reduce water availability, increase demand, and place stress on both surface water and groundwater systems. Reduced precipitation and earlier snowmelt in upstream watersheds may affect reservoir storage and seasonal water supply reliability.

Drought conditions also have broader environmental and hazard implications. Reduced soil moisture and vegetation stress increase susceptibility to wildfire in surrounding areas, while also affecting urban landscaping and tree canopy health within the city. Prolonged dry conditions may also impact local creeks and riparian systems, which play an important role in stormwater conveyance, habitat, and groundwater recharge.

Precipitation, Storms & Flooding

Although total annual precipitation may not significantly increase, climate projections indicate that rainfall is more likely to occur in fewer, more intense storm events. These high-intensity storms, often associated with atmospheric river systems, increase the risk of riverine flooding along the Napa River as well as localized flooding in urban areas with constrained drainage systems.

Intense rainfall following extended dry periods can also increase the risk of erosion, localized slope instability, and debris flows, particularly in eastern hillside areas of American Canyon and along transportation corridors. These conditions can impact critical infrastructure, damage roadways, and disrupt emergency access. In addition, higher peak flows in the Napa River and its tributaries may exceed existing system capacity during extreme events, contributing to flooding beyond currently mapped floodplain boundaries.

Wildfire & Vegetation Change

Climate-driven increases in temperature and changes in precipitation patterns are expected to extend the wildfire season and increase fire risk in areas surrounding the City of American Canyon. While much of the city is urbanized, it is bordered by wildland/grassland and open space areas that are susceptible to wildfire. Fires in surrounding areas can affect the city through evacuation impacts, degraded air quality, and strain on emergency services.

Changes in vegetation patterns, including increased tree mortality and shifts in species composition, may contribute to higher fuel loads over time. Even when wildfire does not directly impact the city, smoke and poor air quality can have significant public health consequences, particularly for sensitive populations.

Cascading Effects

Climate change amplifies interactions between hazards, creating compounding risks for the City of American Canyon. Extreme heat can worsen drought conditions and increase wildfire potential, while drought-stressed landscapes are more susceptible to erosion during intense storm events. Severe storms may damage infrastructure already stressed by heat or aging conditions, while flooding can disrupt transportation and utility systems needed for emergency response.

These cascading effects underscore the importance of integrating climate considerations into hazard mitigation planning, infrastructure investment, emergency preparedness, and community outreach. As climate conditions continue to evolve, proactive planning will be critical to reducing long-term risk and enhancing community resilience.

1.5.3 Climate Change Impacts & Vulnerable Populations

Climate change is expected to exacerbate many of the natural hazards affecting the City of American Canyon, increasing risks to populations that already face social, economic, or physical vulnerabilities. Rising temperatures, more extreme precipitation events, prolonged drought, sea level rise, and increased

frequency of extreme heat are projected to intensify existing hazard conditions and create new challenges for public health, safety, and emergency response.

Certain populations in American Canyon are more likely to experience disproportionate impacts from climate-related hazards. Older adults, individuals with disabilities, low-income households, renters, and households with limited English proficiency may have reduced capacity to prepare for, respond to, and recover from climate-driven events. These groups may face barriers related to mobility, access to transportation, financial resources, housing stability, or timely access to emergency information.

Extreme heat presents a growing risk to vulnerable populations, particularly elderly residents, individuals with underlying health conditions, outdoor workers, and households without adequate cooling. Heat waves can increase the incidence of heat-related illness, strain electrical systems, and worsen air quality, especially when combined with wildfire smoke. Low-income households may be less able to afford cooling costs or make energy-efficient upgrades, increasing exposure during prolonged heat events.

Flooding and sea level rise disproportionately affect residents and workers in low-lying areas near the Napa River and bayfront. Vulnerable populations living or working in these areas may face greater risk of displacement, property damage, and disruption of access to essential services. Flood events can also impact transportation routes and utilities, creating additional challenges for individuals who rely on public transit, medical equipment, or nearby services.

Drought and water scarcity can place added burdens on vulnerable populations by increasing utility costs, limiting access to cooling and landscaping, and reducing the resilience of natural systems that provide flood protection and cooling benefits. For low-income households and fixed-income seniors, increased water and energy costs associated with drought and heat can compound financial stress.

Climate change may also increase the frequency and duration of poor air quality events, particularly from regional wildfires. Individuals with respiratory conditions, older adults, children, and outdoor workers are especially sensitive to smoke exposure. Limited access to air filtration, clean indoor environments, or protective equipment can further increase health risks for vulnerable populations.

1.5.4 Hazard Problem Statements

As part of the mitigation action identification process, the Planning Committee for each jurisdiction identified areas of concern (aka problem statements) for their respective facilities based on the risk assessment and vulnerability analysis, utilizing the RAMP mapping and static snapshot maps. Problem statements focused on the impact, victim, or threat that the hazard could create in the jurisdiction, as described in Table 1-15. Identifying common issues and weaknesses through these problem statements assisted the planning group in understanding the realm of resources needed for mitigation.

The goal is to have at least one mitigation action for every problem statement. Projects or actions have been developed to mitigate each problem identified. See Table 1-17 for a full list of mitigation actions and

corresponding problem statements that they address. Each problem statement is coded with a problem number for cross-referencing between Table 1-15 and Table 1-17

Table 1-15: City of American Canyon Hazard Problem Statements

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-CC-AC-16	Climate Change	Threat	**City of American Canyon**	Sea level rise threatens American Canyon's critical shoreline facilities, including WWTP, Public Works Yard, pump stations, and Wetlands Edge Road, by increasing flood frequency, storm surge impacts, and infrastructure corrosion risk.	ma-CC-AC-10
ps-CC-AC-307	Climate Change	Threat	**City of American Canyon**	Climate change is expected to increase the severity of extreme heat, drought, severe weather, and flooding, exacerbating hazard impacts on vulnerable populations and critical infrastructure.	ma-DR-AC-20
ps-DF-AC-32	Dam Failure	Victim	**City of American Canyon**	Over 2,000 residents, more than 500 parcels, and several critical facilities are located within dam inundation zones associated with Berryessa/Monticello, Napa Dam, Rector Creek, and Chabot Dam, placing significant downstream populations at life-safety risk.	ma-FL-AC-47, ma-FL-NCo-55, ma-FL-NCo-56, ma-DF-NCo-120, ma-DF-AC-215
ps-DF-AC-33	Dam Failure	Threat	**City of American Canyon**	Key access routes and major utility infrastructure in American Canyon lie within dam inundation areas, creating the threat of road closures, service disruption, and potential delays in emergency response during a dam failure event.	ma-FL-AC-47, ma-FL-NCo-55, ma-FL-NCo-56, ma-DF-NCo-120, ma-DF-AC-215
ps-DR-AC-42	Drought	Threat	**City of American Canyon**	American Canyon relies almost entirely on imported State Water Project supplies, which fluctuate based on statewide hydrological conditions. Increasing drought frequency threatens water reliability, cost stability, and the City's long-term resilience.	ma-DR-AC-20, ma-DR-NCo-24
ps-DR-AC-308	Drought	Victim	**City of American Canyon**	Drought impacts disproportionately affect seniors, low-income households, and renters who have limited control over water usage and face heightened financial burdens during drought surcharges or mandatory restrictions.	ma-DR-AC-20
ps-EQ-AC-69	Earthquake	Victim	**City of American Canyon**	All residents in American Canyon live in severe shaking zones associated with a West Napa Fault event, with renters, mobile home residents, and seniors facing disproportionate vulnerability.	ma-EQ-AC-32
ps-EQ-AC-70	Earthquake	Victim	**City of American Canyon**	More than 7,000 parcels, 200 critical facilities, and nearly $7 billion in property value are located in severe shaking zones, risking widespread structural damage and extended service outages.	ma-EQ-AC-32, ma-EQ-AC-33

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-EQ-AC-79	Earthquake	Threat	**City of American Canyon**	American Canyon's water distribution system, gas pipelines, and other underground utilities are highly susceptible to rupture and service failure during a major earthquake, increasing the risk of fires, contamination, and extended outages.	ma-EQ-AC-33
ps-FL-AC-120	Flood	Victim	**City of American Canyon**	Flooding along the Napa River and American Canyon Creek can impact more than 1,600 residents in the 100- and 500-YR floodplains, including multiple mobile home parks, with tidal influence exacerbating flood depths and drainage challenges.	ma-FL-AC-47, ma-FL-AC-47, ma-CC-AC-10, ma-FL-AC-46
ps-FL-AC-122	Flood	Impact	**City of American Canyon**	Aging storm drainage systems and known culvert backup locations create recurring flood hazards during heavy rainfall and atmospheric river events, especially when combined with high tides.	ma-FL-AC-46, ma-CC-AC-10
ps-FL-AC-123	Flood	Victim	**City of American Canyon**	Flooding threatens multiple critical infrastructure facilities and can disrupt road access, stormwater conveyance, and community lifelines due to culvert backups and tidal surge interactions.	ma-FL-AC-47, ma-CC-AC-10
ps-HH-AC-310	High Heat	Impact	**City of American Canyon**	Extreme heat often triggers PSPS events or power outages from high demand during peak times.	ma-HH-AC-216
ps-HH-AC-311	High Heat	Victim	**City of American Canyon**	Extreme heat events place seniors, medically vulnerable residents, outdoor workers, and low-income households at elevated risk of heat-related illness.	ma-HH-AC-216
ps-HH-AC-312	High Heat	Threat	**City of American Canyon**	The number of extreme heat days and warm nights and duration of heat waves is anticipated to increase with climate change.	ma-HH-AC-216
ps-HH-AC-313	High Heat	Threat	**City of American Canyon**	The city lacks back-up power for many cooling centers, limiting shelter options and capacity during heat events.	ma-HH-AC-216
ps-SW-AC-143	Severe Weather	Impact	**City of American Canyon**	Severe winter storms and heavy rain events cause roadway flooding, downed trees, power outages, and PSPS-related disruptions, affecting mobility, safety, and essential services throughout the city.	ma-SW-NCo-81, ma-SW-NCo-82, ma-SW-AC-121, ma-SW-AC-214
ps-SW-AC-309	Severe Weather	Victim	**City of American Canyon**	Medically dependent residents, seniors, and households without backup power are disproportionately impacted by outages during severe storms, including high wind, PSPS events, and flooding from heavy rain.	ma-SW-AC-121, ma-SW-AC-214
ps-SF-AC-314	Slope Failure	Impact	**City of American Canyon**	Slides, erosion, and other slope failures can block roads and damage recreational trails, limiting use and often cutting off access for maintenance (e.g., for PG&E).	ma-SF-AC-217
ps-SF-AC-315	Slope Failure	Victim	**City of American Canyon**	Slope failures can negatively impact water quality and cut off access for ranchers and can reduce recreation options for trail users.	ma-SF-AC-217

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-SF-AC-316	Slope Failure	Threat	**City of American Canyon**	Heavy rain and earthquake events can trigger major slope failures in the hilly areas in and around the city.	ma-SF-AC-217
ps-WF-AC-173	Wildfire	Victim	**City of American Canyon**	Residents living in moderate to high wildfire intensity zones remain at risk, and vulnerable populations like seniors and those without personal vehicles may face challenges evacuating during fast-moving fires.	ma-WF-AC-86, ma-WF-NCo-90
ps-WF-AC-174	Wildfire	Threat	**City of American Canyon**	Critical facilities, utility corridors, and hillside vegetation create the threat of rapid wildfire spread toward populated areas, particularly in areas lacking defensible space or redundant access routes.	ma-WF-AC-86
ps-WF-AC-175	Wildfire	Impact	**City of American Canyon**	Legacy High School and the Water Treatment Plant are located in high wildfire intensity zones, where smoke, embers, and fire spread can disrupt education, water treatment operations, and air quality.	ma-WF-AC-86

1.6 Mitigation Strategy

This section provides the framework for how the City of American Canyon will reduce hazard risk within its jurisdiction while supporting the broader goals of the Napa County MJHMP. It includes an overview of existing capabilities, opportunities to strengthen resilience, and the city's prioritized mitigation actions. Together, these elements demonstrate how American Canyon integrates hazard awareness into its planning and development processes while contributing to a coordinated countywide approach.

Within the Napa County MJHMP, the mitigation strategy serves as the roadmap for future hazard mitigation efforts. For American Canyon, the strategy outlined in this annex reflects the outcomes of the countywide planning process while also addressing the city's unique risks, priorities, and community needs. The strategy is designed to reduce vulnerabilities identified in the risk assessment, including the problem statements developed for flooding, earthquakes and liquefaction, slope failure, wildfire, drought, severe storms, extreme heat, and climate change.

Mitigation actions identified in this annex include both policy-based and project-based initiatives, with an emphasis on integrating resilience into land use planning, infrastructure investments, and community programs. Actions are structured to align with FEMA's requirements and to coordinate with existing city, county, and regional planning mechanisms. Each action identifies responsible parties, potential funding sources, and the resources needed for implementation.

For American Canyon, this strategy provides a framework for strengthening resilience by combining city-led initiatives, such as infrastructure improvements, building code enforcement, and community preparedness, with regional coordination through the MJHMP. By advancing these efforts in alignment with the General Plan and other local planning documents, American Canyon enhances its ability to reduce hazard risk while supporting long-term community safety, sustainability, and economic stability.

The subsections that follow describe these elements in detail:

- **Sections 1.6.1, Capabilities and Opportunities,** provides a summary of the city's capacity to address natural hazards.
- **Section 1.6.2, Mitigation Action Plan,** presents American Canyon's prioritized actions to guide implementation in coordination with countywide strategies.
- **Section 1.6.3, Status of Previous Mitigation Actions,** provides a summary of all previous actions and their current status, whether completed, cancelled, or revised.

Aligning the Action Plan

This section connects American Canyon's mitigation actions with its existing capabilities and areas for growth. Capability assessments are a required element of hazard mitigation planning under the Disaster Mitigation Act of 2000 and FEMA's 2023 guidance, ensuring that actions are realistic, achievable, and aligned with available resources.

The section begins with a summary of American Canyon's capabilities across four areas: planning and regulatory, administrative and technical, fiscal, and education and outreach. This overview highlights the tools and strengths that the district already uses to reduce hazard risk. The section then provides a detailed analysis of each capability area, identifying both current practices and opportunities to expand resilience.

1.6.1 Capabilities & Opportunities

This section provides a detailed assessment of the city's current capabilities to support hazard mitigation, as well as future opportunities. This consists of describing how the city is planning for hazards and growth and a summary of its existing capabilities and the potential for enhancement.

1.6.1.1 Planning for Hazards & Growth

As a general law city, the City of American Canyon manages growth within the framework of California's comprehensive planning, zoning, subdivision, and environmental regulations. Much of the City's developable land has already been urbanized, and remaining growth is largely directed toward infill development, redevelopment, and planned buildout within the existing urban footprint. American Canyon is bordered by the Napa River and bayfront wetlands to the west and hillside terrain to the east, which constrains outward expansion and concentrates future development in areas already subject to natural hazards.

This development pattern places portions of the city's population, infrastructure, and economic assets within areas exposed to hazards such as riverine and tidal flooding along the Napa River, dam inundation zones, strong earthquake ground shaking and liquefaction, and extreme heat and drought conditions. Industrial and commercial areas near the river corridor and residential neighborhoods in low-lying areas are particularly sensitive to flooding and sea level rise, while hillside areas east of the city face localized risks related to slope instability and wildfire exposure.

Hazard vulnerability is addressed through coordination with the city's General Plan, particularly the Safety Element, which integrates hazard information into land use decisions, infrastructure planning, and development review. This approach ensures that growth and redevelopment consider site-specific risks and incorporate appropriate mitigation measures, such as flood-resilient design, geotechnical stabilization, and emergency access planning. Integration of hazard considerations into long-range planning also supports compliance with state and federal hazard mitigation requirements and strengthens the City's eligibility for disaster recovery and resilience funding.

Climate change is expected to intensify several of the hazards affecting American Canyon, including flooding influenced by sea level rise, more extreme precipitation events, prolonged drought, and increasing extreme heat. As growth continues within constrained and hazard-exposed areas, resilience must be embedded into every phase of planning and development. Growth management in American Canyon therefore emphasizes sustainable building practices, water conservation, protection of natural floodplain functions, and climate-adaptive infrastructure, ensuring that future development and redevelopment reduce, rather than exacerbate, existing hazard risks and support long-term community resilience.

Long-Range Planning & Growth Management

Long-range planning and growth management policies play a central role in limiting hazard exposure in American Canyon. The city's General Plan establishes the overall land use pattern, directs growth toward areas that can be safely and efficiently served by infrastructure, and discourages development in areas subject to significant natural hazards where feasible.

Growth in American Canyon has largely occurred within an established urban footprint, with an emphasis on infill development, redevelopment, and planned expansion areas that are supported by existing transportation, utility, and emergency services. This approach helps reduce the need for development in hazard-prone areas such as floodplains, steep slopes, and wildfire-prone wildland–urban interface locations. Where development does occur near hazard areas, planning policies emphasize hazard-aware site design, infrastructure resilience, and emergency access.

Long-range planning efforts also account for future climate conditions, recognizing that sea level rise, extreme heat, drought, and more intense storm events may alter hazard profiles over time. Incorporating these considerations into growth management helps ensure that future development does not increase vulnerability or place undue strain on emergency response and public services.

Building Codes & Development Standards

American Canyon's development strategies combine comprehensive planning frameworks with robust regulatory measures to guide growth while reducing risks from natural hazards. Building codes play a central role in this approach. Nationally, continual improvements to building codes since 1990 have added only about one percent to construction costs while greatly improving disaster resilience (National Institute of Building Sciences, 2019). In California, building codes are among the most stringent in the world, setting minimum standards that safeguard against hazards such as earthquakes, flooding, wildfire, landslides, and severe weather. American Canyon enforces these standards locally, providing a strong foundation for resilient construction.

The city is required to regularly update its development regulations to reflect the California Building Code (CBC), which is revised every three years and was most recently updated in 2025. The CBC establishes some of the world's highest construction standards, ensuring occupant safety in the face of natural hazards. Climate change is also addressed through adoption and updating of the California Green Building Standards (CALGreen) and Energy Codes, which integrate energy efficiency, sustainable design, and climate adaptation measures. In addition, American Canyon participates in the National Flood Insurance Program (NFIP), requiring that all new development in designated flood hazard areas meet FEMA's minimum flood protection standards.

Through these building and development regulations, American Canyon ensures that new development in hazard-prone areas is either restricted or subject to strict hazard-mitigation requirements. Where development is allowed, codes emphasize reducing exposure and vulnerability through appropriate siting, advanced construction techniques, emergency access, and defensible space. For example, new

construction in the wildland–urban interface (WUI) must comply with fire-resistant building materials and vegetation management requirements under the California Fire Code.

Beyond code enforcement, American Canyon integrates these mandates into broader local planning frameworks, including the General Plan and HMP This alignment ensures that growth management, environmental review, and hazard mitigation strategies collectively address emerging risks from wildfire, drought, flooding, extreme heat, and severe weather intensified by climate change.

California Environmental Quality Act (CEQA) & Hazard Mitigation

The California Environmental Quality Act (CEQA) requires General Plans, Specific Plans, and major development projects to evaluate hazards such as coastal flooding, bluff erosion, seismic risk, and wildfire. Environmental documents must identify these risks and propose mitigation measures, which may include setbacks from hazard-prone areas, infrastructure upgrades, evacuation planning, or restrictions on development in high-risk zones.

Regional and state public safety planning frameworks that inform development review in American Canyon include the State Seismic Hazards Mapping Act, the California Environmental Quality Act (CEQA) and its Guidelines, California Noise Insulation Standards (Title 24), and the Federal Emergency Management Agency (FEMA) Flood Insurance Program. Together, these programs establish requirements for evaluating and mitigating environmental and hazard-related impacts associated with development.

Under CEQA, residential projects that require discretionary approval from the city are subject to environmental review concurrently with the approval process. While CEQA review can add time to development and is therefore considered a potential constraint to housing production, much of American Canyon's remaining vacant and developable land has already undergone environmental review through Program Environmental Impact Reports (PEIRs) prepared as part of adopted specific plans. These PEIRs streamline subsequent project-level CEQA review by identifying environmental impacts and mitigation measures in advance, allowing later residential projects to tier from or rely on existing CEQA documents. Projects that deviate from the assumptions or scope of adopted specific plans may also tier from previously certified CEQA analyses, where appropriate.

Recent updates to CEQA standards have also changed how transportation and air quality impacts are evaluated. Transportation impacts are no longer assessed using Level of Service (LOS), which measured vehicle delay, but instead rely on Vehicle Miles Traveled (VMT) as the primary metric. This shift emphasizes reducing vehicle travel and associated emissions rather than roadway congestion.

In addition, updated Bay Area Air Quality Management District (BAAQMD) greenhouse gas (GHG) thresholds, adopted in April 2022, require changes to how GHG impacts are analyzed in CEQA documents. Under these standards, plans or projects within BAAQMD jurisdiction must either demonstrate consistency with an adopted, qualified local Climate Action Plan or incorporate specific project features, including all-electric buildings, a minimum reduction in VMT, and electric vehicle infrastructure meeting CalGreen Tier 2 requirements.

Although LOS is no longer used for CEQA compliance, the city continues to use LOS analysis as a non-CEQA planning tool to evaluate roadway operations, support infrastructure planning, and ensure that key transportation corridors function effectively and meet community expectations. Together, CEQA and related regulatory frameworks play a critical role in integrating hazard mitigation, climate adaptation, and sustainability considerations into development and long-range planning decisions in American Canyon.

By integrating hazard analysis into the development review process, CEQA helps ensure that future growth in American Canyon is designed with resilience and long-term community safety in mind.

1.6.1.2 Development & Hazard Considerations

Development in the City of American Canyon occurs within a physical and regulatory context shaped by natural hazards, environmental constraints, and long-term growth management policies. As a general law city operating under California planning and environmental regulations, American Canyon evaluates development proposals with consideration for hazard exposure, public safety, infrastructure capacity, and long-term resilience. This integrated approach helps ensure that new development and redevelopment do not increase risk to people, property, or critical systems.

Much of the city's remaining development potential lies within areas that are already urbanized or planned through adopted specific plans. As a result, development often occurs in proximity to known hazard areas, including floodplains along the Napa River, dam inundation zones, liquefaction-prone soils, and areas exposed to strong seismic shaking and extreme heat. Rather than avoiding development entirely in these locations, the city emphasizes risk-informed site planning, design, and construction standards to reduce vulnerability and limit potential impacts.

Flood hazards are addressed through enforcement of flood plain management regulations, participation in the National Flood Insurance Program, and incorporation of flood-resilient design measures for development in or near mapped flood hazard areas. These measures may include elevating structures, protecting utilities, maintaining flood conveyance, and avoiding critical facilities in the highest-risk locations. Development decisions also consider future flood conditions associated with sea level rise and more intense storm events.

Seismic hazards are a key consideration in development review due to the City's location within the seismically active San Francisco Bay Area. Projects are required to comply with state seismic design standards and, where appropriate, conduct site-specific geotechnical investigations to address ground shaking, liquefaction, and slope stability. These requirements help reduce structural damage and protect infrastructure during earthquake events.

Wildfire, slope failure, and extreme weather hazards are also considered during development review, particularly in areas near the eastern hills, open space, and transportation corridors. Development standards related to defensible space, access, drainage, and emergency response are used to minimize risk and support safe evacuation and emergency operations.

The CEQA provides a framework for identifying hazard-related impacts at the project level and requiring feasible mitigation measures. Through CEQA review, the city evaluates whether proposed development would expose people or structures to significant risks from natural hazards and ensures that appropriate avoidance, design, or mitigation measures are incorporated into project approvals.

1.6.1.3 Capabilities & Opportunities Assessment

To develop a realistic and actionable mitigation strategy, it must account for existing jurisdictional capabilities and what future opportunities there are to enhance those capabilities for purposes of hazard mitigation. This section provides an assessment of the City of American Canyon's existing capabilities and future opportunities, including planning and regulatory, administrative and technical, fiscal, and public outreach and education capabilities. This assessment also identifies opportunities to integrate this MJHMP into future planning, policies, or programs to weave mitigation efforts into daily operations and address hazard problems wholistically. Capabilities are categorized into four groups and include various mechanisms.

- **Planning and Regulatory Capabilities:** Existing long-range plans, emergency response plans, hazard-specific plans, land use policies, and building and development standards.
- **Administrative and Technical Capabilities:** Available expertise in emergency services, engineering, grant management, and community planning.
- **Fiscal Capabilities:** Budgetary capacity, taxing authority, grants, and other funding mechanisms that can support mitigation projects.
- **Outreach and Education Capabilities:** Existing programs for providing technical assistance, community education, public warnings, and stakeholder engagement.

A full description of the process used to develop the capabilities assessment is provided in Volume 1, Section 2.3.3.

This capabilities and opportunities assessment for American Canyon lists the various types of capabilities along with how they have been, currently are, or will in the future be integrated into hazard mitigation planning efforts. The three "HMP Integration" columns that identify the capability's status and usage are color-coded with green, yellow, or orange shading to communicate the following:

- **Status:** If the capability is present at all and what level of use it has generally.
- **Current Mitigation Use:** If the capability is currently being used in mitigation efforts, specifically, and at what level.
- **Future Opportunity:** If there is a future opportunity to integrate the capability into mitigation efforts and at what level.

Summary of Capabilities & Opportunities

This Capabilities and Opportunities Assessment for American Canyon summarizes the various types of capabilities it has for hazard mitigation currently. The assessment also identifies opportunities to integrate,

expand, and improve the city's capabilities for future hazard mitigation. Table 1-16 provides a comprehensive list of capabilities and identifies the current status, current mitigation use, and future opportunities.

Planning & Regulatory

The City of American Canyon has strong planning and regulatory capabilities that support hazard risk reduction and resilient development. The city enforces the California Building Code (Title 24) and locally adopted ordinances that address floodplain management, fire safety, stormwater control, water conservation, and development in inundation and hillside areas. These regulations are integrated into zoning, subdivision, and site plan review processes, ensuring that hazard considerations are addressed during development reviews.

Growth management is guided by policies in the city's General Plan, with updated hazard, climate change, and environmental justice policies being incorporated through the ongoing 2040 General Plan update. Capital investments are prioritized through the Capital Improvements Program (CIP), which supports resilient infrastructure for water, storm drainage, transportation, and public services.

American Canyon maintains several hazard reduction programs, including stormwater management and erosion control, water conservation, and public outreach through the ReadyAC emergency preparedness webpage. The city also promotes non-structural earthquake preparedness and household-level mitigation actions.

The city participates in the National Flood Insurance Program (NFIP) and enforces local floodplain management regulations supported by current FEMA flood mapping and elevation certificate records. While flood preparedness information is available, flood insurance education is limited, and the City does not currently participate in FEMA's Community Rating System (CRS), representing a future opportunity for enhanced flood risk reduction.

Future integration of the MJHMP will occur through various processes and mechanisms outlined across multiple mitigation actions (Table 1-17). Key opportunities for future hazard mitigation integration with the city's existing planning mechanisms include using the updated risk assessment, flood hazard data, and projected climate change impacts to inform implementation of the Flood Mitigation Support Program (ma-FL-AC-46), Flood Notification System Improvement (ma-FL-AC-47), and Stormwater Drainage Resilience Program (ma-SW-AC-121).

Administrative & Technical

The City of American Canyon has strong administrative and technical capacity to support hazard mitigation planning, implementation, and coordination. Core planning, engineering, and development review functions are housed within the Community Infrastructure and Development (CID) Department, including the Planning & Zoning, Public Works, and Building Divisions. These staff provide expertise in land use planning, development review, infrastructure design, and enforcement of building and safety standards.

The city has access to qualified personnel for key hazard mitigation functions, including community planning, land development review, construction engineering, natural hazards analysis, transportation planning, and resilience planning. The Building Division provides building code administration, and the City Manager serves as the Floodplain Administrator and Director of Emergency Services, ensuring direct coordination between planning, emergency management, and floodplain compliance. Fire prevention and wildfire mitigation functions are supported by the American Canyon Fire Protection District through the Fire Marshal.

While the City does not have dedicated staff for public outreach, GIS, or grant management, these functions are addressed through shared responsibilities across departments and through coordination with regional partners such as Napa County, which provides GIS support. This shared staffing approach effectively supports current mitigation activities but represents an opportunity for enhancement as hazard mitigation, climate adaptation, and grant funding efforts expand.

Warning Systems & Services

The City of American Canyon has strong warning and emergency communication capabilities to alert residents, businesses, and visitors of hazardous conditions and emergency situations. The city utilizes the Alert Napa County emergency notification system as its primary platform for disseminating time-sensitive warnings related to natural hazards, evacuations, sheltering, and public safety incidents.

Emergency information is also communicated through city and partner social media channels, which provide rapid updates and situational awareness during evolving incidents. These electronic communication methods are supplemented by non-electronic outreach, including door-to-door notifications when necessary, and emergency vehicle sirens used by police and fire agencies to warn the public in affected areas.

This multi-channel approach helps ensure redundancy and increases the likelihood that critical information reaches residents with varying access to technology or communication needs. Warning systems support response to a range of hazards, including flooding, wildfire, earthquakes, extreme weather, and power shutoff events.

Fiscal

The City of American Canyon has moderate to strong fiscal capacity to support hazard mitigation through a combination of local revenues, fees, grants, and long-term financing tools. These funding mechanisms support infrastructure maintenance, capital improvements, and implementation of hazard mitigation measures identified in city plans and programs.

The city collects utility fees for water, recycled water, and sewer services, which help fund infrastructure upgrades that support drought resilience, flood protection, and system reliability. System development and impact fees are also a key funding source and are assessed for traffic, housing, water and wastewater capacity, parks and recreation, civic facilities, General Plan implementation, and fire district mitigation.

These fees help ensure that new development contributes to infrastructure needed to safely accommodate growth.

American Canyon has the authority to use general obligation bonds and special tax or revenue bonds to finance large capital projects, providing flexibility to fund hazard mitigation–related infrastructure improvements when voter approval or project-specific revenues are available. The city also adopts a Capital Improvement Program (CIP) tied to the annual budget, which prioritizes investments in infrastructure that supports public safety and resilience.

Additional funding sources include Community Development Block Grants (CDBG), which can be used for hazard-related housing rehabilitation and infrastructure improvements, particularly for vulnerable populations. While special-purpose taxes and benefit assessments are not consistently used, the City has the authority to pursue voter-approved tax measures for specific purposes, such as public safety or infrastructure, representing a future opportunity to expand mitigation funding.

Education & Outreach

The City of American Canyon has strong education and outreach capabilities that support public awareness, preparedness, and risk reduction for natural hazards. The city maintains a dedicated emergency preparedness webpage, ReadyAC, which centralizes information on alerts, evacuations, flooding, wildfire, earthquakes, power shutoffs, and other hazards. This resource serves as the primary hub for hazard-related public information.

The city actively uses social media platforms, including City websites, Facebook, Instagram, Nextdoor, and YouTube, to disseminate emergency information, preparedness messaging, and real-time updates during incidents. These digital tools are complemented by participation in annual public safety and preparedness events, such as the Great California ShakeOut and Ready Napa County initiatives.

American Canyon supports community-based preparedness through the Community Emergency Response Team (CERT) program and partnerships with regional organizations, including local Fire Safe Councils and the Napa Communities Firewise Foundation. The city also collaborates with the Napa County Resource Conservation District, which provides outreach related to wildfire, drought, and other environmental hazards.

City staff are available to respond to public inquiries and provide technical assistance related to hazard preparedness, floodplain regulations, and development standards through phone, email, and web-based requests. While hazard information is primarily disseminated online, printed materials and library-based resources are used on a limited basis, representing an opportunity for expanded outreach to residents with limited digital access.

ASSESSMENT LEGEND

HMP Integration

Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Table 1-16: City of American Canyon Capabilities and Opportunities Assessment

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Planning and Regulatory Capabilities				
Construction and Future Development Regulations				
Building Codes				California Building Code (California Code of Regulations, Title 24) adopted under Title 16
BCEGS Rating				
Public Protection (ISO Class)				
Hazard-Related Development Standards				Floodplain Management Regulations (Ch. 8.16), Fire Regulations (Ch 8.08), Stormwater and Pollution Discharge Control (Ch. 14.28), Water Conservation (Ch. 13.14), Subdivision including standards for inundation and steep slope areas (Title 18), and Zoning (Title 19) including standards for water efficiency, floodplains, and hillsides
Zoning Ordinance				Title 19 including standards for water efficiency, floodplains, and hillsides
Hazard-Specific Ordinance				Floodplain Management Regulations (Ch. 8.16), Stormwater and Pollution Discharge Control (Ch. 14.28), and Water Conservation (Ch. 13.14)
Growth Management Ordinance				Growth managed through policies in 1994 General Plan Land Use and other Elements (amended 2021); 2040 GP update in progress includes updated growth management policies
Hazard Reduction Programs (Annually Conducted)				

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Capital Improvements Program (CIP) or Plan				FY 2025-29 CIP and budget covers developing and maintaining infrastructure services to support sustainable growth
Erosion/Sediment Control Program				Ch 14.28 Stormwater and Pollution Discharge Control
Hazard-Related Public Outreach Program				Emergency preparedness webpage (ReadyAC) centralizes hazard information (alerts, evac, flooding, wildfire, earthquakes, PSPS)
Urban Water Management Plan				2020 UWMP maintained by Utilities & Services Dept
Stormwater Management Program (Annual Inspections)				Ch 14.28 Stormwater and Pollution Discharge Control, enforced by Utilities & Services Dept
Seismic Safety Program (Non-structural)				ReadyAC webpage provides info and checklists for earthquake preparedness
Earthquake Modernization Plan (Building Safety)				2040 General Plan includes updated Safety Element policies and actions to address seismically unsafe buildings; also addressed enforcement of the California Building Code with local seismic amendments
Hazard Plans				
General Plan Safety Element				1994 General Plan Flood Hazards and Geology Elements (amended 2021); 2040 GP includes new consolidated Safety Element encompassing wildfire, flood, geologic, seismic, and climate change hazards
Site Plan Review Requirements				Ch 19.41 design permit review process
General Plan Environmental Justice Element				Not addressed in 1994 General Plan (amended 2021); 2040 GP update in progress includes new Environmental Justice Element
Community Wildfire Protection Plan (CWPP)				2021 Napa County CWPP
Economic Development Plan				1994 General Plan Economic Development Element (amended 2021); 2040 GP includes updated element
Floodplain Management Plan				1994 General Plan Flood Hazards Element (amended 2021); 2040 GP includes new consolidated Safety Element encompassing flood; Ch 8.16 Floodplain Management Regulations
Stormwater Management Plan				2040 General Plan includes Utilities and Environment, Parks & Recreation Elements that address storm drainage and water quality; Ch 14.28 Stormwater and Pollution Discharge Control, enforced by Utilities & Services Dept

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Emergency Operations Plan				2017 Napa County EOP, City of American Canyon Annex
Climate Action Plan				Napa County Regional Climate Action and Adaptation Plan (RCAAP)
Climate Vulnerability Assessment				Napa County RCAAP includes assessment
Urban Greening Plan				No standalone plan; policies established in 1994 General Plan Natural & Historic/Cultural Resources Element (amended 2021); 2040 GP includes new Environment, Parks & Recreation Element that covers urban forestry
Ground Water Management Planning / Plans				Maintained by Napa County Groundwater Sustainability Agency; 2020 UWMP maintained by Utilities & Services Dept; Ch. 13.14 Water Conservation
National Flood Protection Program (NFIP)				
Floodplain Management Regulations				Ch 8.16 Floodplain Management Regulations
Flood Insurance Education and Technical Assist.				Flood preparedness info provided through ReadyAC webpage, but no insurance education; staff available for technical assistance
Flood Insurance Study				2016 FEMA FIS 06055CV000C
Elevation Certificates				Maintained by Building Division in Community Infrastructure & Development (CID) Dept
Flood Hazard Mapping / Re-Mapping				FEMA FIRMs 2008 and 2016
Community Rating System (CRS)				Does not currently participate; future opportunity but limited staff capacity
Administrative and Technical				
Community Planning and Development Services				
Community Planner				Community Infrastructure & Development Dept, Planning & Zoning Division
Planner/Engineer (Land Development)				Community Infrastructure & Development Dept, Planning & Zoning Division
Engineer/Professional (Construction)				Community Infrastructure & Development Dept, Public Works Division
Planner/Engineer/Scientist (Natural Hazards)				Community Infrastructure & Development Dept, Public Works Division
Transportation Planner				Community Infrastructure & Development Dept, Public Works Division

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Resiliency Planner				Community Infrastructure & Development Dept, Planning & Zoning Division
Building Code Official (Full time or Augmented)				Community Infrastructure & Development Dept, Building Division
Floodplain Administrator				City Manager
Fire Marshal				American Canyon Fire Protection District
Dedicated Public Outreach Personnel				City Manager's Office, Communications Team
GIS Specialist and Capability				No dedicated staff; shared across departments and supported by Napa County GIS; future opportunity
Emergency Manager				City Manager designated Director of Emergency Services
Dedicated Grant Manager, Writer, or Specialist				No dedicated staff; shared across departments; future opportunity
Other	N/A	N/A	N/A	
Warning Systems/Services				
General				Alert Napa County system, social media posts, non electronic communications, and emergency vehicle sirens
Flood				Alert Napa County system, social media posts, non electronic communications, and emergency vehicle sirens
Tornado				Alert Napa County system, social media posts, non electronic communications, and emergency vehicle sirens
Wildfire				Alert Napa County system, social media posts, non electronic communications, and emergency vehicle sirens
Geological Hazards	#N/A	#N/A	#N/A	#N/A
Fiscal Capabilities				
Financial Resources for Hazard Mitigation				
Levy Taxes for Specific Purposes				Not consistently applied, but can place special tax measures on ballot for specific purposes (e.g., sales tax for public safety)
Utilities Fees				Water, recycled water, and sewer fees
Benefit assessments				Not currently in use; future opportunity
Community Development Block Grants				Received via HUD; can support hazard-related housing rehabilitation and infrastructure

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
System Development Fee				Impact fees collected for Traffic Impact, Housing Nexus, Water and Wastewater Capacity, Parks & Recreation Impact, Civic Facility, General Plan Impact, and Fire District Mitigation
General Obligation Bonds to Incur Debt				General obligation bonds are available financing tools
Special Tax Bonds to Incur Debt				Special tax/revenue bonds are authorized for specific projects
Withheld Spending in Hazard-Prone Areas				General Plan policies restrict development in hazard-prone areas
Stormwater Service Fees				Grading and Drainage Plan review fees
Capital Improvement Project Funding				CIP adopted; tied to annual budget
Education / Outreach Capabilities				
Education/Outreach Resources				
Website Dedicated to Hazard Topics				Emergency preparedness webpage (ReadyAC) centralizes hazard information (alerts, evac, flooding, wildfire, earthquakes, PSPS).
Dedicated Social Media				Active Facebook, Instagram, Nextdoor, and YouTube accounts
Local Citizen Groups That Communicate Hazard Risks				Informal local groups provide hazard information
Hazard Info. Avail. at Library/ Planning Desk				Hazard info available via City website and partner websites
Annual Public Safety Events				Participates in Earthquake ShakeOut, Ready Napa County, and other regular events
Ability to Field Public Tech. Assistance Requests				Staff respond to inquiries via phone, email, and web forms; department-specific technical assistance available
Public Safety Newsletters or Printed Outreach				Monthly Public Safety Newsletter
Community Emergency Response Team (CERT)				American Canyon CERT
Fire Safe Councils				Fire Safe Council and others through Napa Communities Firesafe Foundation
Firewise				Actively pursuing with Napa Firewise
StormReady				Not currently designated
Resource Conservation Districts				Napa County RCD provides outreach on wildfire, drought, and other hazard topics; City participates through partnerships

	HMP Integration			
Resource	Status	Current Mitigation Use	Future Opportunity	**Notes / Additional Detail**
Other	N/A	N/A	N/A	

1.6.2 City of American Canyon Mitigation Action Plan

American Canyon's mitigation actions were developed through a collaborative process informed by the updated risk assessment, local priorities, and extensive stakeholder engagement. As part of this 2026 MJHMP update, the city reviewed mitigation actions from its prior Local Hazard Mitigation Plan to determine which actions to carry forward, which to consolidate, and where entirely new strategies were required. This careful evaluation ensured that the updated action plan builds upon past commitments while also responding to current risks and future challenges.

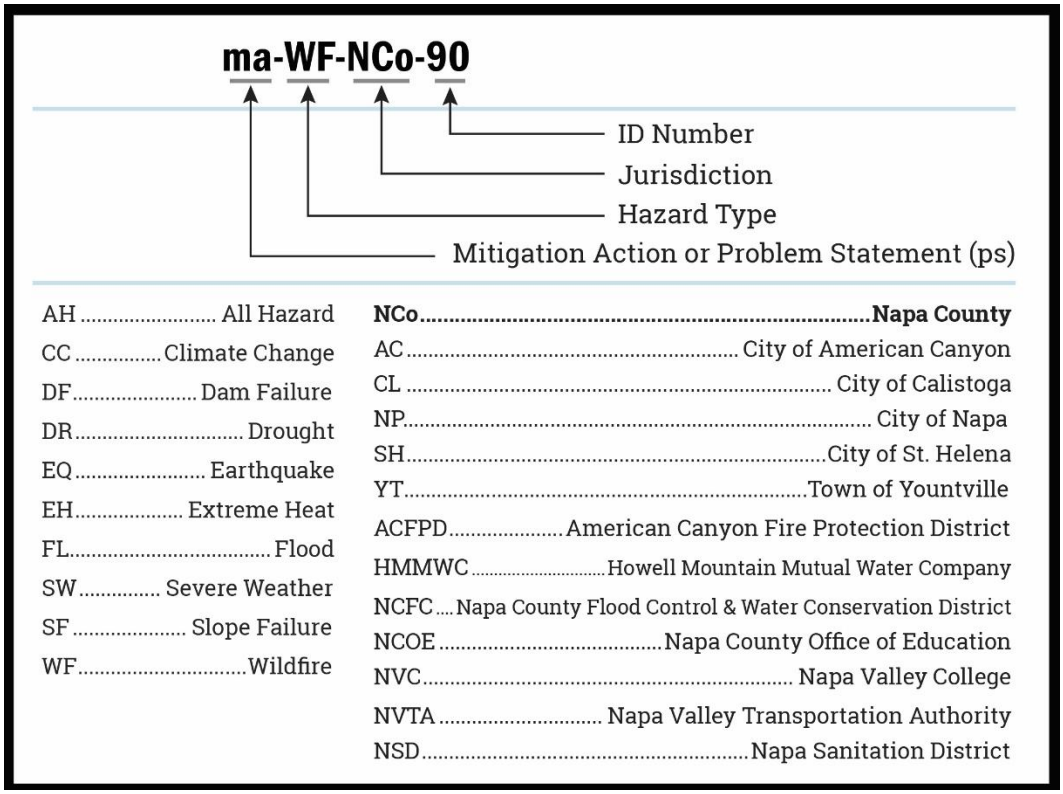


Figure 1-22: Mitigation Action Number Key

The plan addresses American Canyon's most significant hazards, including wildfire, earthquake, flood, slope failure, drought, dam failure, and extreme weather. Each mitigation action is designed to align with FEMA's hazard mitigation guidance and the requirements of the Disaster Mitigation Act of 2000. Where appropriate, overlapping or redundant actions were consolidated into broader, more comprehensive strategies that improve clarity, increase feasibility, and strengthen regional coordination.

The mitigation action prioritization method used by all participating jurisdictions is described in Volume 1, Section 4. Each action specific to American Canyon is documented in Table 1-17, which identifies the responsible department, implementation timeframe, potential funding sources, and resources required to complete the action. Each action is also assigned a unique alphanumeric identifier (see Figure 1-22) that links the strategy to its associated hazard and supports consistent monitoring and reporting.

American Canyon's approach recognizes that some hazards are most effectively addressed through regional efforts. Flood protection, drought resilience, and wildfire risk reduction often extend beyond the city's boundaries and require collaboration with county, regional, and state partners. By aligning local actions with regional strategies, American Canyon helps to consolidate resources, maximize funding

opportunities, and ensure that mitigation projects achieve the greatest benefit for San Pablo Bay, the Napa Valley, and the wider Napa County community.

Collectively, these mitigation actions provide a roadmap for reducing hazard risk, protecting vulnerable populations, and strengthening the long-term resilience of American Canyon.

Table 1-17: City of American Canyon Mitigation Action Plan

Mitigation No.	Hazard Type	Sub-Hazard	Mitigation Type	Year	Primary Agency	Title	Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Problem Statements
ma-CC-AC-10	Climate Change	Sea Level Rise	PPRO - Property Protection , NRP - Natural Resource Protection , SP - Structural Projects	2020	City of American Canyon	Critical Facilities Sea-Level Rise Protections	Design and construct sea level rise adaptation measures for critical facilities like the WWTP, Public Works Yard, pump stations, and Wetlands Edge Road, including measures such as ecologically responsive shoreline hardening and elevation.	Community Infrastructure & Development Department	High	High	3-5 Years	Project	HMGP / BRIC , FMA , General Fund	High	ps-CC-AC-16, ps-FL-AC-120, ps-FL-AC-122, ps-FL-AC-123
ma-DF-AC-215	Dam Failure		PE&A - Public Education & Awareness , ES - Emergency Services	2026	City of American Canyon	Dam Inundation Preparedness	Enhance public education and awareness of dam inundation risk and preparedness through outreach and signage for neighborhoods and in inundation zones.	City Manager's Office	Low	Medium	3-5 Years	Capacity / Capability Building	HMGP / BRIC , General Fund	Medium	ps-DF-AC-32, ps-DF-AC-33
ma-DR-AC-20	Drought		PRV - Prevention , PE&A - Public Education & Awareness	2020	City of American Canyon	Drought Preparedness Program	Strengthen drought preparedness with mandatory conservation triggers, recycled water expansion, leak-detection programs, and targeted assistance for seniors and renters.	Community Infrastructure & Development Department	Low	Medium	3-5 Years	Project	HMGP / BRIC , General Fund	High	ps-DR-AC-42, ps-DR-AC-308, ps-CC-AC-307
ma-EQ-AC-32	Earthquake		PE&A - Public Education & Awareness	2013	City of American Canyon	Seismic Safety Outreach Program	Conduct annual public outreach and enhance public information on seismic safety by promoting the Brace & Bolt program and through workshops targeted for renter and mobile home resident safety education.	Community Infrastructure & Development Department	Low	Medium	Ongoing	Capacity / Capability Building	HMGP / BRIC , General Fund	Medium	ps-EQ-AC-69, ps-EQ-AC-70, ps-EQ-AC-71
ma-EQ-AC-33	Earthquake		PPRO - Property Protection , SP - Structural Projects	2020	City of American Canyon	Critical Facilities Seismic Retrofits	Assess critical facilities and infrastructure and retrofit high-priority assets to maintain functionality after severe shaking.	Community Infrastructure & Development Department	High	High	5-10 Years	Project	HMGP / BRIC , General Fund	Medium	ps-EQ-AC-79, ps-EQ-AC-80, ps-EQ-AC-70
ma-EH-AC-216	Extreme Heat		PPRO - Property Protection , ES - Emergency Services	2026	City of American Canyon	Enhance Cooling Centers Network	Identify, assess, and improve facilities for use as cooling centers and other shelters, such as the Adult Activity Center, Mikolajcik Center, and City Hall, including back-up power and ADA upgrades.	City Manager's Office	Medium	Medium	3-5 Years	Capacity / Capability Building	HMGP / BRIC , General Fund	Medium	ps-EH-AC-310, ps-EH-AC-311, ps-EH-AC-312, ps-EH-AC-313
ma-FL-AC-46	Flood		PPRO - Property Protection , PE&A - Public Education & Awareness	2013	City of American Canyon	Flood Mitigation Support Program	Assist property owners with flood mitigation for flood-prone residential structures, especially 100-yr and 500-yr floodplain mobile home parks and vulnerable neighborhoods.	Community Infrastructure & Development Department	High	High	5-10 Years	Project	HMGP / BRIC , FMA , General Fund	Medium	ps-FL-AC-122, ps-FL-AC-121, ps-FL-AC-120
ma-FL-AC-47	Flood		PE&A - Public Education & Awareness , ES - Emergency Services	2020	City of American Canyon	Flood Notification System Improvement	Improve flood alerts by integrating early warning systems like real-time stream and culvert monitors and enhanced coordination with NWS and other partners.	Community Infrastructure & Development Department	Medium	Medium	3-5 Years	Project	HMGP / BRIC , General Fund	High	ps-DF-AC-32, ps-DF-AC-33, ps-FL-AC-120, ps-FL-AC-120, ps-FL-AC-123

Mitigation No.	Hazard Type	Sub-Hazard	Mitigation Type	Year	Primary Agency	Title	Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Problem Statements
ma-SW-AC-121	Severe Weather	Heavy Rain	PRV - Prevention , NRP - Natural Resource Protection , SP - Structural Projects	2020	City of American Canyon	Stormwater Drainage Resilience Program	Update the stormwater management plan and repair, upsize, or replace known failing culverts and drainage infrastructure contributing to recurrent flooding along American Canyon Creek and tidal areas, including through nature-based solutions where feasible.	Community Infrastructure & Development Department	Medium	High	3-5 Years	Project	HMGP / BRIC , FMA , General Fund	High	ps-SW-AC-143, ps-SW-AC-309
ma-SW-AC-214	Severe Weather		NRP - Natural Resource Protection , ES - Emergency Services	2026	City of American Canyon	High Wind Resilience Program	Regularly assess and mitigate wind damage-prone trees along major corridors and around critical facilities and install backup power to ensure continuity of services.	Community Infrastructure & Development Department	Medium	High	3-5 Years	Capacity / Capability Building	HMGP / BRIC , General Fund	Medium	ps-SW-AC-143, ps-SW-AC-309
ma-SF-AC-217	Slope Failure		NRP - Natural Resource Protection , SP - Structural Projects	2026	City of American Canyon	Slope Stability Assessment & Erosion Control Improvements	Identify and assess high-risk slopes and incorporate any needed improvements into the CIP for stabilization, stormwater management, erosion control, or other mitigation measures.	Parks & Recreation Department	Medium	High	3-5 Years	Project	HMGP / BRIC , General Fund	Low	ps-SF-AC-314, ps-SF-AC-315, ps-SF-AC-316
ma-WF-AC-86	Wildfire		PPRO - Property Protection , NRP - Natural Resource Protection	2020	City of American Canyon	WUI Protection Program	Maintain and expand fuel breaks, improve defensible space around structures, and conduct structural hardening at critical facilities, including Legacy High School, Water Treatment Plant, and utility corridors.	Community Infrastructure & Development Department	Medium	High	1-3 Years	Project	HMGP / BRIC , General Fund , CalFIRE	High	ps-WF-AC-173, ps-WF-AC-174, ps-WF-AC-175, ps-WF-AC-185

1.6.3 Status of Previous Mitigation Actions

In 2020, the City of American Canyon adopted its previous FEMA-approved HMP. This 2026 MJHMP represents a comprehensive update from that previous plan, as discussed in Volume 1, Section 1.5. Table 1-18 provides status updates for all of the previous mitigation actions in the City of American Canyon HMP, from which many of the mitigation actions in Table 1-17 were sourced and revised.

Table 1-18: City of American Canyon Status of Previous Mitigation Actions

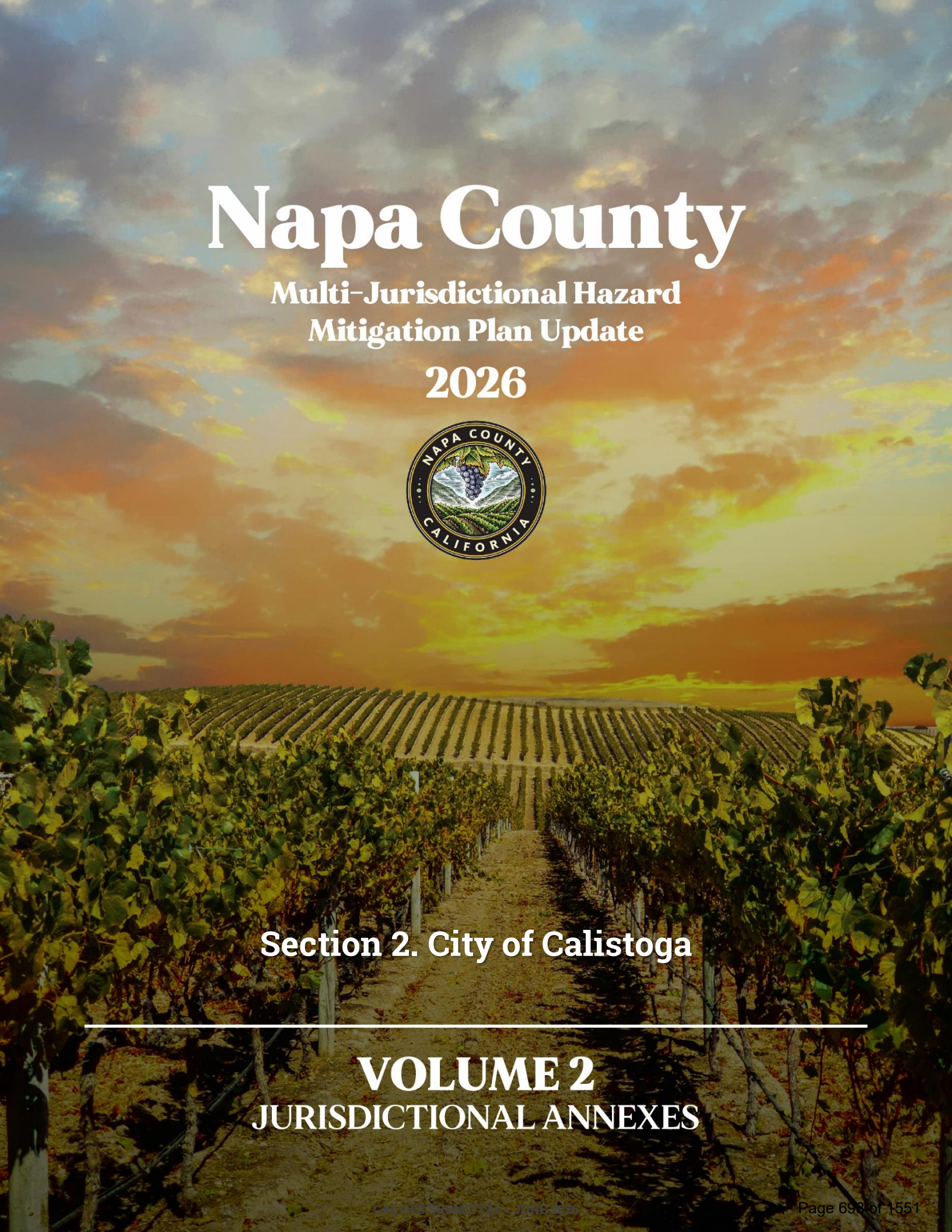
Mitigation No.	Hazard Type	Status	Year	Primary Agency	Title/Description	Reason Completed/ Cancelled
ma-CC-AC-10	Climate Change	Ongoing	2020	City of American Canyon	Critical Facilities Sea-Level Rise Protections	Revised
ma-DR-AC-20	Drought	Ongoing	2020	City of American Canyon	Drought Preparedness Program	Revised
ma-EQ-AC-32	Earthquake	Ongoing	2013	City of American Canyon	Seismic Safety Outreach Program	Revised
ma-EQ-AC-33	Earthquake	Ongoing	2020	City of American Canyon	Critical Facilities Seismic Retrofits	Revised
ma-FL-AC-46	Flood	Ongoing	2013	City of American Canyon	Flood Mitigation Support Program	Revised
ma-FL-AC-47	Flood	Ongoing	2020	City of American Canyon	Flood Notification System Improvement	Revised
ma-SW-AC-121	Severe Weather	Ongoing	2020	City of American Canyon	Stormwater Drainage Resilience Program	Revised
ma-WF-AC-86	Wildfire	Ongoing	2020	City of American Canyon	WUI Protection Program	Revised

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Napa County

Multi-Jurisdictional Hazard Mitigation Plan Update

2026



Section 2. City of Calistoga

VOLUME 2
JURISDICTIONAL ANNEXES

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Napa County

2026 Multi-Jurisdictional Hazard Mitigation Plan Update

City of Calistoga (CL)

Municipal Annex

Section 2. City of Calistoga 2-7

2.1 Scope & Purpose 2-7

2.2 Jurisdictional Setting 2-7

2.2.1 Geography & Climate 2-8

2.2.2 Demographics & Vulnerable Populations 2-10

2.2.3 Economy 2-26

2.2.4 Growth Trends & Future Development 2-26

2.3 Planning Process 2-27

2.3.1 Public Input & Draft Review 2-29

2.4 What's New 2-30

2.4.1 Mitigation Activities 2-30

2.4.2 Mitigation Successes 2-31

2.5 Risk Assessment 2-31

2.5.1 Hazard Screening & Prioritization 2-32

2.5.2 Vulnerability to Specific Hazards 2-36

2.5.3 Climate Change Impacts & Vulnerable Populations 2-53

2.5.4 Hazard Problem Statements 2-54

2.6 Mitigation Strategy 2-57

2.6.1 Capabilities & Opportunities 2-58

2.6.2 City of Calistoga Mitigation Action Plan 2-71

2.6.3 Status of Previous Mitigation Actions 2-75

List of Figures

Figure 2-1: City of Calistoga Geographic Overview Map 2-9
Figure 2-2: City of Calistoga Median Household Income Map 2-13
Figure 2-3: City of Calistoga Poverty Status Map 2-14
Figure 2-4: City of Calistoga Housing Occupancy Map 2-15
Figure 2-5: City of Calistoga Dependent Age Groups Map 2-19
Figure 2-6: City of Calistoga Disabled Elderly Map 2-20
Figure 2-7: City of Calistoga Race and Ethnicity Map 2-22
Figure 2-8: City of Calistoga Spanish-Speaking Households Map 2-23
Figure 2-9: City of Calistoga CDC Social Vulnerability Index Map 2-25
Figure 2-10: City of Calistoga Risk Assessment Matrix 2-34
Figure 2-11: Exposure Summary – City of Calistoga Wildfire Risk 2-38
Figure 2-12: Exposure Summary – City of Calistoga Earthquake Risk (M7.1 Hunting Creek–Berryessa) 2-41
Figure 2-13: Exposure Summary – City of Calistoga Earthquake Risk (M6.7 West Napa) 2-42
Figure 2-14: City of Calistoga Liquefaction Risk 2-43
Figure 2-15: City of Calistoga Flood Risk (FEMA Zones and DWR Awareness Zones) 2-46
Figure 2-16: Exposure Summary – City of Calistoga Flood Risk (FEMA Zones) 2-47
Figure 2-16: Drought Severity Timeline 2000-2024 2-50
Figure 2-17: Mitigation Action Number Key 2-71

List of Tables

Table 2-1: City of Calistoga Population and Households 2-10
Table 2-2: City of Calistoga Income and Poverty 2-11
Table 2-3: City of Calistoga Renter- and Owner-Occupied Housing 2-12
Table 2-4: City of Calistoga Households with Seniors 2-16
Table 2-5: City of Calistoga Households with Children 2-17
Table 2-6: City of Calistoga Population with Disabilities and Access to Transportation 2-18
Table 2-7: City of Calistoga Household Languages 2-21
Table 2-8: City of Calistoga Planning Team and Steering Group Members 2-28
Table 2-9: City of Calistoga Planning Team Meetings 2-29
Table 2-10: City of Calistoga Document Review of Potential Hazards 2-33
Table 2-11: City of Calistoga Hazards Prioritization Summary 2-35
Table 2-12: City of Calistoga National Flood Insurance Program Information 2-45
Table 2-13: Drought Classifications and Impacts 2-49
Table 2-14: City of Calistoga Hazard Problem Statements 2-54
Table 2-15: City of Calistoga Capabilities and Opportunities Assessment 2-66
Table 2-16: City of Calistoga Mitigation Action Plan 2-73
Table 2-17: City of Calistoga Status of Previous Mitigation Actions 2-75

Adoption Resolution

To comply with the Federal Disaster Mitigation Act of 2000 (DMA 2000), the Calistoga City Council has officially adopted this 2026 Napa County Multi-Jurisdictional Hazard Mitigation Plan, including Volume 1 in its entirety as well as this Volume 2 municipal annex. The adoption of the MJHMP recognizes the city's commitment to reducing the impacts of natural hazards within its jurisdiction and across Napa County.

A copy of the city's adoption record is provided on the following pages. Adoption records for all jurisdictions are summarized in Volume 1, Table ES-1.

ADOPTION RECORD TO BE INSERTED UPON COMPLETION.

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Section 2. City of Calistoga

2.1 Scope & Purpose

This Jurisdictional Annex for the City of Calistoga of the 2026 Napa County Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) details the hazard mitigation planning elements specific to the city's planning area. The annex is not intended to be a standalone document but appends to and supplements the information contained in the umbrella plan document (Volume 1). As such, all sections of the umbrella plan, including the planning process and other procedural requirements, apply to and were met by the City of Calistoga. This annex provides additional information specific to the city, with a focus on hazard identification and risk assessment, vulnerability assessment, problem statements, mitigation strategy, and capabilities assessment. Below are the City of Calistoga Points of Contact:

Primary Point of Contact	Alternate Point of Contact
Jed Matcham, Fire Chief City of Calistoga 1232 Washington Street Calistoga, CA 94515 Telephone: (707) 942-2822 email: jmatcham@calistogaca.gov	Mitchell Celaya, Acting City Manager City of Calistoga 1232 Washington Street Calistoga, CA 94515 Telephone: (707) 942-2813 email: mcelaya@ calistogaca.gov

2.2 Jurisdictional Setting

The City of Calistoga is located in the north-western Napa Valley in Napa County in Northern California, approximately 55 miles north of San Francisco. The city is bounded by the Mayacamas Mountains to the west, the Napa Valley to the south, Mount St. Helena to the north, and the Howell Mountains to the east. The city is situated along Highways 29 and 128, which provide regional access to other parts of Napa County, as well as Sonoma and Lake Counties. Calistoga is a small town characterized by a mix of residential neighborhoods, a Central Business District, resorts and other visitor-serving commercial business, and wine production facilities. The Old Faithful Geyser of California is a local Calistoga landmark.

Calistoga encompasses approximately 2.5 square miles and is located on the Napa River. This varied topography and proximity to a major waterway influences the city's exposure to natural hazards, including flooding, seismic shaking, wildfire along the wildland-urban interface, and climate change-related impacts such as extreme heat and increased flood risk.

The city operates as a general law city under a council-manager form of government and provides a full range of municipal services, including fire protection, police protection, public works, community development, and water, wastewater, and recycled water services.

In addition to its incorporated boundaries, the city provides water and wastewater services to areas outside the city limits. Under California planning law, these extraterritorial service areas are considered part of the

city's planning area because damage to infrastructure beyond municipal boundaries can directly affect public health, safety, and continuity of essential services within Calistoga. The City of Calistoga's location within Napa County is shown in Figure 2-1.

- **Year of Incorporation:** 1886
- **2021 Population:** 5,191 (US Census Bureau, 2021)
- **Population Growth:** Slow population growth from founding until 1970s; moderate population growth since.

2.2.1 Geography & Climate

The City of Calistoga is located in the north-western Napa Valley at the base of the Mayacamas Mountains. The city is bisected by the Napa River. Mount St. Helena, the highest point in Napa County, is located north of Calistoga, and serves as the headwaters of the Napa River. Figure 2-1 provides a geographic overview of Napa County.

Hydrologically, Calistoga is part of the Napa River watershed, which conveys runoff from northern Napa County through the City before discharging into San Pablo Bay. Portions of the city lie near or within historic floodplain areas, particularly adjacent to the Napa River. These low-lying areas are subject to flooding. Stormwater systems throughout the city are designed to manage runoff generated by seasonal precipitation.

The climate in Calistoga and the Napa Valley is warmer than that in the rest of the Bay Area. Nevertheless, in summer, Calistoga and the rest of the Napa Valley are protected from the hot weather of the Central Valley of California by the coastal mountain ranges. The Pacific Ocean provides a source of cool, moist air in the summer, and this steady flow of marine air holds temperatures at a moderate level. The greatest variation in temperature occurs in summer. In Calistoga, average high summer temperatures are in the upper 80's to the mid 90's. Winters are generally mild, but there are occasional cold spells. Average high winter temperatures are in the high 50's to low 60's, while the minimum temperatures are in the upper 20's and 30's. Frost is common during clear, calm mornings in the late fall and winter.

The growing season, which is the period between the last freezing temperature event in spring and the first in fall, ranges from 215 to 260 days in Calistoga. Most of the annual precipitation falls during the period of November through April. The greatest amount of rainfall is expected to range from 0.9 inch in one hour once in two years to 2.1 inches in one hour once in 100 years.

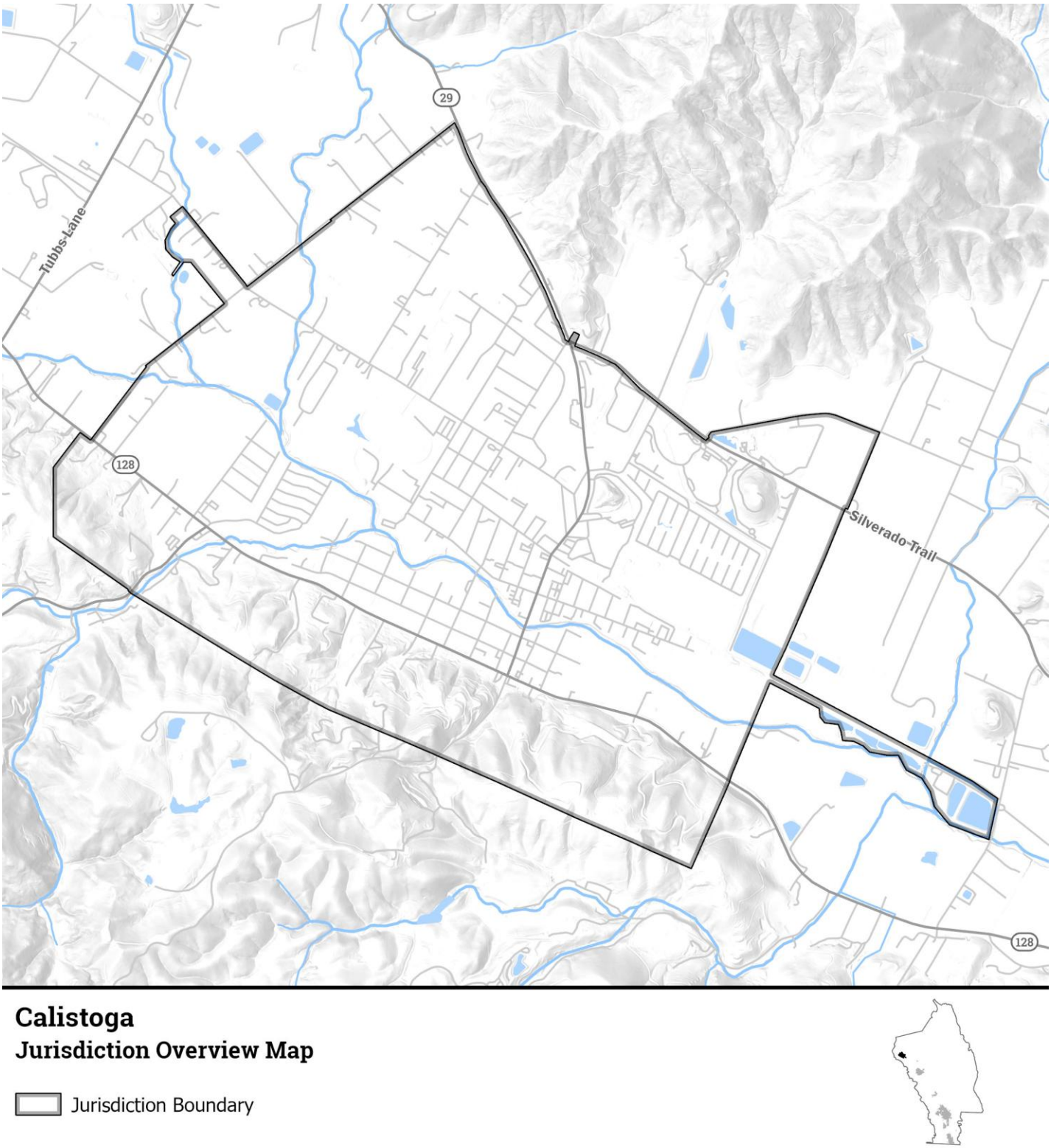


Figure 2-1: City of Calistoga Geographic Overview Map

2.2.2 Demographics & Vulnerable Populations

This section describes the demographic characteristics of the City of Calistoga to guide hazard mitigation planning efforts. Natural disasters affect communities both physically and socially, with demographic composition playing a central role in determining how impacts are distributed, particularly among vulnerable groups facing greater challenges in preparedness, response, and recovery. Understanding the area's social and economic landscape also helps assess potential social costs from infrastructure damage, including housing, industry, public facilities, essential services, and transportation.

Exploring local demographic data may help to identify groups and geographic areas with specific vulnerability to hazard events. In the context of all-hazards preparedness and response planning, at-risk individuals (often used interchangeably with "vulnerable populations") are defined federally as "children, pregnant women, senior citizens, and other individuals who have access or functional needs in the event of a public health emergency." (42 U.S.C. § 2802(b)(4)(B) (2019)) These populations may include, but are not limited to, individuals who are economically disadvantaged, living with disabilities, dependent on caregivers, from historically marginalized communities, have limited English proficiency or are non-English speaking, lack access to transportation, are experiencing homelessness, or have chronic medical conditions.

Certain populations face greater risk following a natural hazard event due to age, economic mobility, physical disability, geographic location, or a combination of factors. Vulnerability in the face of a hazard event is not a fixed characteristic; the same individual may be at risk for some hazards but not at risk for others. Planning for vulnerable populations in the context of hazard mitigation can help communities to prioritize limited resources where they will be the most effective. Refer to Volume 1, Section 1.4.3, for a more in-depth discussion of planning for vulnerable populations, at-risk individuals with access and functional needs, and environmental justice.

The City of Calistoga is also designated as an Equity Priority Community by the Metro Transportation Commission based on specific ACS data that helps indicate community vulnerability such as communities of low income, historically marginalized racial groups, or English proficiency, With this designation, the MTC prioritizes these communities in funding for programs aimed at increasing mobility, affordability and sustainability. Acknowledging this funding source for Calistoga is important when considering future planning projects.

The total population, total number of households, and average household size of the City of Calistoga are presented in Table 2-1, compared to the other municipalities and Napa County. As shown in the table, Calistoga is the second-smallest city in Napa County.

Table 2-1: City of Calistoga Population and Households

Area	Total Population	Total Households (HH)	Average HH Size
Napa County	137,384	55,588	2.40
City of Napa	79,233	31,666	2.47

City of American Canyon	21,669	5,924	3.64
City of Calistoga	**5,191**	**2,330**	**2.20**
City of St. Helena	5,426	2,963	1.81
Town of Yountville	3,397	1,824	1.45

Source: ACS 5-Year, 2017-2022

2.2.2.1 Income & Housing

Economic mobility is one of the most important predictors of natural hazard vulnerability. Low-income residents are more likely to occupy housing which is inadequately maintained or otherwise poorly built to withstand extreme events. For example, mobile or modular homes are more susceptible to damage in earthquakes and floods than other types of residences and are less likely to contain air conditioning units to cope with high heat events. In urban areas, low-income residents are more likely to occupy older homes and apartment complexes with unreinforced masonry, which is particularly susceptible to seismic damage.

Low-income households and communities face disproportionate financial burden from costs associated with disaster preparedness, response, and recovery. Disasters create unexpected expenses which may serve as "tipping points" for families and individuals living on the edge of poverty or homelessness. Recovery costs may be higher for those without resources to conduct hazard mitigation activities ahead of time. Families and individuals who lack access to transportation may be unable to evacuate ahead of an emergency. (Krause & Reeves, 2017)

Low-income residents and renters are also less likely to purchase insurance, meaning that those with the most to lose during an event are also the least prepared to deal with potential losses. Major hurricane events in recent history such as Harvey, Irma, and Katrina all demonstrate that low-income or historically marginalized communities face increased vulnerability to hazard events and struggle the most to recover.

Median household income in the City of Calistoga is just under $97,000, with an overall poverty rate of around 5%. By comparison, median income and poverty rates for Napa County were nearly $106,000 and 8%, respectively; refer to Table 2-2. Median income and poverty rates are also shown on the block group level in Figure 2-2 and Figure 2-3.

Table 2-2: City of Calistoga Income and Poverty

Area	Median Income	Poverty Rate
Napa County	$105,809	7.9%
City of Napa	$100,273	8.1%
City of American Canyon	$122,694	7.4%
City of Calistoga	**$96,667**	**5.4%**
City of St. Helena	$135,781	5.7%
Town of Yountville	$75,134	10.6%

Source: ACS 5-Year, 2017-2022

Renters are also more vulnerable to natural hazards, as they are less likely to take out property insurance and the decision to make major structural improvements typically lies with the property owner. Federal disaster recovery services can exacerbate inequality between renters and homeowners; payout amounts are significantly higher for homeowners applying through FEMA's Individual Assistance (IA) program; from 1999 to 2013 U.S. homeowners saw their wealth increase with local hazard damages, whereas renters' wealth decreased. (Howell, Junia; Elliot, James, 2019)

Approximately 40% of occupied housing units in the City of Calistoga are renters, compared to approximately 35% for Napa County as a whole; refer to Table 2-3.

Table 2-3: City of Calistoga Renter- and Owner-Occupied Housing

Jurisdiction	# Occupied Housing Units	# Renter Occupied	% Renter Occupied	# Owner Occupied	% Owner Occupied
Napa County	49,738	17,676	35.5%	32,062	64.5%
City of Napa	26,978	10,616	39.4%	16,362	60.6%
City of American Canyon	6,192	1,371	22.1%	4,821	77.9%
City of Calistoga	**2,042**	**822**	**40.3%**	**1,220**	**59.7%**
City of St. Helena	2,380	1,048	44%	1,332	56.0%
Town of Yountville	1,050	362	34.5%	688	65.5%

Source: ACS 5-Year, 2017-2022

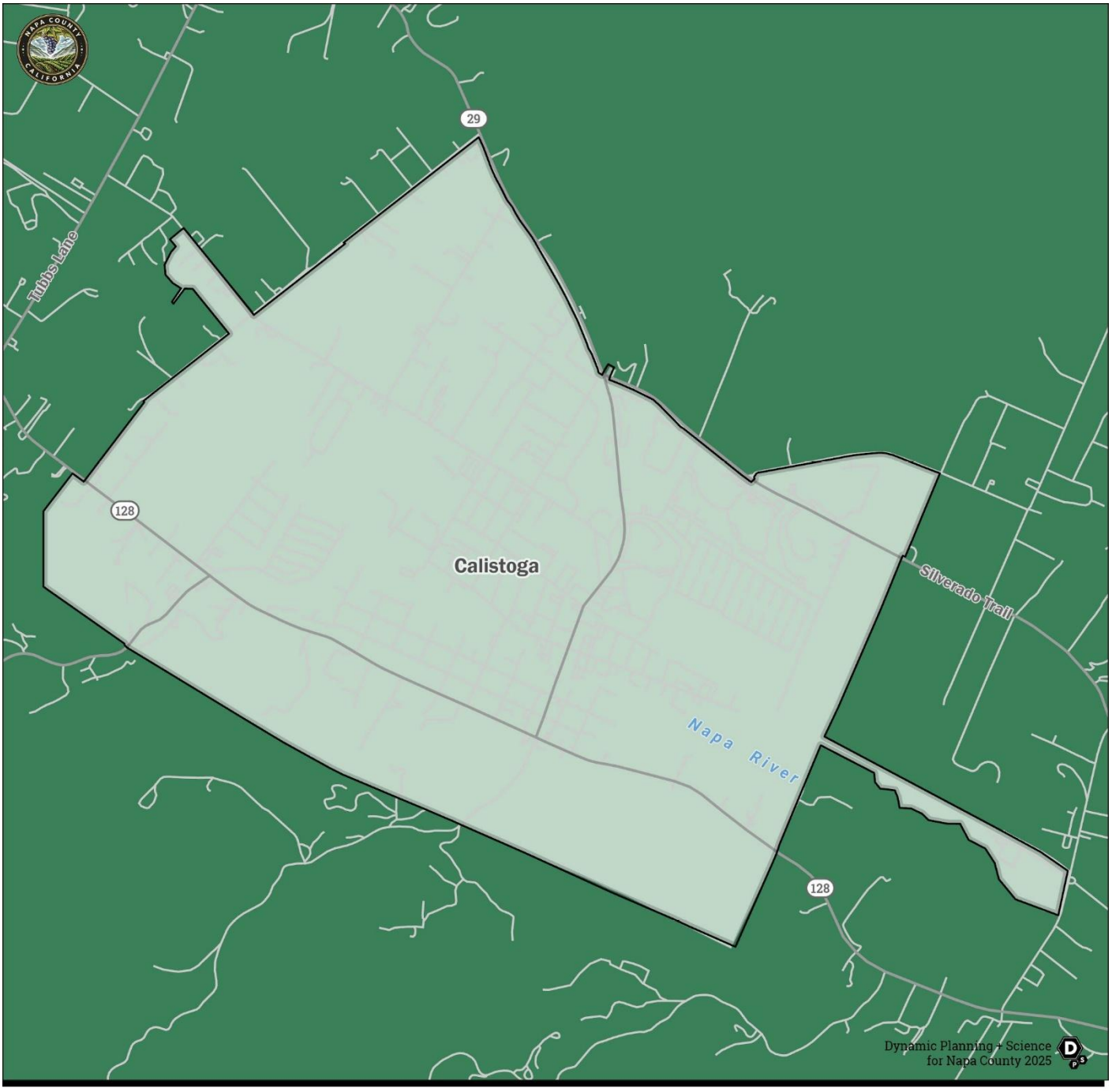


Figure 2-2: City of Calistoga Median Household Income Map

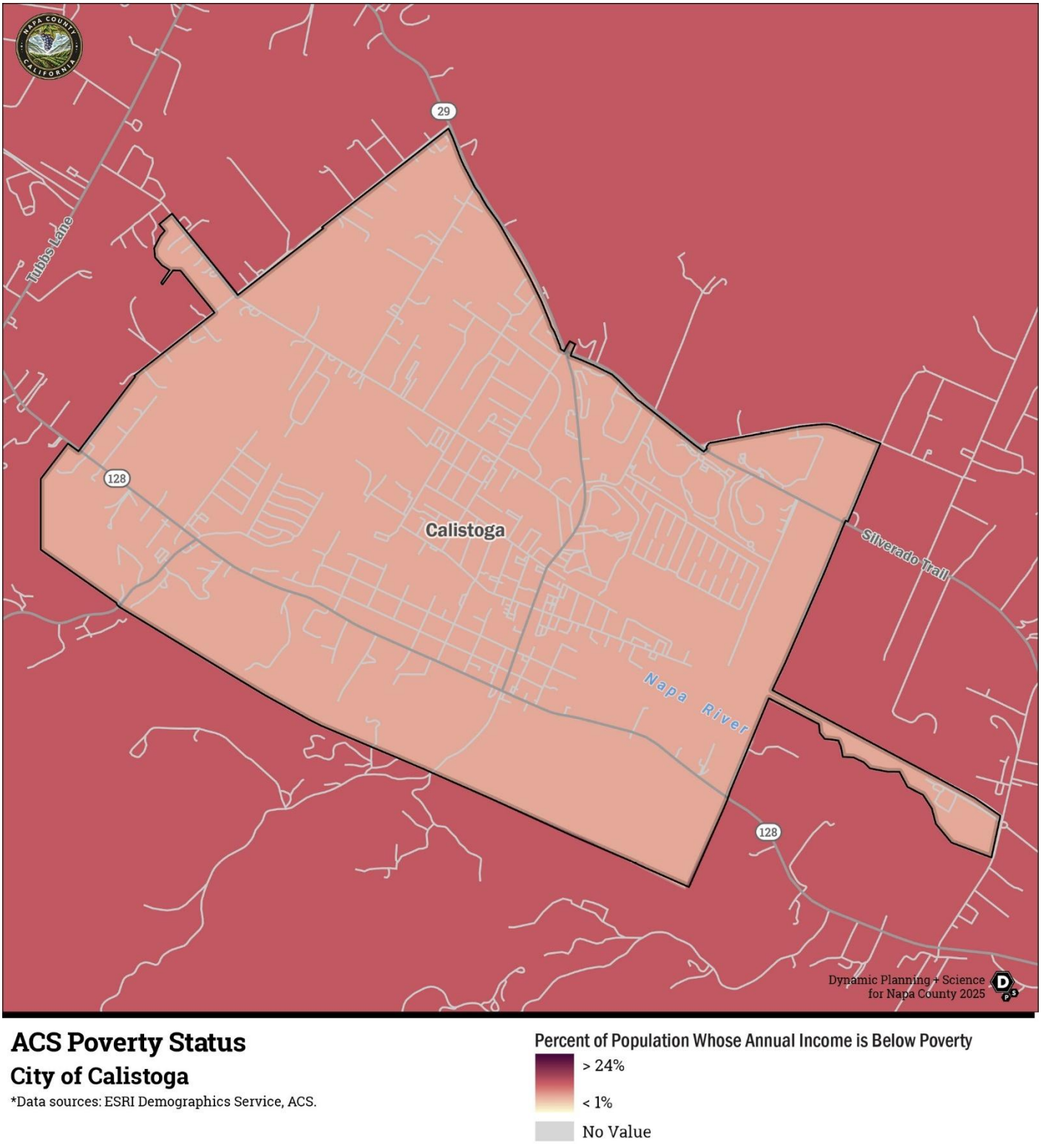


Figure 2-3: City of Calistoga Poverty Status Map

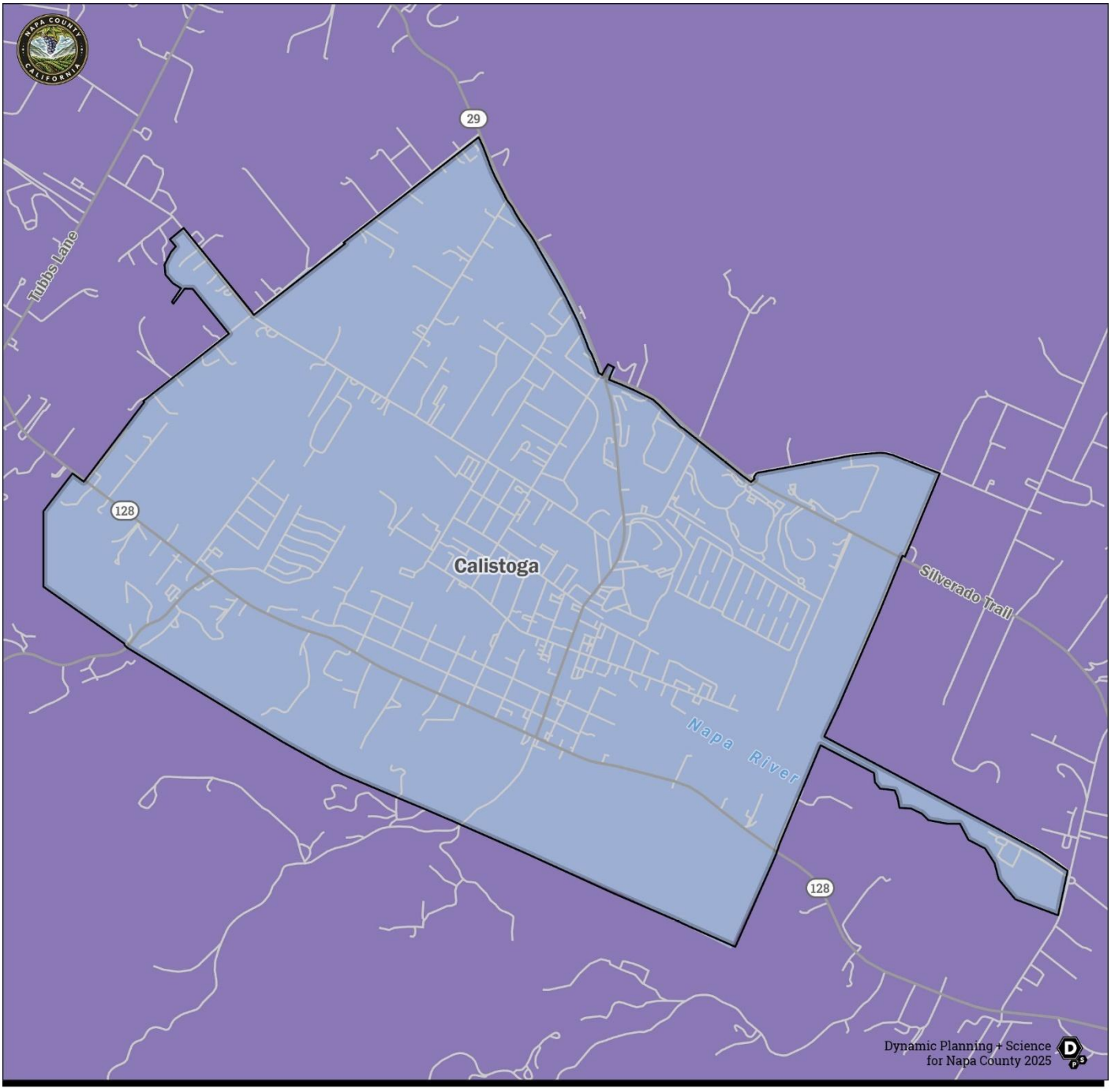


Figure 2-4: City of Calistoga Housing Occupancy Map

2.2.2.2 Dependent & Disabled Populations

Age is a significant factor in assessing vulnerability to natural hazards. Both older adults and children are considered dependent populations due to their reliance on caregivers for safety, mobility, and support during emergency events. These populations face heightened risks during disasters such as floods, wildfires, and earthquakes, particularly when compounding factors such as poverty, disability, or social isolation are present.

In the City of Calistoga, approximately 43% of households include at least one individual over the age of 65, and over 18% of all households consist of seniors living alone. While only around 4% of senior households live below the poverty line (Table 2-4), seniors, particularly those who are low-income or socially isolated, remain among the most vulnerable populations in disaster situations. Challenges for older adults may include limited mobility, chronic health conditions, reduced digital literacy, and lack of access to real-time emergency alerts. Seniors living alone may require additional assistance during evacuations or power outages, and assisted living facilities necessitate advanced coordination to ensure continuity of care and safety during emergencies.

Children represent another dependent population requiring special consideration (Table 2-5). In Calistoga, nearly 20% of households include individuals under the age of 18, with around 1% of these households headed by a single caregiver. During emergencies, children are entirely dependent on caregivers for decision-making, transportation, and access to essential resources. Disruptions to schools, childcare, and youth services can result in significant emotional, educational, and developmental impacts. Families with limited means or single caregivers may also face greater challenges in securing housing, supplies, and recovery assistance.

Figure 2-5 highlights areas within Calistoga with higher concentrations of economically dependent age groups, informing targeted outreach and response strategies during emergencies.

Table 2-4: City of Calistoga Households with Seniors

Jurisdiction	Households (HH)	65+	%	65+ Alone	%	65+ Poverty	%
Napa County	55,588	18,777	33.8%	4,816	8.7%	1,271	2.3%
City of American Canyon	5,924	1,772	29.9%	184	3.1%	111	1.9%
City of Calistoga	**2,330**	**1,003**	**43.0%**	**419**	**18.0%**	**101**	**4.3%**
City of Napa	31,666	10,299	32.5%	2,674	8.4%	703	2.2%
City of St. Helena	2,963	1,153	38.9%	296	10.0%	42	1.4%
Town of Yountville	1,824	873	47.9%	351	19.2%	77	4.2%

Source: ACS 5-Year, 2017-2022

Table 2-5: City of Calistoga Households with Children

Jurisdiction	Households	<18	%	<18 Single Caregiver	%
Napa County	55,588	14,596	26.3%	3,109	5.6%
City of American Canyon	5,924	2,633	44.4%	417	7.0%
City of Calistoga	**2,330**	**471**	**20.2%**	**33**	**1.4%**
City of Napa	31,666	8,934	28.2%	2,315	7.3%
City of St. Helena	2,963	619	20.9%	168	5.7%
Town of Yountville	1,824	160	8.8%	0	0.0%

Source: ACS 5-Year, 2017-2022

Elderly populations face increased risks during disaster events due to age-related health conditions, mobility limitations, and potential social isolation. In Calistoga, approximately 11% of the non-institutionalized population lives with a disability, a slightly lower rate than the countywide average of 12% (Table 2-6).

Among those with access and functional needs, elderly individuals with disabilities represent a highly vulnerable subpopulation when it comes to disaster preparedness, response, and recovery. This group includes seniors living with physical or cognitive impairments such as hearing or vision loss, reduced mobility, reliance on assistive medical devices, neurodivergence, or chronic health conditions that may be exacerbated by hazard events (e.g., exposure to wildfire smoke or extreme heat).

Figure 2-6 illustrates that in some portions of the city, more than 47% of the elderly population is estimated to have one or more disabilities, while other areas show lower proportions or lack available data. The spatial distribution shown on this map suggests that vulnerability is not uniform across the city and that certain neighborhoods may have greater needs for evacuation assistance, medical support, and continuity of care during emergencies. Seniors with disabilities may also be more sensitive to extended power outages, disruptions to medical services, and transportation interruptions. These risks are expected to increase under climate change conditions that intensify extreme heat events and strain emergency response resources.

The combination of advanced age and disability can present significant challenges not only during emergency response but also in implementing hazard mitigation measures. Elderly individuals with disabilities may face physical, financial, or logistical barriers to undertaking activities such as seismic retrofitting, anchoring fuel tanks, installing foundation bracing, or implementing residential flood-proofing techniques. Many live in older housing stock that is more vulnerable to earthquake damage or repetitive flooding and may lack the resources or support networks needed to complete mitigation upgrades.

Table 2-6: City of Calistoga Population with Disabilities and Access to Transportation

Jurisdiction	Population	Persons w/ Disability	%	Persons Reliant on Public Trans.	%	Households	HH w/o Vehicle	%
Napa County	137,384	16,544	12.0%	890	0.6%	55,588	2,421	4.4%
City of American Canyon	21,669	2,201	10.2%	287	1.3%	5,924	138	2.3%
City of Calistoga	**5,191**	**573**	**11.0%**	**36**	**0.7%**	**2,330**	**83**	**3.6%**
City of Napa	79,233	9,837	12.4%	291	0.4%	31,666	1,554	4.9%
City of St. Helena	5,426	683	12.6%	121	2.2%	2,963	219	7.4%
Town of Yountville	3,397	683	20.1%	15	0.4%	1,824	210	11.5%

Source: ACS 5-Year, 2017-2022

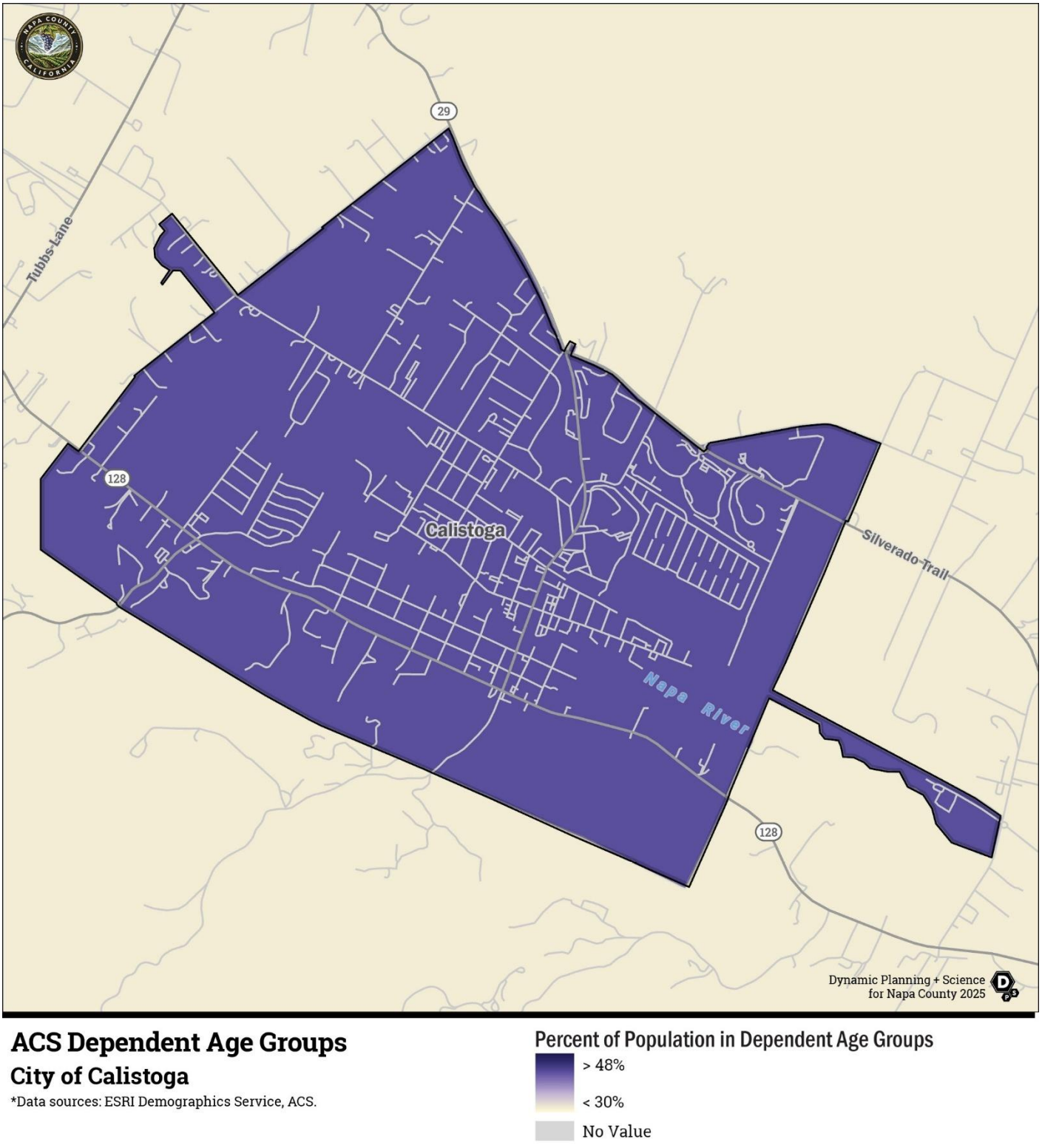


Figure 2-5: City of Calistoga Dependent Age Groups Map

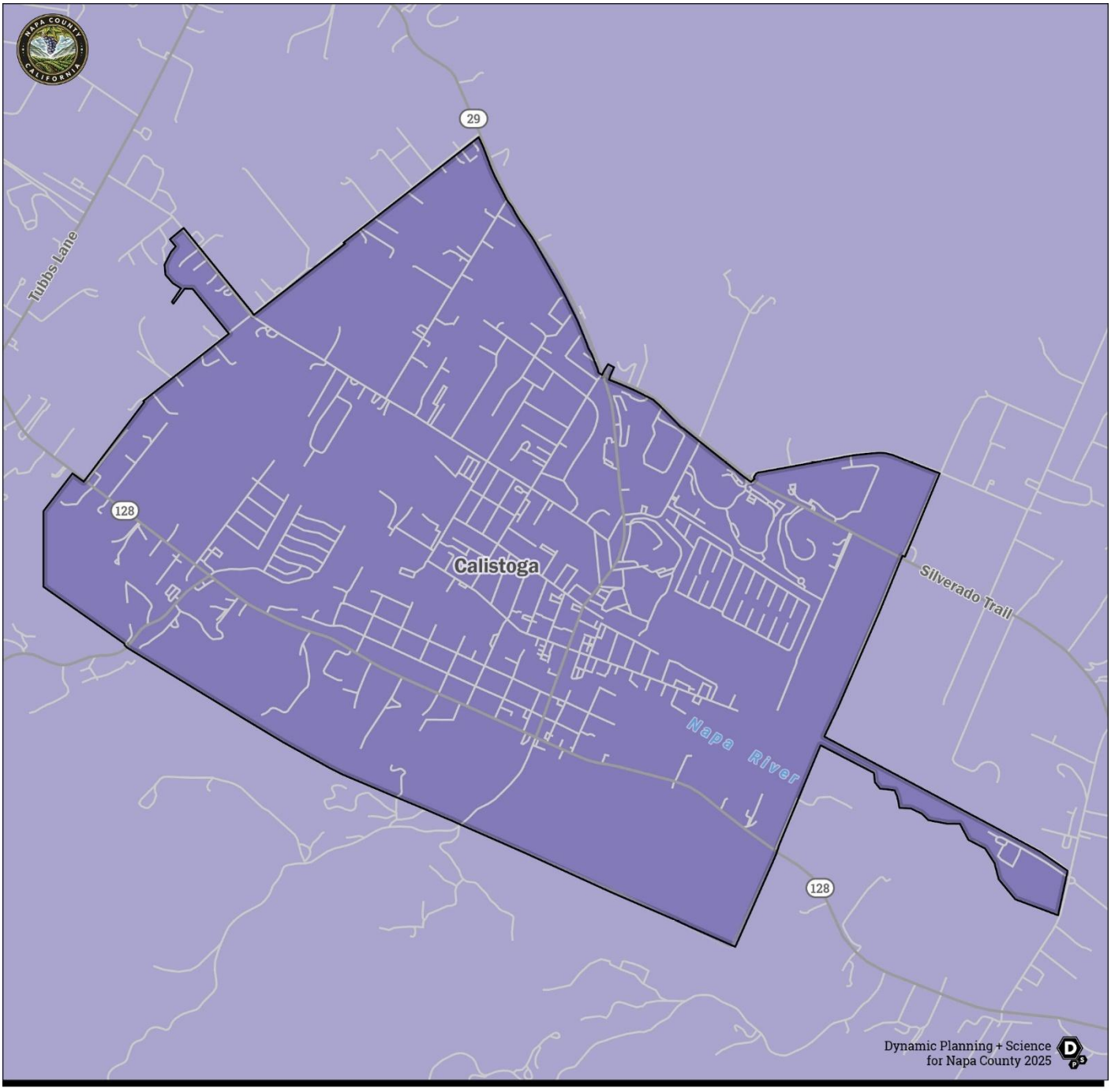


Figure 2-6: City of Calistoga Disabled Elderly Map

2.2.2.3 Race, Ethnicity & Language

Natural disasters compound racial disparities; non-white individuals and communities receive less recovery aid from FEMA than their white counterparts, even where the amount of damage is the same. (Howell, Junia; Elliott, James R., 2019) (National Advisory Council, 2020) These disparities are evidence of the complicated relationship between disaster recovery and overlapping social vulnerabilities including race, income, language, and health. Black and Latino residents are more likely to be low income and renters, conditions which create barriers to navigating FEMA's Individual Assistance programs. Communities with more non-white residents may have lower tax revenue and property values, which means less investment in mitigation and rebuilding efforts before and after an emergency.

Figure 2-7 depicts the racial and ethnic composition of the City of Calistoga. According to ACS data, the city is mostly White, but also has a significant Hispanic or Latino population.

Residents with limited English proficiency (LEP) face heightened barriers to understanding emergency alerts, accessing preparedness resources, and navigating post-disaster recovery programs. In Calistoga, approximately 20% of households speak Spanish, but only around 3% report limited English proficiency. (Table 2-7). Figure 2-8 highlights where Spanish-speaking populations are concentrated in Calistoga.

Table 2-7: City of Calistoga Household Languages

Jurisdiction	Households (HH)	Spanish Speaking	%	Limited English	%	Other Lang.	%
Napa County	55,588	8,738	15.7%	2,141	3.9%	12	0.0%
City of American Canyon	5,924	1,069	18.0%	177	3.0%	-	0.0%
City of Calistoga	**2,330**	**474**	**20.3%**	**63**	**2.7%**	**-**	**0.0%**
City of Napa	31,666	5,800	18.3%	1,653	5.2%	9	0.0%
City of St. Helena	2,963	370	12.5%	88	3.0%	-	0.0%
Town of Yountville	1,824	49	2.7%	21	1.2%	-	0.0%

Source: ACS 5-Year, 2017-2022

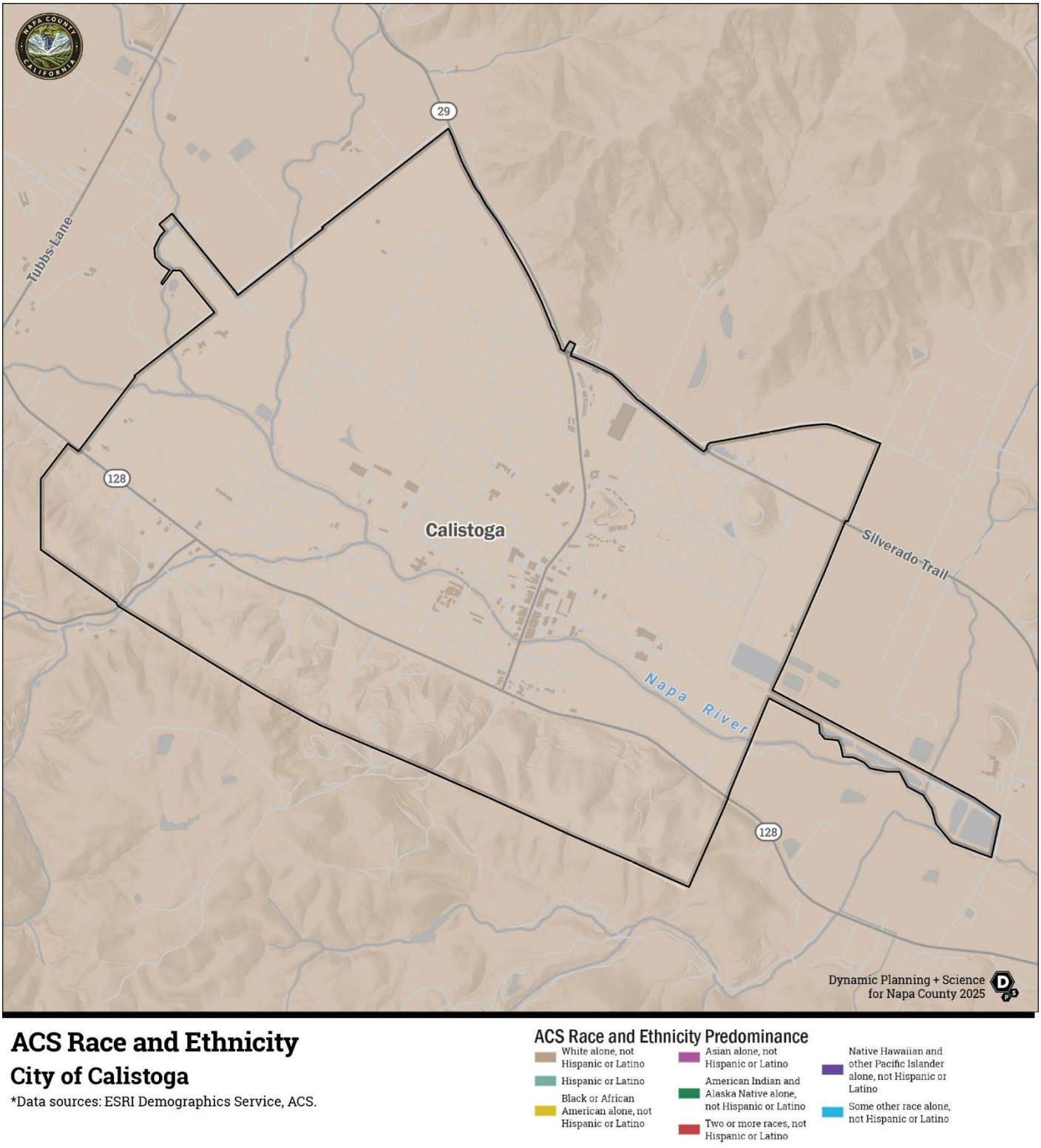
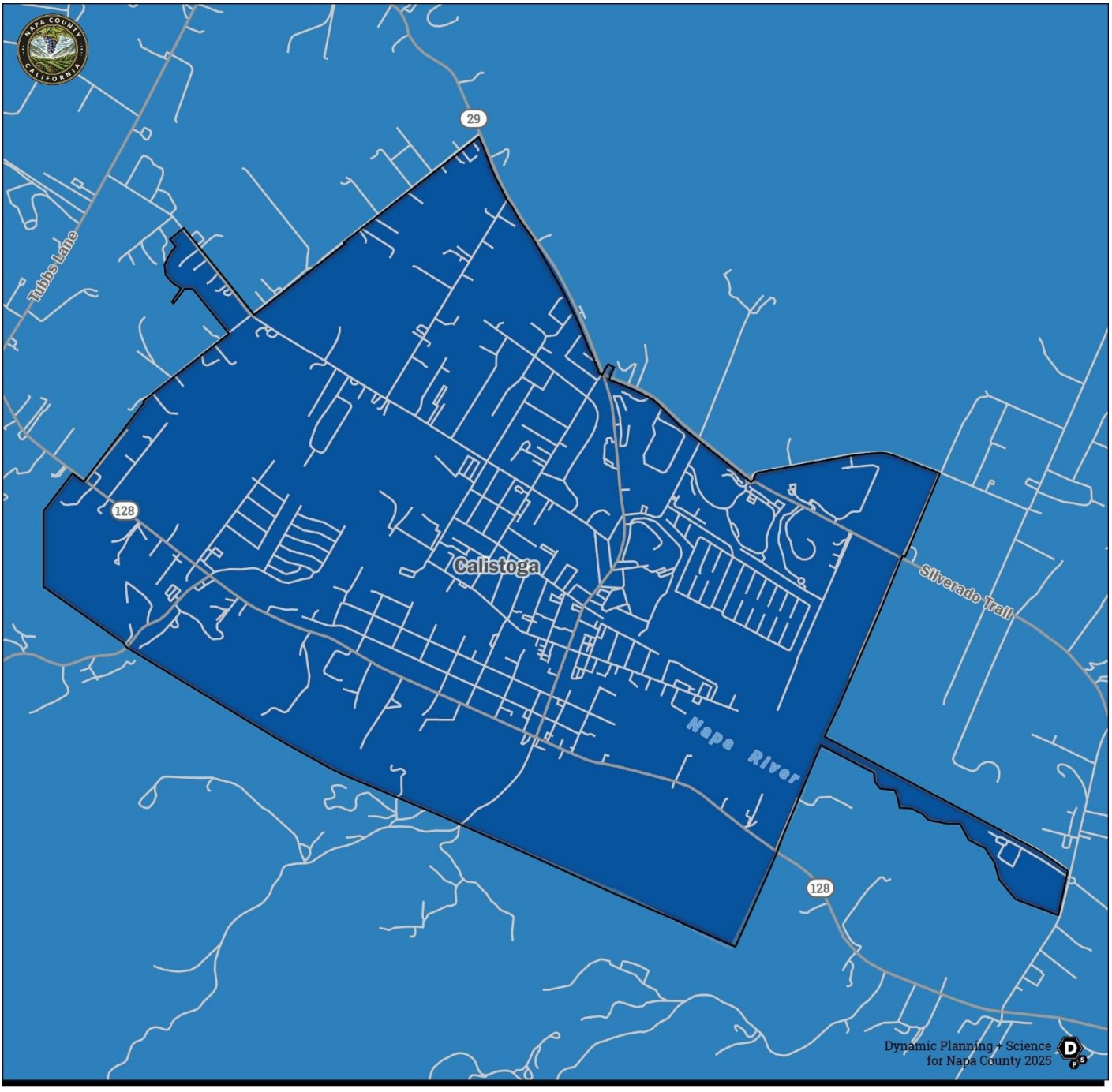


Figure 2-7: City of Calistoga Race and Ethnicity Map



ACS Language Spoken

City of Calistoga

*Data sources: ESRI Demographics Service, ACS.

Percent of Population (5+) Who Speak Spanish at Home

> 33%

< 1%

No Value

Figure 2-8: City of Calistoga Spanish-Speaking Households Map

2.2.2.4 Social Vulnerability Index (SVI)

The Centers for Disease Control and Prevention (CDC) Social Vulnerability Index (SVI) for City of Calistoga reveals important spatial and demographic patterns that have direct implications for equitable hazard mitigation planning. As discussed in detail in Volume 1, Section 1.4.3.6, the SVI is a composite measure developed by the CDC to identify communities that are more likely to require support before, during, and after a disaster. It incorporates a range of factors across four key dimensions: socioeconomic status, household composition and disability, minority status and language, and housing type and transportation access. The resulting index score ranges from 0 (lowest vulnerability) to 1 (highest vulnerability).

Figure 2-9 shows that social vulnerability ranges between 0.50 and 0.75 in Calistoga, which is indicative of moderate SVI. Areas with higher SVI values indicate neighborhoods where residents may have reduced capacity to prepare for, respond to, and recover from hazard events due to factors such as lower income, higher proportions of renters, limited access to vehicles, language barriers, or greater concentrations of elderly and disabled individuals. Conversely, areas with lower SVI scores generally reflect populations with greater access to resources and adaptive capacity.

Spatial patterns in the SVI map suggest that higher social vulnerability is concentrated in portions of the central and southern areas of the city, where multiple vulnerability indicators overlap. These areas may experience disproportionate impacts during events such as flooding, extreme heat, earthquakes, or wildfire smoke episodes, particularly if hazards coincide with power outages, transportation disruptions, or prolonged recovery periods. Residents in higher-SVI neighborhoods may also face challenges accessing emergency information, evacuation assistance, sheltering, and post-disaster financial or housing resources.

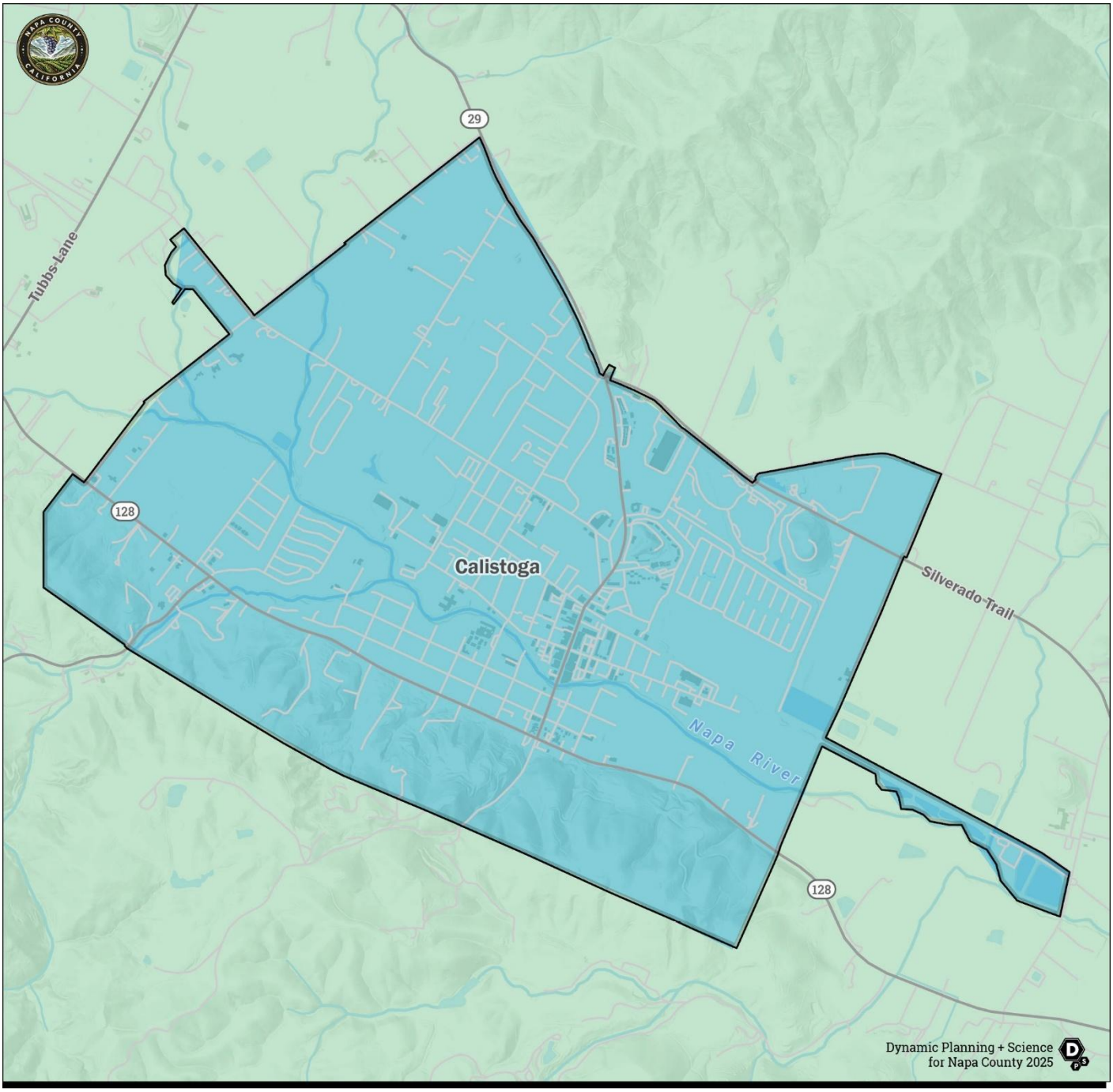


Figure 2-9: City of Calistoga CDC Social Vulnerability Index Map

2.2.3 Economy

The City of Calistoga plays an important economic role within northern Napa County, serving as a local employment center and tourism hub. The local economy is largely centered around visitor-serving commercial uses and wine production. Calistoga's location at the junction of Highways 29 and 128 makes it a crossroads of sort within the upper Napa Valley.

Retail, restaurants, and visitor-serving commercial uses are primarily concentrated on Lincoln Avenue. These businesses contribute significantly to local tax revenues and provide jobs for residents of Calistoga and surrounding communities. At the same time, the concentration of economic activity along Lincoln Avenue increases the importance of protecting critical infrastructure, transportation corridors, and utility systems from natural hazards such as flooding, earthquakes, and power outages.

The city's commercial economy includes neighborhood-serving retail, restaurants, and personal services that support daily needs and contribute to community vitality. These businesses are particularly sensitive to hazard-related disruptions, as temporary closures, infrastructure damage, or reduced access can result in lost income and longer-term economic impacts. Small businesses may have limited capacity to absorb prolonged disruptions, making economic resilience an important consideration in hazard mitigation planning.

A significant portion of Calistoga's workforce is employed in sectors that involve physical labor or outdoor activity, including agriculture and visitor-serving commercial uses. These workers may face heightened exposure to hazards such as extreme heat, wildfire smoke, and poor air quality. Climate change projections indicating more frequent heat events and longer wildfire seasons have implications for worker safety, productivity, and business continuity within these sectors.

Economic vulnerability is also influenced by income variability and employment stability. Workers in hourly or service-based positions may experience immediate income loss during disaster-related closures or evacuations, which can compound household vulnerability and slow community recovery. Protecting employment centers, maintaining transportation access, and ensuring continuity of utilities and communications are therefore key components of reducing economic disruption from hazard events.

2.2.4 Growth Trends & Future Development

The City of Calistoga has experienced moderate growth since the 1970s, with development patterns shaped by adopted growth management policies, infrastructure capacity, and regional housing demand. Growth in recent decades has occurred primarily through planned residential development and visitor-serving commercial uses. This approach reflects the city's long-standing emphasis on directing growth toward areas that can be efficiently served by public services and infrastructure while limiting outward expansion into agricultural and environmentally sensitive lands.

Residential growth has been driven largely by infill development within existing neighborhoods. Recent development activity has included a mix of single-family and multi-family housing intended to

accommodate population growth and meet state-mandated housing requirements. The City's Housing Element and Annual Progress Reports document continued efforts to increase housing supply while addressing affordability, infrastructure demands, and community character.

Future development in Calistoga is expected to continue focusing on buildout of remaining developable parcels within the Urban Limit Line and Sphere of Influence. Planned growth areas are generally located near existing transportation corridors, utilities, and employment centers, supporting more compact and efficient development patterns. This strategy reduces the need for extensive new infrastructure and helps limit exposure to hazards associated with hillside development, wildfire risk, and access constraints.

Economic development is also anticipated to remain a key component of future growth. Expansion and intensification of industrial and commercial uses, particularly those related to logistics, manufacturing, and the wine industry, are expected to support employment and fiscal stability. At the same time, continued development in low-lying areas and near critical transportation routes underscores the importance of incorporating hazard mitigation and climate adaptation measures into future land use and infrastructure planning.

2.3 Planning Process

The City of Calistoga followed the planning process detailed in Volume 1, Section 2, including participating in the county-wide Hazard Mitigation Planning Team (HMPT) and formulating their own internal planning team to support the broader planning process.

The city's representatives in the Steering Group led stakeholder and public engagement efforts alongside the Consultant Team, with assistance from the county-wide HMPT and their internal planning team. This engagement process is described in Volume 1. Specifically, for the City of Calistoga, this included postings to the city website and social media, and outreach events, as documented in Appendix B. Examples of Key Stakeholders engaged by Napa County on behalf of the city with relevance to the development of Calistoga's mitigation strategy include the USDA and other federal agencies; CAL FIRE and other state agencies; other neighboring jurisdictions; community-based organizations such as the Chamber of Commerce; utility providers like PG&E; UC Davis and other academia; and local businesses.

All Key Stakeholders that were invited to participate in the planning process are listed in Volume 1, Section 2, and the input received from stakeholders was integrated into the city's annex, as described in Volume 1 Table 2-9. The city's internal planning team participants, their positions, and how they participated in the planning process are shown in Table 2-8.

Table 2-8: City of Calistoga Planning Team and Steering Group Members

Team Members	Title	Description of Involvement
Jed Matcham	**Fire Chief**	**Lead Point-of-Contact, HMPT #1, and #2, BO #1 and #2**
Mitch Celaya	**Interim City Manager**	**Alternate Point-of-Contact, HMPT #4, BO #2**
Derek Rayner	Public Works Director	Participating Stakeholder, BO #1
Greg Desmond	Planning and Building Director	Participating Stakeholder, BO #1
Hamid Heidary	Senior Civil Engineer	Participating Stakeholder, BO #1
Laura Snideman	Former City Manager	Participating Stakeholder, BO #1
Jason Tamagni	Fire Captain	Participating Stakeholder, BO #1
Mark Woods	Building Official	Participating Stakeholder, BO #1

City of Calistoga participated in a comprehensive hazard mitigation planning process as part of the 2026 Napa County MJHMP update. This included a series of breakout meetings, listed in Table 2-9 that engaged the district's planning team, which included key city personnel and stakeholders in evaluating hazards, identifying local vulnerabilities, and prioritizing mitigation strategies.

The process began with a County-Wide Steering Group Kickoff Meeting on February 28, 2024. This initial meeting focused on welcoming participants, establishing a shared understanding of the project scope and schedule, clarifying roles and responsibilities of the Steering Group, the county-wide Hazard Mitigation Planning Team (HMPT), and individual jurisdictional planning teams, and included a review of key changes since the 2020 Local Hazard Mitigation Plan The meeting set the foundation for coordinated participation throughout the planning effort.

Throughout the series of breakout meetings, the City of Calistoga engaged in a structured and collaborative planning process focused on assessing hazard risks, identifying vulnerabilities, and developing targeted mitigation strategies. The meetings began with recaps of the county-wide HMPT meetings to ensure alignment of goals and progress.

During the August 22, 2024, breakout out meeting, discussions concentrated on community engagement outcomes, initial risk assessments, and the integration of demographic data to better understand vulnerable populations. Jurisdictional teams reviewed their specific hazard exposures using the Risk Assessment Mapping Platform (RAMP) and participated in prioritization exercises to identify their top hazards.

The November 10, 2025, breakout meeting shifted toward reviewing local capabilities and defining specific areas of concern, which informed the drafting of problem statements. Teams worked collaboratively to refine mitigation alternatives, align actions with FEMA guidelines, and develop a shortlist of priority mitigation actions and inter-jurisdictional collaboration opportunities. Participants also engaged in a hexagon mapping activity designed to visually identify mitigation actions that could benefit from or require

inter-jurisdictional coordination. These collaborative efforts helped shape a refined set of mitigation alternatives, establish shared planning goals, and align local strategies with FEMA's Hazard Mitigation Assistance (HMA) funding framework.

The meetings also included consensus-building activities around hazard rankings, capabilities, and planned actions, while providing regular updates on the overall project schedule.

Table 2-9: City of Calistoga Planning Team Meetings

Meeting & Date	Agenda / Topics	Goals / Key Inputs
County-Wide Steering Group and HMPT Kick-off and Meetings #1 & #2 February 28, 2024– July 18, 2024		
Calistoga Planning Team Breakout Meeting #1 August 22, 2024	▪ County-wide HMPT meetings #1 and #2 recaps ▪ Community engagement progress and results ▪ Risk assessment and community vulnerability ▪ Demographics and vulnerable populations ▪ Overview of jurisdiction-specific hazard risks and exposure ▪ Introduction to Risk Assessment Mapping Platform (RAMP) ▪ Jurisdiction-specific hazard risk ranking exercise ▪ Project schedule updates and next steps	▪ Consensus on jurisdiction-specific priority hazards ▪ Identify capabilities and potential mitigation actions ▪ Community engagement volunteers
County-Wide HMPT Meeting #3 March 25, 2025		
Calistoga Planning Team Breakout Meeting #2 November 10, 2025	▪ Breakout Meeting #1 and HMPT #3 recaps ▪ Review capabilities assessment ▪ Review areas of concern and define problem statements ▪ Principles of effective mitigation strategies and actions, and mitigation alternatives ▪ Refine and align jurisdiction-specific mitigation actions exercise ▪ Project schedule updates and next steps	▪ Consensus on jurisdiction-specific capabilities ▪ Consensus on jurisdiction-specific areas of concern ▪ Consensus on priority mitigation actions and collaboration opportunities ▪ Community engagement volunteers
County-Wide HMPT Meeting #4 December 10, 2025		

2.3.1 Public Input & Draft Review

As detailed in Volume 1, Section 2, the draft plan was available for public review and comment from May 15 to June 2, 2026. Public comments received during that time were similar to those gathered throughout the public engagement process, including the need for more equity in the distribution of mitigation activities and funding and the need for enhanced cooperation among jurisdictions, utility providers, and state

agencies. These comments were incorporated into the city's mitigation strategy, as appropriate; although, most were already addressed by the Mitigation Action Plan which was based on previous public input.

Public and stakeholder input was gathered and incorporated throughout the plan development process, before the public review period, such as from the online public survey (see Volume 1, Section 2.1.2 and Appendix B, for details). During the review period, jurisdictional staff and stakeholders that participated in the plan development also reviewed the public draft and provided comments on minor corrections and revisions, which were addressed in the final plan.

2.4 What's New

This section provides an overview of hazard mitigation planning efforts for the planning area and highlights the updates made in the 2026 MJHMP. The City of Calistoga previously participated and maintained a Hazard Mitigation Plan, which guided resilience planning and hazard mitigation actions at the city level. Calistoga is updating their current plan on a county wide level. This integration reflects the city's ongoing commitment to regional resilience and acknowledges that many hazards such as flooding, severe storms, and earthquakes cross jurisdictional boundaries.

Through participation in the MJHMP, Calistoga has identified its highest priority hazards, developed hazard specific problem statements, and proposed actionable strategies to reduce risks. By aligning with countywide partners and leveraging regional resources, Calistoga has strengthened its capacity to prepare for, withstand, and recover from disasters while continuing to protect its unique community character.

2.4.1 Mitigation Activities

The city has successfully implemented several initiatives aimed at addressing identified vulnerabilities. Some of these accomplishments are highlighted in this section and have directly contributed to reducing risks from hazards such as flooding, all hazards, and severe weather. These completed projects showcase Calistoga's ability to effectively plan, fund, and execute measures that protect its residents and infrastructure.

In addition, Calistoga has systematically reviewed and adjusted its mitigation actions, exemplifying adherence to FEMA's Planning Policy Guide principles and emphasizing the importance of dynamic and adaptive mitigation planning. By fostering partnerships, leveraging funding opportunities, and prioritizing equity in implementation, the city aligns with best practices to build resilience against natural disasters. This ongoing effort is a testament to the city's commitment to the principles of risk-informed decision-making, equitable resource allocation, and integration with broader regional and state hazard mitigation objectives.

Adjustments to Previous Mitigation Actions

A significant portion of the city's mitigation efforts remain ongoing or in the pipeline. These actions, ranging from infrastructure upgrades to community outreach initiatives, represent the city's proactive approach to addressing hazards as resources become available.

Recognizing constraints such as limited funding, staffing, and shifting priorities, the city has reevaluated certain initiatives, leading to their reprioritization or canceling of mitigation actions. Factors such as feasibility, cost-effectiveness, and emerging risks informed these decisions, ensuring alignment with the city's updated hazard mitigation goals. Adjustments to previous mitigation actions are documented as part of the City of Calistoga's Mitigation Action Plan Table 2-16, and more specific status updates are provided in Table 2-17.

2.4.2 Mitigation Successes

Calistoga Resiliency Center

The Calistoga Resiliency Center is the world's largest utility-scale, ultra-long duration energy storage project. This first-of-its-kind hybrid hydrogen and battery energy storage system enables a cost-effective, community-scale, clean microgrid that stores and dispatches clean energy, on demand. The microgrid will provide 48 hours of continuous power to Pacific Gas & Electricity Company customers in downtown Calistoga and the surrounding area during a Public Safety Power Shutoffs event.

Hi-Lo Alert System

Recognizing the City of Calistoga susceptibility to wildfires, the Calistoga Fire Department and Calistoga Police Department vehicles are equipped with Hi-Lo Alert Devices that emit a distinctive tone pattern. Traditional emergency alert systems rely of fixed telecommunication facilities such as cell towers that may be out of service during a wildfire. Hence, Calistoga first responder vehicles have the ability provide mobile evacuation alerts via the Hi Lo Alert System.

Updated Safety Element

The Safety Element update includes multiple mitigation-forward policies such as tailored evacuation messaging for single-access neighborhoods, assessing ingress/egress improvements, zone-based evacuation planning, siting critical infrastructure outside hazard zones where feasible, and maintaining participation in the Napa County MJHMP update cycle.

Water Infrastructure Improvements

The Hazard Mitigation Grant Program (HMGP) has allowed the city to receive seismic retrofits with a new 1-million-gallon water tank. Funding has also been allocated for new SCADA/PLC and generators for treatment plants. The city run Wastewater Treatment Plant also received funding for the New Riverside Pond improvements by removing them from floodplain, as well as lining, repairing creek banks from erosion to protect critical wastewater treatment plant infrastructure.

2.5 Risk Assessment

This section focuses on profiling hazards specific to the City of Calistoga and assessing their vulnerability independent of the broader county-wide planning area, which has been evaluated in Section 3 of Volume 1. The hazard profiles in Volume 1 discuss overall impacts to the planning area and describe relevant plans,

policies, and regulations; past events; location; frequency and probability of future occurrences; severity and extent; warning time; secondary hazards; and climate change impacts. For more information on risk assessment methodologies, see Volume 1, Appendix A.

This section includes a tailored vulnerability assessment, analyzing assets at risk such as population, property, and critical facilities and infrastructure unique to the city, and information on city-specific differences in hazard vulnerability across the planning area. It also identifies total city assets at risk, including people, property, and critical facilities and infrastructure within the city. In addition, this section presents growth and development trends for the community, offering insights into vulnerabilities and risks that represent the broader context of assets at risk.

2.5.1 Hazard Screening & Prioritization

Members of the Planning Team from each participating jurisdiction came together to collaboratively decide which county-wide hazards would be included in the MJHMP, and which would be excluded. Hazard screening and prioritization took place early in the process and integrated historic data, local knowledge, and consensus opinions to create a risk assessment matrix for the county as well as for each participating jurisdiction. These matrices indicate the priority of hazards prior to further refinement. Details about this process, the results of the discussion, and in-depth profiles for county-wide hazards can be found in Volume 1, Sections 2 and 3.

The City of Calistoga's internal planning group used the same hazard identification and prioritization process as the county-wide Planning Team. They reviewed previously prepared hazard mitigation plans and other relevant documents to determine the realm of natural hazards that have the potential to affect the city. Table 2-10 provides a crosswalk of hazards identified in select planning documents, including the 2020 Napa County MJHMP, the City of Calistoga General Plan, and the 2023 State of California HMP. The crosswalk was used to develop a preliminary hazards list, providing a framework for the group to evaluate which hazards were truly relevant to the City of Calistoga and which ones were not.

The internal planning group then ranked hazards based on their probability of affecting City of Calistoga and potential impacts on the community. Figure 2-10 displays the results of the hazard risk ranking exercise that was performed before further refinement. All hazards have been profiled in Volume 1 of this document. The purpose of this annex is to specifically address the city's vulnerability to specifically identified hazards.

Table 2-10: City of Calistoga Document Review of Potential Hazards

Hazard	2020 Napa County MJHMP	City of Calistoga General Plan	2023 California SHMP
Agricultural Pests	■		■
Avalanche			■
Climate Change	■	■	■
Coastal			■
Dam Failure	■		■
Drought	■	■	■
Earthquake / Liquefaction	■	■	■
Extreme Cold			■
Extreme Heat		■	■
Extreme Weather / Storms	■	■	■
Flood	■	■	■
Geologic / Mass Movement	■	■	■
Human-Caused			■
Insects			■
Levee Failure			■
Pandemic Disease	■		■
Sea Level Rise			■
Soil			■
Subsidence			■
Tornado			■
Tsunami / Seiche Wave			■
Volcano			■
Wildfire	■	■	■

Risk Assessment Matrix Definitions

PROBABILITY RATING

The likelihood of a hazard event occurring within a time period?

PROBABILITY

- **Highly Likely** - 100% annual probability. Or Likely to occur every year in your lifetime.
- **Likely** - between 10 & 100% annual probability. Or will occur several times in your lifetime.
- **Possible** - between 1 & 10% annual probability. Or Likely to occur some time in your lifetime.
- **Unlikely** - less than 1% annual probability. Or unlikely but possible to occur in your lifetime.

IMPACT RATING

In terms of injuries, damage, or death, would you anticipate impacts to be minor, limited, critical, or catastrophic when a significant hazard event occurs? The impact could be in terms of one hazard event (flooding from a culvert failure) or a large-scale event (multiple rivers flooding) in the same jurisdictional boundary.

IMPACT

Minor	Limited	Critical	Catastrophic

Minor - very few injuries, if any. Only minor property damage & minimal disruption on quality of life. Temporary shutdown of critical facilities.

Limited - minor injuries only. Approx. 10% or less of property in disaster footprint damaged or destroyed. Complete shutdown of critical facilities for more than one day.

Critical - multiple deaths/injuries possible. Between 25% and 50% of property in disaster footprint is damaged or destroyed. Complete shutdown of critical facilities for more than one week.

Catastrophic - high number of deaths/injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for 30 days or more.

To concentrate resources, the jurisdictional planning team will focus on "High" and "Extreme" risk hazards, and "Medium" risk hazards to a lesser extent. These hazards have the higher probability and greater impact as it relates to the jurisdictions planning area.

Hazard definitions are included in **Vol. 1** of this plan. Some hazards are discussed as subset hazards— e.g., "Levee Failure" within the "Flood" hazard profile. If a hazard is not present on the risk matrix, is grey, or categorized as a "Low" risk hazard, the jurisdictional planning team felt the hazard had a minimal footprint or impact within their planning area and chose not to profile the hazard.

Hazard Information / Legend:



Climate Change impacts will be addressed within each relevant hazard section within the plan update and as a stand alone section for each jurisdiction. Climate change may change the frequency, duration, or intensity of other hazards profiled.

City of Calistoga Risk Matrix

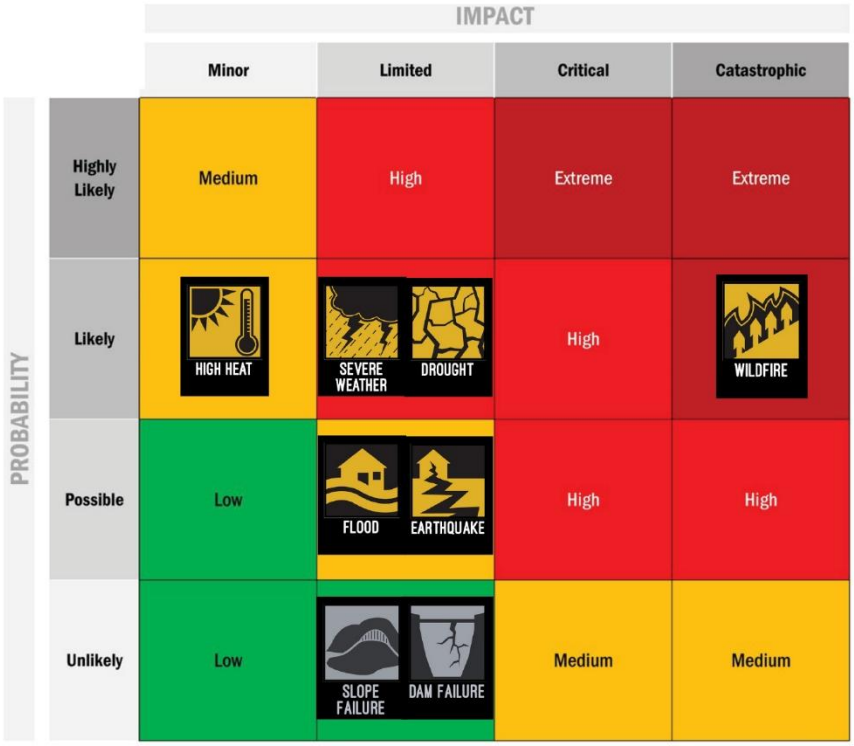


Figure 2-10: City of Calistoga Risk Assessment Matrix

Note: Hazard naming in the Risk Assessment Matrix may not match the final naming used. Refer to hazards prioritization summary table.

Priority Hazards

The results of the initial risk ranking exercise completed by the city's Planning Team, before further refinement, are identified in the county's completed matrix in Figure 2-10. Table 2-11 provides the final list of priority hazards and subhazards with additional details about why certain hazards were chosen and why others were not prioritized. However, it should be noted that many hazards not prioritized for profiling are briefly discussed as secondary or compounding hazards, and subhazards that were profiled and included in the risk assessment are listed specifically.

Table 2-11: City of Calistoga Hazards Prioritization Summary

Hazard	Priority	Explanation
Earthquake / Liquefaction	**Medium**	Profiled in Volume 1, Section 3.3.4, and Section 2.5.2.2 in this annex, including Liquefaction
Wildfire	**Extreme**	Profiled in Volume 1, Section 3.3.1, and Section 2.5.2.1 in this annex
Flood	**Medium**	Profiled in Volume 1, Section 3.3.2, and Section 2.5.2.3 in this annex, not including Levee Failure due to no exposure
Levee Failure	-	Profiled in Volume 1, Section 3.3.2; not a priority due to no exposure
Extreme Weather / Storms	**High**	Profiled in Volume 1, Section 3.3.5, and Section 2.5.2.6 in this annex as Severe Weather, including High Wind and Heavy Rain (Winter Weather not a priority due to low probability and impact potential)
Drought	**High**	Profiled in Volume 1, Section 3.3.6, and Section 2.5.2.4 in this annex
Geologic / Mass Movement	-	Profiled in Volume 1, Section 3.3.5; not a priority due to low probability and impact potential
Extreme Heat	**Medium**	Profiled in Volume 1, Section 3.3.8, and Section 2.5.2.5 in this annex
Agricultural Pests	**High**	Profiled in Volume 1, Section 3.3.9, and Section 2.5.2.7 in this annex under Climate Change as part of Agricultural Impacts
Sea Level Rise	-	Profiled in Volume 1, Section 3.3.9; not a priority due to no exposure
Climate Change	**High**	Profiled in Volume 1, Section 3.3.9, and Section 2.5.2.7 in this annex, including Agricultural Impacts, and discussed as a compounding hazard in relevant profiles
Dam Failure	-	Profiled in Volume 1, Section 3.3.3; not a priority due to low probability and impact potential

2.5.2 Vulnerability to Specific Hazards

Assessing vulnerabilities exposes the unique characteristics of individual hazards and begins the process of narrowing down which areas within the city are vulnerable to specific hazard events. The vulnerability assessment considered unique local knowledge of hazards and impacts and a GIS overlaying method for examining such vulnerabilities in more depth. Using these methods, the city's planning group estimated vulnerable populations, properties, and assets, and potential losses. In addition, the exposure of city assets to drought, geological, earthquake, wildfire and flood hazards were also considered.

Many of the hazard profiles include a snapshot map and damage estimation tables that illustrate the city's vulnerabilities to those specific hazards. These maps assisted the planning group in understanding the hazard exposure of populations, parcels, and critical facilities and infrastructure. Each snapshot map contains an exposure summary that displays the percentage of the population, the improvement and content value of parcels, and the amount of critical infrastructure that is exposed. For hazards without geospatial extents, such as drought and severe weather, narratives are provided instead of exposure maps and tables.

Based on the hazard prioritization exercise, this vulnerability assessment focuses on seven hazards for the City of Calistoga, some of which encompass sub hazards such as Liquefaction and Heavy Rain.

Wildfire
SECTION 0



Earthquake
SECTION 2.5.2.2



Flood
SECTION 2.5.2.3



Drought
SECTION 2.5.2.4



Extreme Heat
SECTION 2.5.2.4



Severe Weather
SECTION 2.5.2.6



Climate Change
SECTION 2.5.2.7



2.5.2.1 Wildfire Hazard

Wildfire risk in the City of Calistoga is primarily concentrated along the eastern and western edges of the community, where developed areas interface with open space, wetlands, and the Mayacamas Mountains and the Howell Mountains. The wildfire risk exposure map, Figure 2-11, shows that portions of the city and surrounding Sphere of Influence are located within Moderate, High, and Very High Fire Hazard Severity Zones, particularly in areas adjacent to undeveloped land and wildland vegetation.

The eastern boundary of Calistoga, which transitions into rolling hills and open space east of Highway 29 and near Silverado Trail, is characterized by Very High wildfire hazard. These areas contain dense vegetation on steep slopes that can dry rapidly during summer and fall months, increasing the potential for fast-moving fires under windy or extreme heat conditions. Residential neighborhoods, resorts, and wineries located near this wildland–urban interface (WUI) may face heightened risk related to ember intrusion, evacuation constraints, and access limitations during wildfire events. Exposure summaries indicate that approximately 700 residents, more than 250 parcels, nearly $242 million in building improvement value, and $131 million in content value fall within Very High Fire Hazard Severity Zones. However, over half of the total city population (about 2,700 people) live in Moderate to Very High zones.

More than 50% of the land within city limits is located within a Fire Hazard Severity Zone, with many residents, properties, and public assets exposed. As shown in Figure 2-11, population, parcel, and critical infrastructure exposure rates within Very High hazard zones are approximately 12%. This reflects Calistoga's relatively urbanized development pattern with extensive WUI areas in high-risk wildfire terrain surrounding the city core.

Wildfire risk and exposure are important planning considerations in Calistoga due to dense past development that extends into High and Very High hazard areas along the city edges, regional wildfire activity, and secondary impacts such as smoke exposure, power shutoffs, transportation disruptions, and evacuation demands. Increasing the threat of wildfire is the city's lack of water suppression due to aging pipes, lack of water system looping for redundancy, and pipe materials susceptible to fire. There is a great need to increase water delivery reliability for fire protection in these WUI areas.

Of particular concern in the WUI is Calistoga's growing senior population. As past wildfire evacuations over the last decade have demonstrated, growing mobility limitations among the aging population create additional challenges during a fast-moving event and warrant special attention in mitigation and emergency planning.

Climate change projections indicating hotter temperatures, longer dry seasons, and increased frequency of extreme weather events are expected to exacerbate wildfire conditions throughout Napa County, including areas surrounding Calistoga. To address Calistoga's future needs, a new Emergency Operations Center is needed. During past wildfire events, the city fairgrounds were used for sheltering and incident comment, including for the Valley Fire in 2015, the Tubbs Fire in 2017, and the Pickett Fire in 2025.

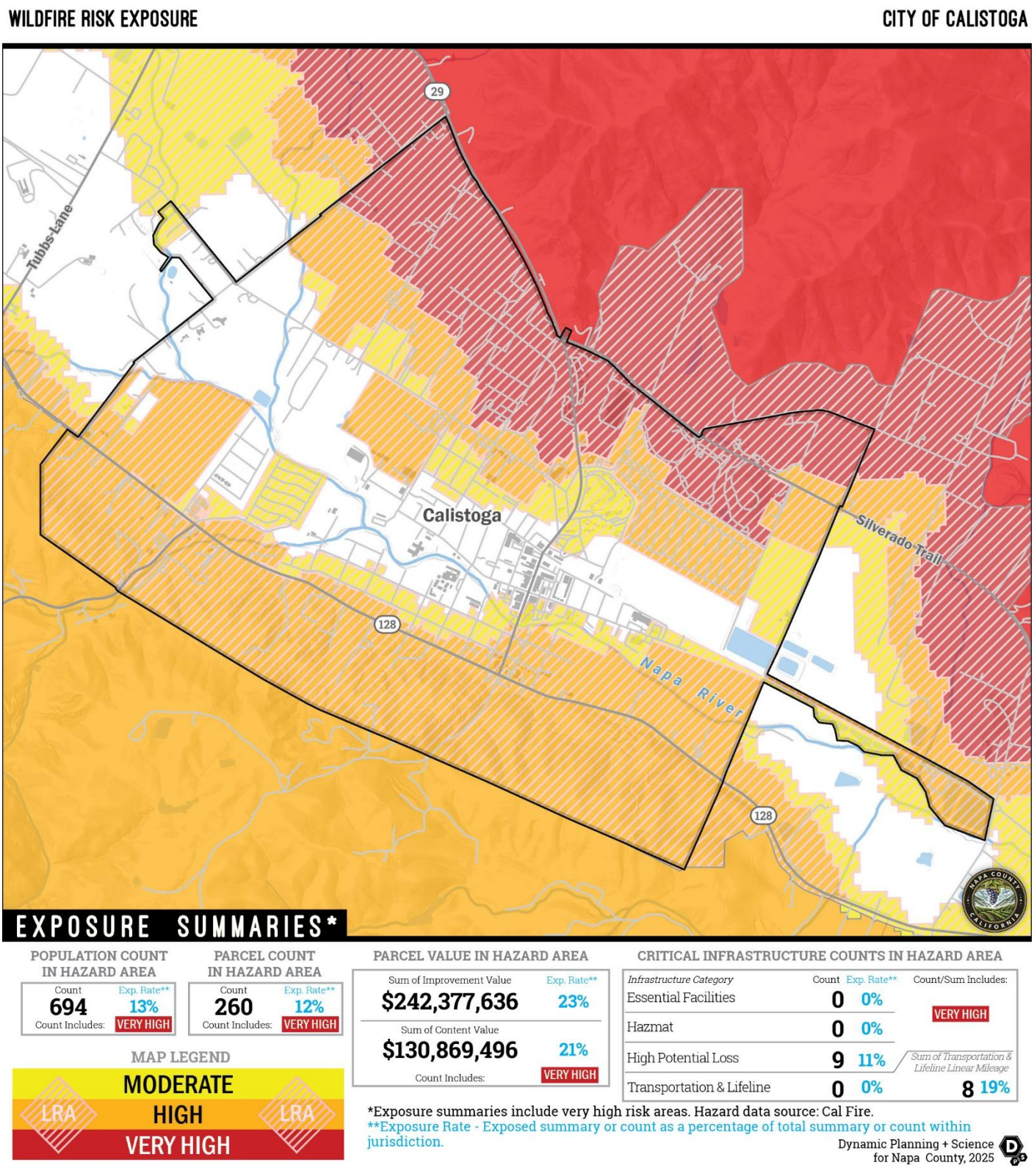


Figure 2-11: Exposure Summary – City of Calistoga Wildfire Risk

2.5.2.2 Earthquake Hazard

The City of Calistoga is subject to significant earthquake risk due to its location within the seismically active San Francisco Bay Area and proximity to multiple active faults in Napa County and the surrounding region. Earthquake impacts in the city are best illustrated through scenario modeling, including the Hunting Creek–Berryessa Earthquake Scenario (Magnitude 7.1) and the West Napa Earthquake Scenario (Magnitude 6.7). These scenarios reflect credible seismic events that could produce strong to severe ground shaking throughout the city.

Under the Hunting Creek–Berryessa M7.1 scenario (Figure 2-12), ground shaking across Calistoga is generally characterized as Strong (Modified Mercalli Intensity [MMI] VI). Exposure summaries indicate that approximately 300 residents, 200 parcels, nearly $78 million in building improvement value and $42 million in content value fall within these intensity ranges. In addition, all mapped critical infrastructure categories, including essential facilities, hazardous materials sites, high potential loss facilities, and transportation and lifeline systems, are exposed to damaging levels of ground shaking.

The West Napa Earthquake M6.7 scenario, Figure 2-13, represents a less impactful event for Calistoga. Under this scenario, 100 percent of the City's population, parcels, and assessed parcel value are exposed to Moderate to Strong (MMI V–VI). While exposure summaries indicate no population, parcels, or critical infrastructure located in the highest modeled intensity categories for this scenario within city limits, the widespread nature of strong shaking suggests the potential for damage to buildings, infrastructure, and lifelines, particularly older structures and non-ductile construction.

Earthquake impacts associated with these scenarios include structural damage to residential, commercial, and industrial buildings; failure of non-structural components; disruption of transportation corridors such as Highways 29, 128, and Silverado Trail; and damage to utilities including water, recycled water, wastewater, stormwater, power, and communications systems. Existing pipelines for wet utilities, in particular, are aging and made of brittle materials that are highly susceptible to breaks and leaks.

Secondary earthquake hazards also present a concern for Calistoga. These include hazardous materials releases from industrial and commercial facilities, fires following earthquakes, prolonged power outages, and limited access for emergency response due to damaged roadways or bridges. Given the city's strategic location in the upper Napa Valley, such disruptions could have regional economic and public safety consequences.

Liquefaction

Liquefaction represents a significant secondary earthquake hazard for the City of Calistoga due to local soil conditions, groundwater characteristics, and location on the Napa River (Figure 2-14). Liquefaction occurs when saturated, loose, fine-grained soils temporarily lose strength during intense ground shaking, causing the ground to behave more like a liquid. This phenomenon can result in ground settlement, lateral spreading, loss of bearing capacity, and damage to buildings, roadways, and buried utilities. While liquefaction is a

consideration in hazard mitigation planning, it is not profiled as a standalone hazard but addressed as a secondary earthquake effect.

Liquefaction can significantly amplify earthquake impacts by damaging lifeline infrastructure such as water, wastewater, storm drainage, gas, and telecommunications systems. Buried pipelines may rupture or become misaligned, roadways and bridges may settle or deform, and access routes needed for emergency response may be compromised. Commercial areas located on susceptible soils may face additional risks related to hazardous materials releases if tanks, pipelines, or containment systems are affected.

The earthquake scenario analyses for Calistoga indicate that strong to very strong ground shaking (MMI VII–VIII) is likely under credible seismic events. When combined with local liquefaction-prone soils, these shaking intensities increase the potential for widespread ground failure in susceptible areas. As a result, liquefaction poses a threat not only to individual structures but also to the city's broader functionality and recovery following a major earthquake.

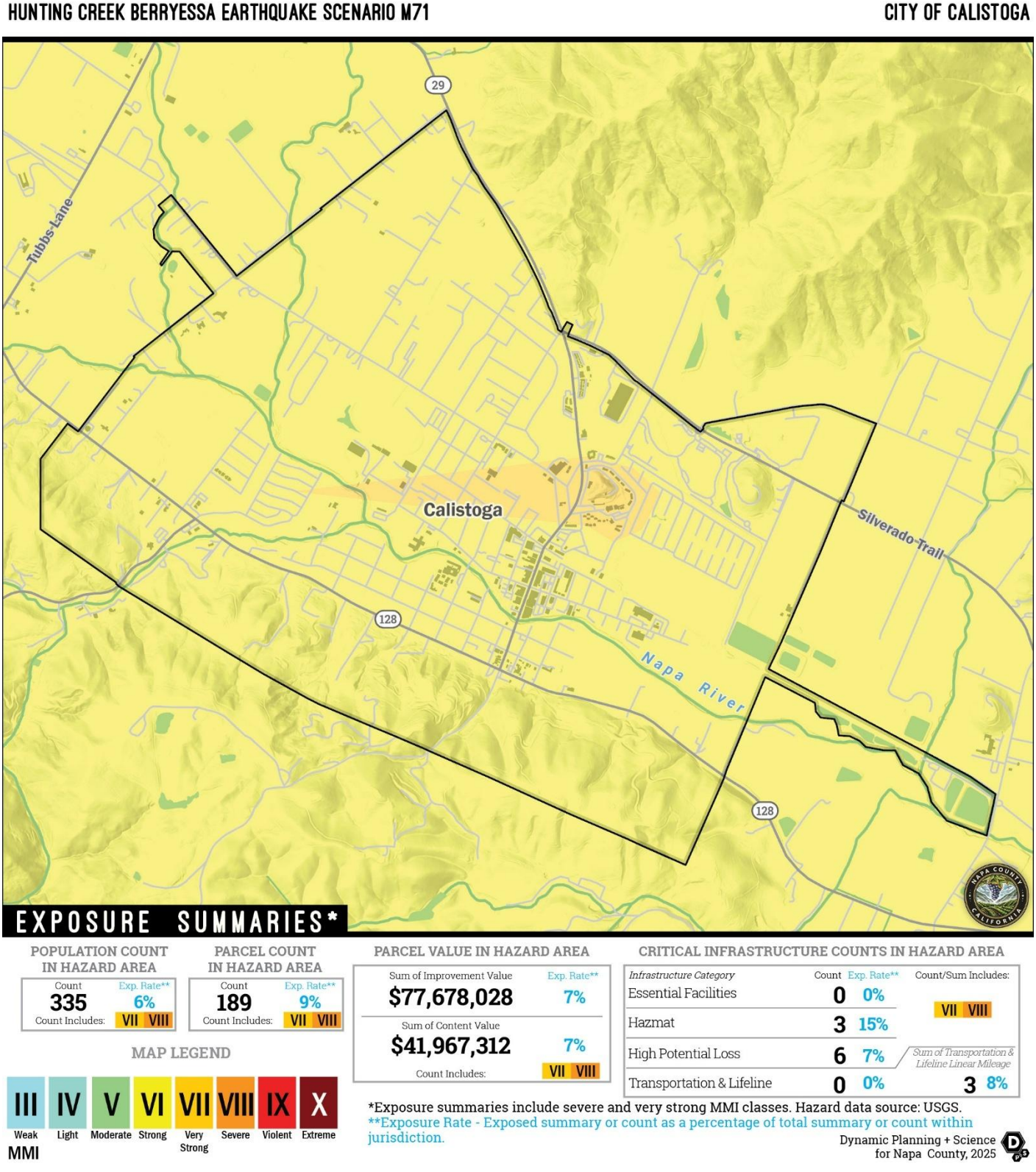


Figure 2-12: Exposure Summary – City of Calistoga Earthquake Risk (M7.1 Hunting Creek–Berryessa)

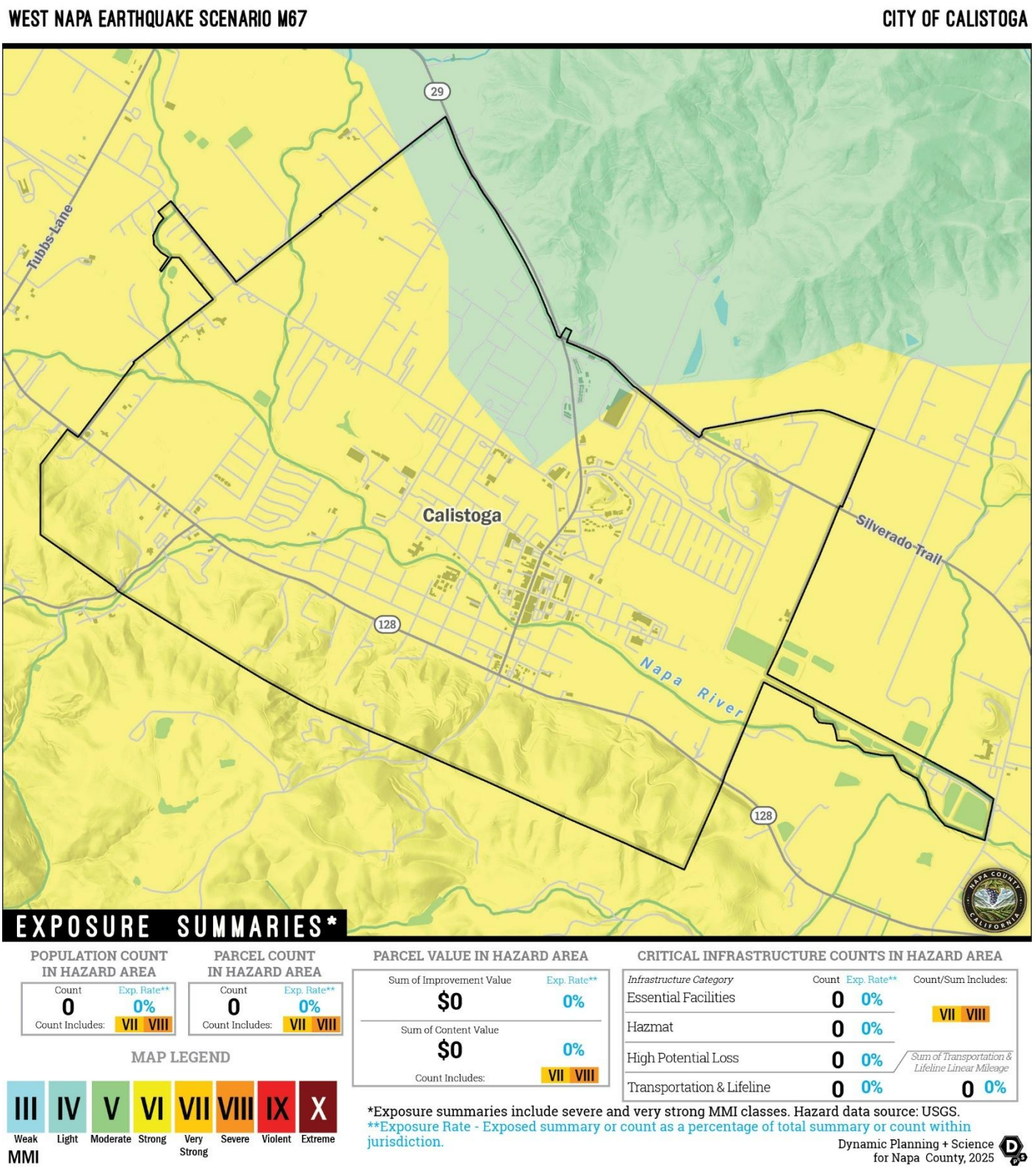


Figure 2-13: Exposure Summary – City of Calistoga Earthquake Risk (M6.7 West Napa)

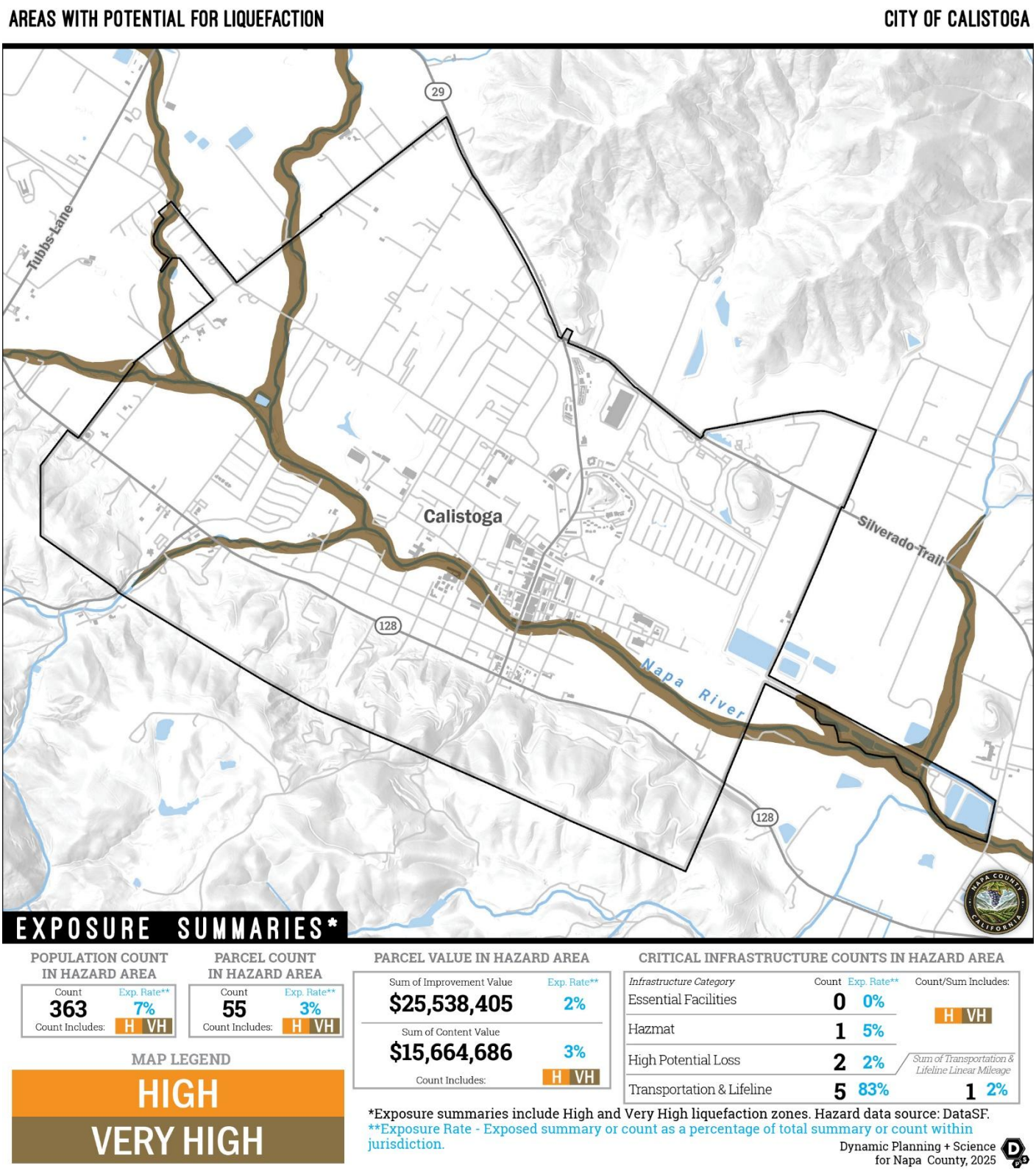


Figure 2-14: City of Calistoga Liquefaction Risk

2.5.2.3 Flood Hazard

Flooding is a significant natural hazard for the City of Calistoga due to its location on the Napa River. Portions of the City are subject to riverine flooding during major precipitation events. Flood hazard areas within Calistoga are concentrated along the Napa River.

The FEMA Flood Risk Exposure map, Figure 2-16, shows areas within the 100-year (1% annual chance) and 500-year (0.2% annual chance) floodplains, including mapped floodway areas. There are no areas in the city protected by levee. These flood-prone areas reflect the combined influence of river overflow and constrained drainage capacity. Flood hazards in these areas may be exacerbated during extreme storm events when high river flows coincide with elevated bay water levels.

Exposure analysis indicates that about 1,300 residents, 150 parcels, $90 million in building improvement value, and $51 million in contents value are at risk of flooding. While no hazardous materials sites are located within the mapped flood hazard areas, several transportation and lifeline facilities intersect flood-prone zones and the city's wastewater treatment plant is located in the FEMA Regulatory Floodway, highlighting the potential for access disruptions and service interruptions during flood events.

Flooding in Calistoga can result in structural damage to buildings, roadway inundation, utility system impacts, and long-term economic disruption. Repetitive or prolonged flooding may also affect industrial and commercial areas near the river, compounding recovery challenges. Secondary impacts include erosion and sediment deposition. A severe flood could damage bridges, water, wastewater, recycled water, and storm drainage facilities. The city has 40 plus critical facilities and 10 miles of wet utilities located in flood hazard areas. Old, aging infrastructure that is highly susceptible to flood damage and in need of replacement is a significant threat to the community.

Climate change is expected to increase flood risk in Calistoga over time. More intense precipitation events, may expand flood extents, increase flood depths, and reduce the effectiveness of existing drainage systems. Areas currently mapped within the 500-year floodplain may experience more frequent flooding in the future, increasing exposure to residents, infrastructure, and economic assets.

National Flood Insurance Program

The National Flood Insurance Program (NFIP) makes federally backed flood insurance available to homeowners, renters, and business owners in participating communities. FEMA has prepared a detailed Flood Insurance Study (FIS) for Napa County and municipalities. The study presents water surface elevations for floods of various magnitudes, including the 1% annual chance flood (100-YR flood) and the 0.2% annual chance flood (500-YR flood). Base flood elevations and the boundaries of the 100- and 500-YR floodplains are shown on Flood Insurance Rate Maps (FIRMs), which are the principal tools for identifying the extent and location of the flood hazard. FIRMs are the most detailed and consistent data source available, and for many communities they represent the minimum area of oversight under their floodplain management program. See Section 4 of Volume 1 for general information on the NFIP.

The City of Calistoga has participated in the NFIP since 1979 and has adopted the most recent FIRMs and FIS issued by FEMA (dated September 26, 2008) as well as local floodplain development regulations in compliance with the minimum NFIP standards (Calistoga Municipal Code Title 18). These minimum standards include procedures and provisions for substantial improvements and substantial damages to existing structures, the latter of which are employed by the floodplain administrator and city building inspectors following any hazard event affecting structures located in the flood hazard area in accordance with NFIP requirements. Regulations for substantial improvements are enforced via permitting procedures. Implementation and enforcement of the city's floodplain regulations are assigned to the Floodplain Administrator.

The City of Calistoga is currently in good standing with the provisions of the NFIP. Compliance is monitored by FEMA regional staff and by the California Department of Water Resources under a contract with FEMA. Maintaining compliance under the NFIP is an important component of flood risk reduction. See Table 2-12 for more information on the City's policies and historic flood insurance claims.

Table 2-12: City of Calistoga National Flood Insurance Program Information

City of Calistoga NFIP Status and Flood Insurance Statistics	
NFIP Status	Participating Since 9/28/1979
Community Identification (CID)	060206
CRS Class (Entry Date)	N/A
Policies in Force (Total Coverage)	63 ($21,931,000 in Coverage)
Policies Inside SFHA / Outside SFHA	43 Inside / 20 Outside
Policies in Coastal Zones (Total Coverage)	N/A
Total Claims (Total Paid)	16 Claims ($43,434 Paid)
Repetitive Loss (RL) / Severe Repetitive Loss (SRL) Properties	No RL or SRL Properties
Repetitive Loss Payments	No RL Payments

Note: The number of policies is by property and does not count policies for individual buildings. The Privacy Act of 1974 (5 USC 522a) restricts the release of certain types of data to the public. Flood insurance policy and claims data is included in the list of restricted information. FEMA can only release such data to state and local governments, and only if the data is used for floodplain management, mitigation, or research purposes. Therefore, this plan does not identify the repetitive loss properties or include claims data for any individual property.

Principal Flooding Sources

The principal flooding source for the City of Calistoga is the Napa River. Riverine flooding from the Napa River is the primary driver of mapped flood risk in Calistoga. During major storm events, high river flows can overtop banks or exceed channel capacity, particularly where development and infrastructure are adjacent to the river.

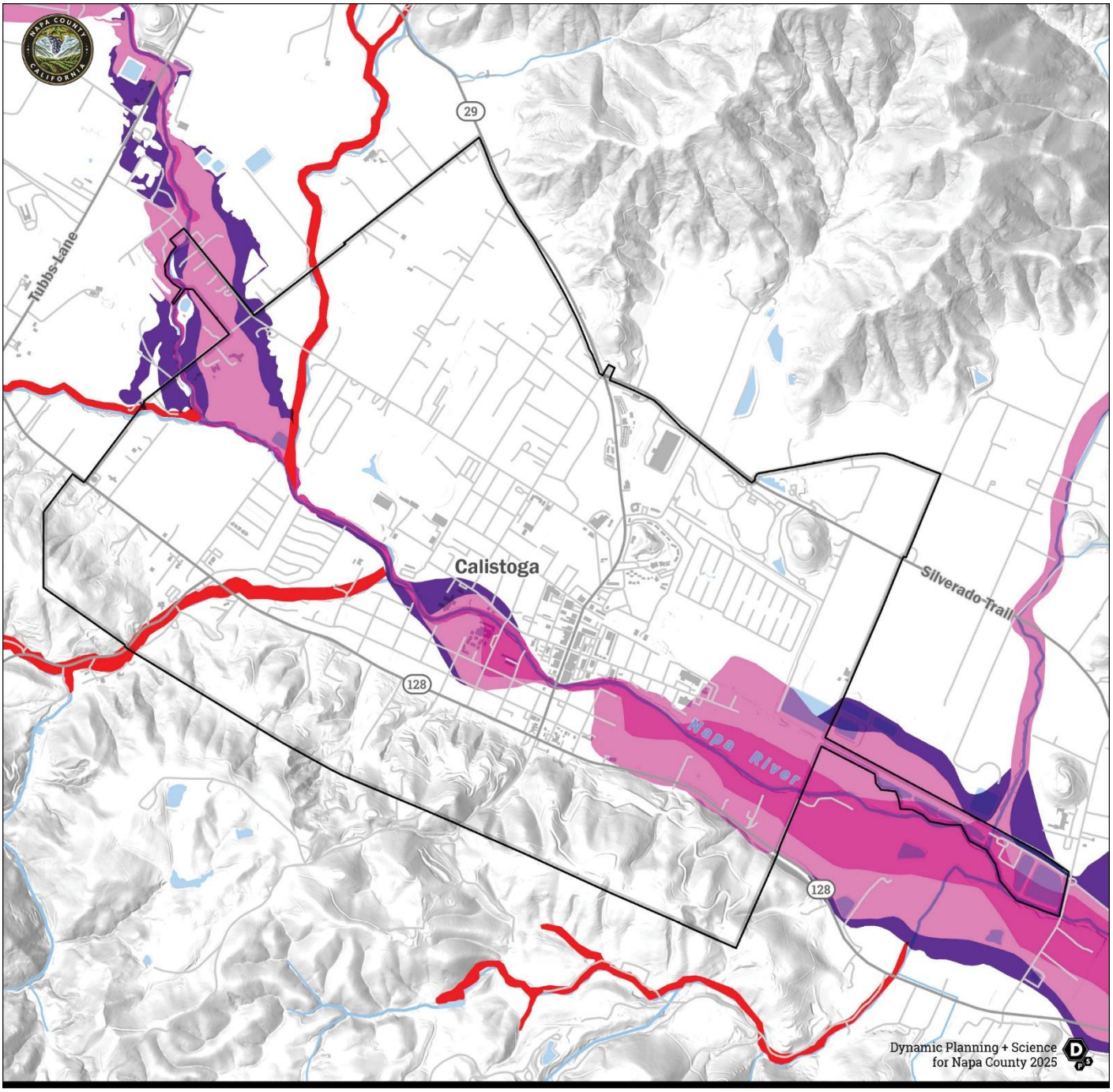
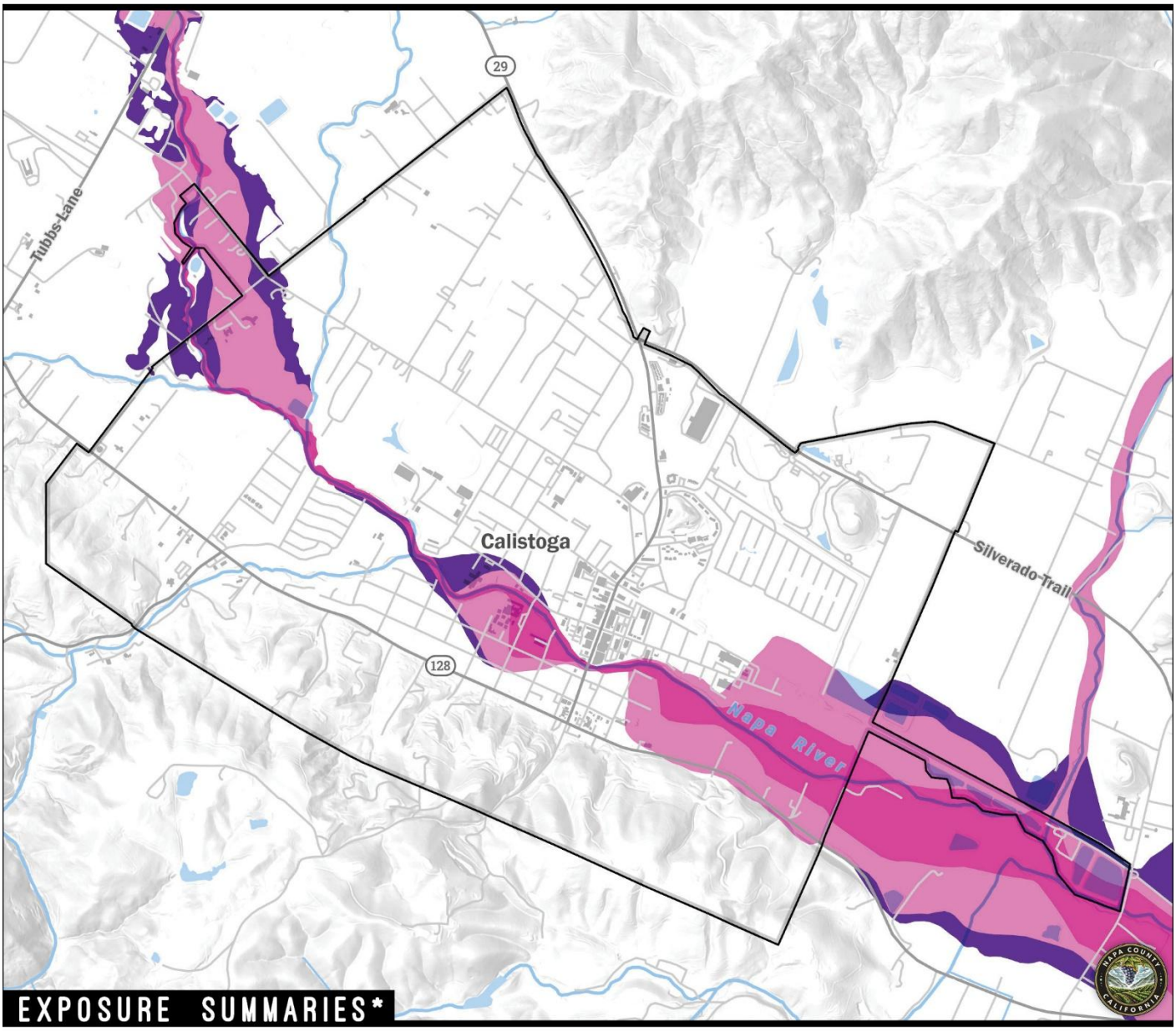


Figure 2-15: City of Calistoga Flood Risk (FEMA Zones and DWR Awareness Zones)

FEMA FLOOD RISK EXPOSURE

CITY OF CALISTOGA



EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA

Count	Exp. Rate**
1,138	22%

Count Includes: 100 + 500

PARCEL COUNT IN HAZARD AREA

Count	Exp. Rate**
136	6%

Count Includes: 100 + 500

PARCEL VALUE IN HAZARD AREA

	Exp. Rate**
Sum of Improvement Value: $89,884,069	8%
Sum of Content Value: $50,579,404	8%

Count Includes: 100 + 500

CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA

Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
Essential Facilities	0	0%	100 + 500
Hazmat	2	10%	
High Potential Loss	17	20%	Sum of Transportation & Lifeline Linear Mileage
Transportation & Lifeline	3	50%	4 10%

MAP LEGEND

100YR
FLOODWAY
LEVEE
500YR

*Exposure summaries include 100-year and 500-year flood zone areas. Hazard data source: FEMA.
**Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

Dynamic Planning + Science for Napa County, 2025

Figure 2-16: Exposure Summary – City of Calistoga Flood Risk (FEMA Zones)

2.5.2.4 Drought Hazard

The National Drought Monitor provides drought data and maps nationally and on a localized, watershed scale. The National Drought Monitor is the product of 11 agencies, including the NDMC, NOAA and USDA, and is available at http://droughtmonitor.unl.edu/. The National Drought Monitor categorizes the level of drought from D0 through D4, with D4 being the highest "exceptional drought." Table 2-13 depicts drought classifications and impacts from the level of drought occurrence in California, while Figure 2-17 shows a time series of the level of drought in Napa County from 2000 to 2025 according to the National Drought Monitor.

Drought is a recurring and long-term hazard for the City of Calistoga due to California's Mediterranean climate, variable precipitation patterns, and increasing impacts from climate change. Periods of prolonged below-average rainfall, reduced snowpack in the Sierra Nevada, and higher temperatures can significantly affect regional water supplies, ecosystems, and community resilience. Although drought does not typically cause immediate physical damage like other hazards, its cumulative impacts can be widespread and long-lasting.

Calistoga relies on a combination of surface water and imported water supplies that are vulnerable to regional drought conditions. Extended drought periods can reduce available water supplies, increase demand during hotter and drier conditions, and place stress on water delivery systems. Drought conditions may also require implementation of mandatory water conservation measures, affecting residents, businesses, landscaping, and industrial operations and increasing their cost in water.

Drought can exacerbate other natural hazards affecting Calistoga. Dry conditions increase vegetation stress and fuel loads, elevating wildfire risk in surrounding grasslands and open space areas. Reduced soil moisture can also contribute to land subsidence, soil instability, and increased erosion during subsequent storm events. In addition, drought can degrade wetlands and riparian habitats along the Napa River and bayfront, reducing their natural flood attenuation and ecological functions.

Economic impacts of drought may include increased operational costs for businesses, reduced agricultural productivity in the surrounding region, and higher household expenses related to water use restrictions or rate adjustments. Vulnerable populations, including low-income households and elderly residents, may be disproportionately affected by higher utility costs and reduced access to cooling and water resources during extreme heat events associated with drought.

Climate change projections indicate that drought conditions in California are likely to become more frequent and severe, with longer dry periods punctuated by fewer but more intense storm events. These trends increase uncertainty in water supply reliability and place additional importance on long-term water resource planning, conservation, and resilience measures. For future drought resilience, there is a for Calistoga to increase its reservoir storage capacities, find additional water supplies for sustained drought emergencies, and to improve water supply delivery systems to make them more reliable.

Table 2-13: Drought Classifications and Impacts

Category	Description	Possible Impacts
D0	Abnormally Dry	▪ Soil is dry; irrigation delivery begins early ▪ Dryland crop germination is stunted ▪ Active fire season begins
D1	Moderate Drought	▪ Dryland pasture growth is stunted; producers give supplemental feed to cattle ▪ Landscaping and gardens need irrigation earlier; wildlife patterns begin to change ▪ Stock ponds and creeks are lower than usual
D2	Severe Drought	▪ Producers increase water efficiency methods and drought-resistant crops ▪ Grazing land inadequate ▪ Fire season is longer, with high burn intensity, dry fuels, and large fire spatial extent, more fire crews on staff ▪ Lake- and river-based tourism declines; boat ramps close ▪ Trees are stressed; plants increase reproductive mechanisms; wildlife diseases increase ▪ Water temperatures increase; programs to divert water to protect fish begin ▪ River flows decrease; reservoir levels are low and banks are exposed
D3	Extreme Drought	▪ Federal water is not adequate to meet irrigation contracts; extracting supplemental groundwater is expensive ▪ Fire season lasts year-round; fires occur in typically wet parts of the state; burn bans are implemented ▪ Ski and rafting business are low; mountain communities suffer ▪ Low water levels impede fish migration and cause lower survival rates ▪ Wildlife encroaches on developed areas; little native food and water is available for bears, which hibernate less ▪ Water sanitation is a concern; reservoir levels drop significantly; surface water is nearly dry; flows are very low; water theft occurs ▪ Livestock need supplemental feed, cattle and horses are sold; little pasture remains ▪ Well and aquifer levels decrease; homeowners drill new wells
D4	Exceptional Drought	▪ Fire season is very costly; number of fires and areas burned are extensive ▪ Many recreational activities are affected ▪ Fields are left fallow; orchards are removed; vegetable yields are low; honey harvest is small; agricultural unemployment is high, food aid is needed ▪ Fish rescue and relocation begin; pine beetle infestation occurs; forest mortality is high; wetlands dry up; wildlife death is widespread; algae blooms appear ▪ Poor air quality affects health: greenhouse gas emissions increase as hydropower production decreases; West Nile outbreaks rise ▪ Water shortages are widespread; surface water is depleted; federal irrigation water deliveries are curtailed; water prices are extremely high; wells are dry, more and deeper wells are drilled; water quality is poor

Source: Adapted from U.S. Drought Monitor Drought Classifications and Impacts

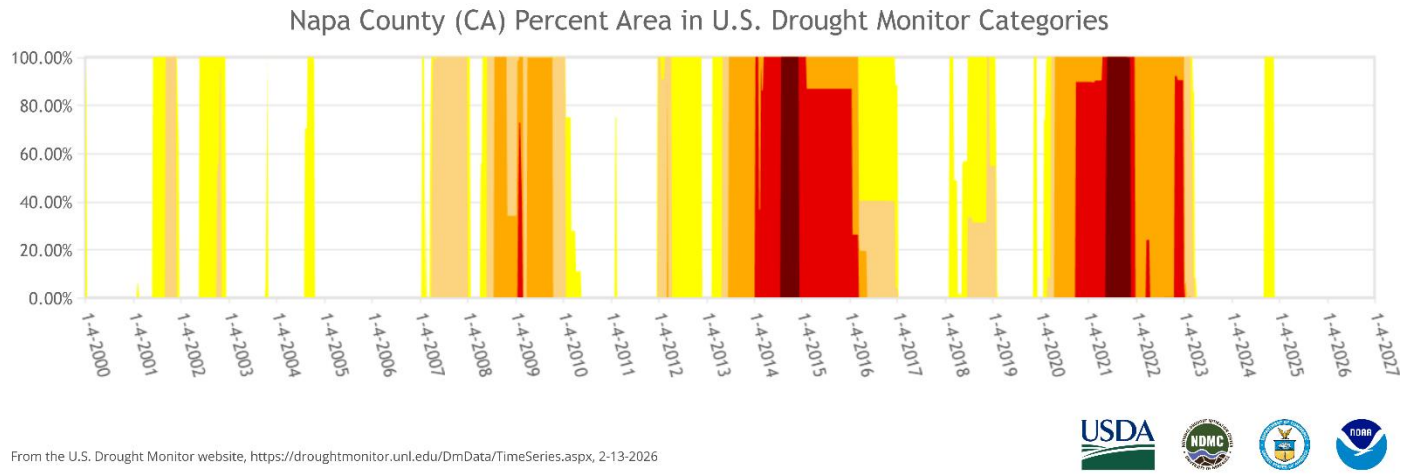


Figure 2-17: Drought Severity Timeline 2000-2024

2.5.2.5 Extreme Heat Hazard

Calistoga's inland valley location and reliance on outdoor agricultural labor make it particularly sensitive to rising temperatures and more frequent extreme heat days. Climate change is projected to increase both the frequency and intensity of heat waves in the region, posing growing risks to public health, agriculture, and infrastructure.

Heat waves are becoming more common across California, with projections showing a significant rise in the number of extreme heat days by mid-century. According to Cal-Adapt, Calistoga will likely experience a climate change-driven increase in extreme heat days above 101.2°F from four days per year to 21 days per year by the end of the century under a medium emissions scenario (RCP 4.5). Over the same time period, the city is also likely to see an increase in warm nights above 60.1°F from four per year to 39.

In Calistoga, outdoor workers face elevated risks during extreme heat events, particularly those without access to shaded rest areas, cooling stations, or protective equipment. Seniors, low-income residents, and individuals in older housing stock without air conditioning are also especially vulnerable to heat-related illness and may lack transportation to reach cooling centers.

The city's population exposure is compounded by socioeconomic factors. Many households in Calistoga are cost-burdened and lack adaptive measures such as air conditioning or urban tree canopy coverage, increasing health risks during prolonged heat events. This mirrors statewide findings that low-income and minority populations are disproportionately affected by extreme heat. Additionally, the city is more vulnerable to unplanned electrical outages during peak usage times.

As mentioned in Section 2.2.2, Calistoga is considered an Equity Priority Community by the Metro Transit Commission due in large part to its high senior population. Senior populations are at a much higher risk of heat related illnesses and an increased risk of death. Additionally, many seniors who are living in mobile

home parks experience significant impacts of high heat. Emergency managers should consideration senior mobility to cooling centers and funding and distribution of generators.

The frequency of extreme heat days is projected to rise significantly across inland Napa County by mid-century. For Calistoga, this means disproportionate impacts on agricultural workers in the Napa Valley as well as low-income neighborhoods with limited adaptive capacity. By the end of the century, the number of warm nights—when temperatures remain elevated and prevent recovery from daytime heat—is also projected to increase dramatically.

Extreme heat often coincides with elevated wildfire risk, reduced air quality from ozone and particulates, and public safety power shutoffs designed to prevent utility-caused ignitions. These secondary hazards can compound vulnerabilities by cutting access to cooling or disrupting medical care reliant on electricity.

2.5.2.6 Severe Weather Hazard

Severe storms are a recurring hazard in Calistoga, typically driven by high winds, heavy rainfall, and atmospheric river events during the winter months. While tornadoes, hail, and snow are rare in the region, severe storm impacts can be significant due to the city's vulnerable infrastructure, older housing stock, and concentrations of at-risk populations.

Residents in mobile homes and older housing, many of whom are low-income or elderly, are particularly vulnerable during storm events. These households face heightened risks from power outages, mobility limitations, and health impacts during prolonged high-wind or heavy-rain events.

High winds frequently cause downed trees and power lines in and around Calistoga, leading to widespread power outages, communication disruptions, and blocked roadways. Such conditions strain emergency response capabilities, delay evacuations, and exacerbate challenges for dependent populations.

Heavy rainfall during atmospheric river events can overwhelm Calistoga's aging stormwater infrastructure, especially in older downtown areas and low-lying neighborhoods near culverts and sloughs. These localized flash floods result in hazardous road conditions, temporary isolation of neighborhoods, and damage to property and infrastructure.

Severe storm frequency and intensity are projected to increase because of climate change. Calistoga already faces winter storms and recurring atmospheric rivers, which are contributing to repeated road closures, localized flooding, and long-term infrastructure strain. Climate-driven changes to storm severity highlight the city's continued vulnerability to cascading hazards, including flooding and slope instability along the slough system.

While severe storms in Calistoga may not produce catastrophic destruction, their compounding effects on vulnerable populations, lifeline infrastructure, and mobility make them a critical hazard for ongoing mitigation planning. Strategies to reduce risk should prioritize hardening power and drainage systems, enhance stormwater infrastructure, and develop targeted preparedness and response measures that reach the city's most at-risk residents.

2.5.2.7 Climate Change Hazard

Average annual temperatures across most of California have already increased by more than 1°F, with some areas experiencing rises of over 2°F when comparing the 1901 to 1960 average to that of 1986 to 2016. Daily maximum temperatures—a key indicator of extreme heat—are projected to increase by 4.4°F to 5.8°F by 2050 and by 5.6°F to 8.8°F by 2100. Heat waves that impact public health, known as heat-health events, are also expected to intensify across the state. By 2050, these events are projected to last up to two weeks longer in the Central Valley and occur four to ten times more often in the Northern Sierra region (California Natural Resources Agency, 2022).

California is already experiencing significant impacts from climate change, including prolonged drought, a lengthened wildfire season, increased coastal flooding and erosion, increased impacts from severe weather events including high winds, and widespread tree mortality. The state has observed rising average temperatures, more extreme heat days, fewer cold nights, a longer growing season, and shifts in the water cycle, with less winter precipitation falling as snow. In addition, summertime fog has declined by approximately 33%, and both snowmelt and rainwater runoff are occurring earlier in the year (Cal OES, 2018).

Long-term trends indicate a 12% to 20% decline in fog across California from 1900 through projections to 2070. Climate experts suggest that warming temperatures reduce the ability of air masses to cool enough to produce fog, which plays a critical role in supporting California's ecosystems (Grantham, Teodore; University of California, Berkeley, 2018).

The City of Calistoga is increasingly vulnerable to the long-term impacts of climate change, which function as hazard multipliers across the Napa Valley and broader North Bay region. Calistoga's location near the San Pablo Bay and surrounding upland areas, creates a complex climate setting that is sensitive to shifts in temperature, precipitation patterns, and seasonal variability. Projected changes in these conditions are expected to intensify existing hazards, including flooding, drought, extreme heat, and wildfire.

While marine influences can moderate temperatures at times, these effects may be reduced during offshore wind conditions or prolonged high-pressure systems, allowing heat to build across the area. As temperatures continue to rise, the frequency and duration of extreme heat events are expected to increase, placing additional stress on vulnerable populations such as older adults, children, outdoor workers, and residents without access to adequate cooling. Increased heat also drives higher energy demand, placing strain on the electrical grid and increasing the likelihood of service disruptions.

Agricultural Impacts

The local agricultural and wine industry and related businesses provide an annual economic impact of more than $11.7 billion locally and nearly $36.7 billion nationwide, with Calistoga and the surrounding unincorporated areas being an important production area in the Napa Valley. According to a 2012 California Energy Commission report "Vulnerability and Adaptation to Climate Change in California Agriculture", change in climate can directly impact crop growth through new temperature and precipitation patterns and northward shifts of pests and disease. Wildfire is also a major threat to agriculture in the Napa Valley.

A significant exotic pest infestation could affect everyone in the county, through the loss of markets for farm products, increased pesticide usage and production costs. (Pests & Diseases, n.d.) If left unchecked, these pests can cause millions of dollars of damage to agriculture and trigger an increase in pesticide usage within the county. The Napa County Agricultural Commissioner's Office is concerned about the introduction of new, exotic and destructive organisms. (Napa Dep't of Ag./ Sealer of Weights & Measures, 2017)

The most significant secondary hazard associated with an agriculture disaster is wildfire. Severe infestation of pests and disease in agricultural lands can cause crops to die, creating increased fuel for wildfire. Agricultural lands are open areas with a mix of grasses, shrubs, trees, and crops that, if dried out or dead, could easily ignite and either start or contribute to wildfire.

2.5.3 Climate Change Impacts & Vulnerable Populations

Climate change is expected to exacerbate many of the natural hazards affecting the City of Calistoga, increasing risks to populations that already face social, economic, or physical vulnerabilities. Rising temperatures, more extreme precipitation events, prolonged drought, sea level rise, and increased frequency of extreme heat are projected to intensify existing hazard conditions and create new challenges for public health, safety, and emergency response.

Certain populations in Calistoga are more likely to experience disproportionate impacts from climate-related hazards. Older adults, individuals with disabilities, low-income households, renters, and households with limited English proficiency may have reduced capacity to prepare for, respond to, and recover from climate-driven events. These groups may face barriers related to mobility, access to transportation, financial resources, housing stability, or timely access to emergency information.

Extreme heat presents a growing risk to vulnerable populations, particularly elderly residents, individuals with underlying health conditions, outdoor workers, and households without adequate cooling. Heat waves can increase the incidence of heat-related illness, strain electrical systems, and worsen air quality, especially when combined with wildfire smoke. Low-income households may be less able to afford cooling costs or make energy-efficient upgrades, increasing exposure during prolonged heat events.

Flooding and disproportionately affect residents and workers in low-lying areas near the Napa River. Vulnerable populations living or working in these areas may face greater risk of displacement, property damage, and disruption of access to essential services. Flood events can also impact transportation routes and utilities, creating additional challenges for individuals who rely on public transit, medical equipment, or nearby services.

Drought and water scarcity can place added burdens on vulnerable populations by increasing utility costs, limiting access to cooling and landscaping, and reducing the resilience of natural systems that provide flood protection and cooling benefits. For low-income households and fixed-income seniors, increased water and energy costs associated with drought and heat can compound financial stress.

Climate change may also increase the frequency and duration of poor air quality events, particularly from regional wildfires. Individuals with respiratory conditions, older adults, children, and outdoor workers are especially sensitive to smoke exposure. Limited access to air filtration, clean indoor environments, or protective equipment can further increase health risks for vulnerable populations.

2.5.4 Hazard Problem Statements

As part of the mitigation action identification process, the Planning Team for each jurisdiction identified areas of concern (aka problem statements) for their respective facilities based on the risk assessment and vulnerability analysis, utilizing the RAMP mapping and static snapshot maps. Problem statements focused on the impact, victim, or threat that the hazard could create in the jurisdiction, as described in Table 2-14. Identifying common issues and weaknesses through these problem statements assisted the planning group in understanding the realm of resources needed for mitigation.

The goal is to have at least one mitigation action for every problem statement. Projects or actions have been developed to mitigate each problem identified. See Table 2-16 for a full list of mitigation actions and corresponding problem statements that they address. Each problem statement is coded with a problem number for cross-referencing between Table 2-14 and Table 2-16

Table 2-14: City of Calistoga Hazard Problem Statements

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-CC-CL-13	Climate Change	Victim	**City of Calistoga**	Calistoga's vulnerable populations, including seniors, renters, and low-income families, face increased cumulative risk from intersecting climate change-driven hazards.	ma-CC-CL-11, ma-AH-CL-218, ma-CC-CL-219
ps-CC-CL-15	Climate Change	Threat	**City of Calistoga**	Climate projections show increasing frequency and intensity of hazards, including extreme heat, severe weather, drought, wildfire, and flood, that compound and cascade risk across sectors.	ma-CC-CL-11, ma-CC-CL-219
ps-CC-CL-324	Climate Change	Victim	**City of Calistoga**	The farms, vineyards, and other businesses that rely on Calistoga's tourism-based economy are heavily impacted by climate change-driven hazard events such as more extreme droughts, wildfires, and weather.	ma-CC-CL-219
ps-CC-CL-325	Climate Change	Impact	**City of Calistoga**	Climate change increases flood, wildfire, severe weather, and drought related hazard risks.	ma-CC-CL-219
ps-DR-CL-45	Drought	Threat	**City of Calistoga**	Prolonged drought threatens Calistoga's water supply and agricultural/tourism-based economy. The City's reliance on limited local sources makes it vulnerable to supply shortages and restrictions.	ma-DR-NCo-24, ma-DR-CL-220, ma-DR-CL-22
ps-DR-CL-46	Drought	Impact	**City of Calistoga**	Drought conditions exacerbate wildfire risk, decrease water quality, increase agricultural and groundwater demand, and stress vegetation.	ma-DR-CL-21, ma-DR-CL-22

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-DR-CL-320	Drought	Impact	**City of Calistoga**	Drought can cause reduced revenues from utility fees, higher costs to purchase additional supplies, state water restrictions, and associated impacts on tourism.	ma-DR-CL-220, ma-DR-CL-22
ps-DR-CL-321	Drought	Victim	**City of Calistoga**	Approximately 7,000 people served by City water are impacted when water restrictions are triggered by extended drought, especially agricultural operators.	ma-WF-CL-87, ma-CC-CL-219, ma-DR-CL-22, ma-DR-CL-220
ps-EQ-CL-66	Earthquake	Victim	**City of Calistoga**	All city residents live in areas with moderate-to-high seismic hazard risk and are potentially exposed to impacts from a major earthquake, including fire damage from broken gas lines.	ma-EQ-CL-34, ma-EQ-CL-35
ps-EQ-CL-67	Earthquake	Impact	**City of Calistoga**	A major earthquake could damage transportation routes and utilities, including aging water, sewer, recycle, and storm lines, critically impacting continuity of City services, challenging emergency response, and disrupting access routes.	ma-EQ-CL-34, ma-WF-CL-87
ps-EQ-CL-82	Earthquake	Threat	**City of Calistoga**	Calistoga is exposed to seismic hazard risk due to proximity to the West Napa and Hunting Creek Berryessa Faults, which are capable of producing M6.7+ earthquakes.	ma-EQ-CL-35, ma-AH-CL-218
ps-EQ-CL-322	Earthquake	Impact	**City of Calistoga**	A major earthquake could severely impact the city's economy, especially from lost tourism.	ma-EQ-CL-34, ma-EQ-CL-35
ps-FL-CL-108	Flood	Victim	**City of Calistoga**	There are many local businesses located in and approximately 1,300 people living in the 100- or 500-year FEMA floodplain which are exposed to potential flooding impacts.	ma-FL-CL-48, ma-FL-CL-50, ma-AH-CL-218
ps-FL-CL-111	Flood	Impact	**City of Calistoga**	There are over 40 critical facilities (including the fire station/EOC) and more than 10 miles of critical infrastructure located in the 100- or 500-year FEMA floodplain. A severe flood event could damage or destroy critical infrastructure such as streets, bridges, water and wastewater systems, or stormwater conveyance, and could potentially contaminate the City's water system and the environment.	ma-FL-CL-48, ma-FL-CL-50, ma-WF-CL-87
ps-FL-CL-319	Flood	Threat	**City of Calistoga**	Flood risk is expected to change due to increased rainfall intensity from climate change and changing river vegetation/management and environmental challenges maintaining waterways.	ma-CC-CL-219
ps-HH-CL-326	High Heat	Threat	**City of Calistoga**	The frequency of extreme heat days and warm nights is projected to rise significantly by mid-century, with disproportionate impacts on agricultural areas and low-income neighborhoods, and those considered Equity Priority Communities.	ma-AH-CL-218, ma-CC-CL-219
ps-HH-CL-327	High Heat	Victim	**City of Calistoga**	Seniors, socioeconomically disadvantaged households, and those living in mobile homes often do not have adequate air conditioning and are disproportionately impacted by extreme heat events.	ma-AH-CL-218

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-HH-CL-328	High Heat	Impact	**City of Calistoga**	Extreme heat events often cause power outages from high demand during peak hours, can trigger PSPS events, and exacerbate wildfire and drought risks.	ma-AH-CL-218, ma-AH-CL-3
ps-FL-CL-125	Severe Weather	Impact	**City of Calistoga**	Heavy rain events cause localized flooding and damage water, sewer, and recycling systems due to aging and undersized storm drainage infrastructure	ma-FL-CL-49, ma-WF-CL-87
ps-SW-CL-145	Severe Weather	Impact	**City of Calistoga**	High wind, heavy rain, and winter storm events increasingly disrupt utilities and transportation, including from downed trees and powerlines and localized flooding, resulting in blocked access and extended power outages.	ma-SW-NCo-81, ma-SW-NCo-82, ma-AH-CL-218, ma-WF-CL-87
ps-SW-CL-147	Severe Weather	Threat	**City of Calistoga**	Severe winds can damage electrical infrastructure, cause power outages, and spark or exacerbate wildfire conditions.	ma-SW-CL-79, ma-WF-CL-87
ps-SW-CL-323	Severe Weather	Victim	**City of Calistoga**	Seniors, socioeconomically disadvantaged households, and those living in mobile homes often do not have adequate heat and are disproportionately impacted by winter storms and low temperatures.	ma-AH-CL-218, ma-SW-CL-79
ps-WF-CL-179	Wildfire	Threat	**City of Calistoga**	Calistoga is exposed to high wildfire risk due to extensive WUI, fuels and topography on surrounding lands, and a local climate prone to fire weather conditions.	ma-WF-CL-87, ma-WF-CL-88, ma-WF-CL-89, ma-WF-NCo-90, ma-AH-CL-218, ma-WF-CL-221
ps-WF-CL-183	Wildfire	Victim	**City of Calistoga**	Over half of the population (approximately 3,000 residents) lives in High or Very High FHSZs and are at increased risk of direct wildfire impacts to safety and property while insurance cancellations and high premiums have increased.	ma-WF-CL-88, ma-WF-NCo-90, ma-AH-CL-218, ma-WF-CL-221
ps-WF-CL-184	Wildfire	Impact	**City of Calistoga**	A wildfire within or adjacent to City limits could cause loss of life, evacuations, destruction of property, and damage and disruption to critical facilities and infrastructure, in addition to business disruptions and reduced tourism.	ma-WF-CL-88, ma-AH-CL-3, ma-WF-CL-221
ps-WF-CL-317	Wildfire	Victim	**City of Calistoga**	Indirect impacts of wildfire, such as power shutoffs, smoke, and fire-related evacuations, disrupt tourism and affect local businesses.	ma-AH-CL-218, ma-AH-CL-3
ps-WF-CL-318	Wildfire	Threat	**City of Calistoga**	The city lacks adequate fire suppression capabilities due to aging pipes, dead ends in the system (not looped), infrastructure made with combustible materials, and inadequate back-up power.	ma-WF-CL-87, ma-AH-CL-3

2.6 Mitigation Strategy

This section provides the framework for how the City of Calistoga will reduce hazard risk within its jurisdiction while supporting the broader goals of the Napa County MJHMP. It includes an overview of existing capabilities, opportunities to strengthen resilience, and the city's prioritized mitigation actions. Together, these elements demonstrate how Calistoga integrates hazard awareness into its planning and development processes while contributing to a coordinated countywide approach.

Within the Napa County MJHMP, the mitigation strategy serves as the roadmap for future hazard mitigation efforts. For Calistoga, the strategy outlined in this annex reflects the outcomes of the countywide planning process while also addressing the city's unique risks, priorities, and community needs. The strategy is designed to reduce vulnerabilities identified in the risk assessment, including the problem statements developed for flooding, earthquakes and liquefaction, slope failure, wildfire, drought, severe storms, extreme heat, and climate change.

Mitigation actions identified in this annex include both policy-based and project-based initiatives, with an emphasis on integrating resilience into land use planning, infrastructure investments, and community programs. Actions are structured to align with FEMA's requirements and to coordinate with existing city, county, and regional planning mechanisms. Each action identifies responsible parties, potential funding sources, and the resources needed for implementation.

For Calistoga, this strategy provides a framework for strengthening resilience by combining city-led initiatives, such as infrastructure improvements, building code enforcement, and community preparedness, with regional coordination through the MJHMP. By advancing these efforts in alignment with the General Plan and other local planning documents, Calistoga enhances its ability to reduce hazard risk while supporting long-term community safety, sustainability, and economic stability.

The subsections that follow describe these elements in detail:

- **Sections 2.6.1, Capabilities and Opportunities,** provides a summary of the city's capacity to address natural hazards.
- **Section 2.6.2, Mitigation Action Plan,** presents Calistoga's prioritized actions to guide implementation in coordination with countywide strategies.
- **Section 2.6.3, Status of Previous Mitigation Actions,** provides a summary of all previous actions and their current status, whether completed, cancelled, or revised.

Aligning the Action Plan

This section connects Calistoga's mitigation actions with its existing capabilities and areas for growth. Capability assessments are a required element of hazard mitigation planning under the Disaster Mitigation Act of 2000 and FEMA's 2023 guidance, ensuring that actions are realistic, achievable, and aligned with available resources.

The section begins with a summary of Calistoga's capabilities across four areas: planning and regulatory, administrative and technical, fiscal, and education and outreach. This overview highlights the tools and strengths that the district already uses to reduce hazard risk. The section then provides a detailed analysis of each capability area, identifying both current practices and opportunities to expand resilience.

2.6.1 Capabilities & Opportunities

This section provides a detailed assessment of the city's current capabilities to support hazard mitigation, as well as future opportunities. This consists of describing how the city is planning for hazards and growth and a summary of its existing capabilities and the potential for enhancement.

2.6.1.1 Planning for Hazards & Growth

As a general law city, the City of Calistoga manages growth within the framework of California's comprehensive planning, zoning, subdivision, and environmental regulations. Much of the City's developable land has already been urbanized, and remaining growth is largely directed toward infill development, redevelopment, and planned buildout within the existing urban footprint. Calistoga is bisected by the Napa River with hillside terrain to the west and east, which constrains outward expansion and concentrates future development in areas already subject to natural hazards.

This development pattern places portions of the city's population, infrastructure, and economic assets within areas exposed to hazards such as wildfire in the city's extensive WUI areas, riverine and flooding along the Napa River, strong earthquake ground shaking and liquefaction, and extreme heat and drought conditions. Commercial areas near the river corridor and residential neighborhoods in low-lying areas are particularly sensitive to flooding and sea level rise, while hillside areas west and east of the city face localized risks related to slope instability and wildfire exposure.

Hazard vulnerability is addressed through coordination with the city's General Plan, particularly the Safety Element, which integrates hazard information into land use decisions, infrastructure planning, and development review. This approach ensures that growth and redevelopment consider site-specific risks and incorporate appropriate mitigation measures, such as flood-resilient design, geotechnical stabilization, and emergency access planning. Integration of hazard considerations into long-range planning also supports compliance with state and federal hazard mitigation requirements and strengthens the City's eligibility for disaster recovery and resilience funding.

Climate change is expected to intensify several of the hazards affecting Calistoga, including wildfire, flooding influenced by sea level rise, more extreme precipitation events, prolonged drought, and increasing extreme heat. As growth continues within constrained and hazard-exposed areas, resilience must be embedded into every phase of planning and development. Growth management in Calistoga therefore emphasizes sustainable building practices, water conservation, protection of natural floodplain functions, and climate-adaptive infrastructure, ensuring that future development and redevelopment reduce, rather than exacerbate, existing hazard risks and support long-term community resilience.

Long-Range Planning & Growth Management

Long-range planning and growth management policies play a central role in limiting hazard exposure in Calistoga. The city's General Plan establishes the overall land use pattern, directs growth toward areas that can be safely and efficiently served by infrastructure, and discourages development in areas subject to significant natural hazards where feasible.

Growth in Calistoga has largely occurred within an established urban footprint on the valley floor, with an emphasis on infill development, redevelopment, and planned expansion areas that are supported by existing transportation, utility, and emergency services. This approach helps reduce the need for development in hazard-prone areas such as floodplains, steep slopes, and wildfire-prone wildland–urban interface locations. Where development does occur near hazard areas, planning policies emphasize hazard-aware site design, infrastructure resilience, and emergency access.

Long-range planning efforts also account for future climate conditions, recognizing that sea level rise, extreme heat, drought, and more intense storm events may alter hazard profiles over time. Incorporating these considerations into growth management helps ensure that future development does not increase vulnerability or place undue strain on emergency response and public services.

Building Codes & Development Standards

Calistoga's development strategies combine comprehensive planning frameworks with robust regulatory measures to guide growth while reducing risks from natural hazards. Building codes play a central role in this approach. Nationally, continual improvements to building codes since 1990 have added only about one percent to construction costs while greatly improving disaster resilience. In California, building codes are among the most stringent in the world, setting minimum standards that safeguard against hazards such as earthquakes, flooding, wildfire, landslides, and severe weather. Calistoga enforces these standards locally, providing a strong foundation for resilient construction.

The city is required to regularly update its development regulations to reflect the California Building Code (CBC), which is revised every three years and was most recently updated in 2025. The CBC establishes some of the world's highest construction standards, ensuring occupant safety in the face of natural hazards. Climate change is also addressed through adoption and updating of the California Green Building Standards (CALGreen) and Energy Codes, which integrate energy efficiency, sustainable design, and climate adaptation measures. In addition, Calistoga participates in the National Flood Insurance Program (NFIP), requiring that all new development in designated flood hazard areas meet FEMA's minimum flood protection standards.

Through these building and development regulations, Calistoga ensures that new development in hazard-prone areas is either restricted or subject to strict hazard-mitigation requirements. Where development is allowed, codes emphasize reducing exposure and vulnerability through appropriate siting, advanced construction techniques, emergency access, and defensible space. For example, new construction in the

wildland–urban interface (WUI) must comply with fire-resistant building materials and vegetation management requirements under the California Fire Code.

Beyond code enforcement, Calistoga integrates these mandates into broader local planning frameworks, including the General Plan and HMP This alignment ensures that growth management, environmental review, and hazard mitigation strategies collectively address emerging risks from wildfire, drought, flooding, extreme heat, and severe weather intensified by climate change.

California Environmental Quality Act (CEQA) & Hazard Mitigation

The California Environmental Quality Act (CEQA) requires General Plans, Specific Plans, and major development projects to evaluate hazards such as flooding, seismic risk, and wildfire. Environmental documents must identify these risks and propose mitigation measures, which may include setbacks from hazard-prone areas, infrastructure upgrades, evacuation planning, or restrictions on development in high-risk zones.

Regional and state public safety planning frameworks that inform development review in Calistoga include the State Seismic Hazards Mapping Act, the California Environmental Quality Act (CEQA) and its Guidelines, California Noise Insulation Standards (Title 24), and the Federal Emergency Management Agency (FEMA) Flood Insurance Program. Together, these programs establish requirements for evaluating and mitigating environmental and hazard-related impacts associated with development.

Under CEQA, residential projects that require discretionary approval from the city are subject to environmental review concurrently with the approval process. While CEQA review can add time to development and is therefore considered a potential constraint to housing production, much of Calistoga's remaining vacant and developable land has already undergone environmental review through Environmental Impact Reports (EIRs) prepared as part of adopted specific plans. These EIRs streamline subsequent project-level CEQA review by identifying environmental impacts and mitigation measures in advance, allowing later residential projects to tier from or rely on existing CEQA documents. Projects that deviate from the assumptions or scope of adopted specific plans may also tier from previously certified CEQA analyses, where appropriate.

Recent updates to CEQA standards have also changed how transportation and air quality impacts are evaluated. Transportation impacts are no longer assessed using Level of Service (LOS), which measured vehicle delay, but instead rely on Vehicle Miles Traveled (VMT) as the primary metric. This shift emphasizes reducing vehicle travel and associated emissions rather than roadway congestion.

In addition, updated Bay Area Air Quality Management District (BAAQMD) greenhouse gas (GHG) thresholds, adopted in April 2022, require changes to how GHG impacts are analyzed in CEQA documents. Under these standards, plans or projects within BAAQMD jurisdiction must either demonstrate consistency with an adopted, qualified local Climate Action Plan or incorporate specific project features, including all-electric buildings, a minimum reduction in VMT, and electric vehicle infrastructure meeting CalGreen Tier 2 requirements.

Although LOS is no longer used for CEQA compliance, the city continues to use LOS analysis as a non-CEQA planning tool to evaluate roadway operations, support infrastructure planning, and ensure that key transportation corridors function effectively and meet community expectations. Together, CEQA and related regulatory frameworks play a critical role in integrating hazard mitigation, climate adaptation, and sustainability considerations into development and long-range planning decisions in Calistoga.

By integrating hazard analysis into the development review process, CEQA helps ensure that future growth in Calistoga is designed with resilience and long-term community safety in mind.

2.6.1.2 Development & Hazard Considerations

Development in the City of Calistoga occurs within a physical and regulatory context shaped by natural hazards, environmental constraints, and long-term growth management policies. As a general law city operating under California planning and environmental regulations, Calistoga evaluates development proposals with consideration for hazard exposure, public safety, infrastructure capacity, and long-term resilience. This integrated approach helps ensure that new development and redevelopment do not increase risk to people, property, or critical systems.

Much of the city's remaining development potential lies within areas that are already urbanized or planned through adopted specific plans. As a result, development often occurs in proximity to known hazard areas, including floodplains along the Napa River, dam inundation zones, liquefaction-prone soils, and areas exposed to strong seismic shaking and extreme heat. Rather than avoiding development entirely in these locations, the city emphasizes risk-informed site planning, design, and construction standards to reduce vulnerability and limit potential impacts.

Flood hazards are addressed through enforcement of flood plain management regulations, participation in the National Flood Insurance Program, and incorporation of flood-resilient design measures for development in or near mapped flood hazard areas. These measures may include elevating structures, protecting utilities, maintaining flood conveyance, and avoiding critical facilities in the highest-risk locations. Development decisions also consider future flood conditions associated with sea level rise and more intense storm events.

Seismic hazards are a key consideration in development review due to the City's location within the seismically active San Francisco Bay Area. Projects are required to comply with state seismic design standards and, where appropriate, conduct site-specific geotechnical investigations to address ground shaking, liquefaction, and slope stability. These requirements help reduce structural damage and protect infrastructure during earthquake events.

Wildfire, slope failure, and extreme weather hazards are also considered during development review, particularly in areas identified as moderate, high, or very high fire hazard severity zones, and those near the eastern hills, open space, and transportation corridors. Development standards related to defensible space, access, drainage, and emergency response are used to minimize risk and support safe evacuation and emergency operations.

The CEQA provides a framework for identifying hazard-related impacts at the project level and requiring feasible mitigation measures. Through CEQA review, the city evaluates whether proposed development would expose people or structures to significant risks from natural hazards and ensures that appropriate avoidance, design, or mitigation measures are incorporated into project approvals.

2.6.1.3 Capabilities & Opportunities Assessment

To develop a realistic and actionable mitigation strategy, it must account for existing jurisdictional capabilities and what future opportunities there are to enhance those capabilities for purposes of hazard mitigation. This section provides an assessment of the City of Calistoga's existing capabilities and future opportunities, including planning and regulatory, administrative and technical, fiscal, and public outreach and education capabilities. This assessment also identifies opportunities to integrate this MJHMP into future planning, policies, or programs to weave mitigation efforts into daily operations and address hazard problems wholistically. Capabilities are categorized into four groups and include various mechanisms.

- **Planning and Regulatory Capabilities:** Existing long-range plans, emergency response plans, hazard-specific plans, land use policies, and building and development standards.
- **Administrative and Technical Capabilities:** Available expertise in emergency services, engineering, grant management, and community planning.
- **Fiscal Capabilities:** Budgetary capacity, taxing authority, grants, and other funding mechanisms that can support mitigation projects.
- **Outreach and Education Capabilities:** Existing programs for providing technical assistance, community education, public warnings, and stakeholder engagement.

A full description of the process used to develop the capabilities assessment is provided in Volume 1, Section 2.3.3.

This capabilities and opportunities assessment for Calistoga lists the various types of capabilities along with how they have been, currently are, or will in the future be integrated into hazard mitigation planning efforts. The three "HMP Integration" columns that identify the capability's status and usage are color-coded with green, yellow, or orange shading to communicate the following:

- **Status:** If the capability is present at all and what level of use it has generally.
- **Current Mitigation Use:** If the capability is currently being used in mitigation efforts, specifically, and at what level.
- **Future Opportunity:** If there is a future opportunity to integrate the capability into mitigation efforts and at what level.

Summary of Capabilities & Opportunities

This Capabilities and Opportunities Assessment for Calistoga summarizes the various types of capabilities it has for hazard mitigation currently. The assessment also identifies opportunities to integrate, expand, and

improve the city's capabilities for future hazard mitigation. Table 2-15 provides a comprehensive list of capabilities and identifies the current status, current mitigation use, and future opportunities.

Planning & Regulatory

The City of Calistoga has strong planning and regulatory capabilities that support hazard risk reduction and resilient development. The city enforces the California Building Code (Title 24) and locally adopted ordinances that address floodplain management, fire safety, stormwater control, water conservation, and development in inundation and hillside areas. These regulations are integrated into zoning, subdivision, and site plan review processes, ensuring that hazard considerations are addressed during development reviews.

Growth management is guided by policies in the city's General Plan. Capital investments are prioritized through the Capital Improvements Program (CIP), which supports resilient infrastructure for water, storm drainage, transportation, and public services.

Calistoga maintains several hazard reduction programs, including stormwater management and erosion control, water conservation, and public outreach through the Alert Napa County emergency preparedness webpage. The city also promotes non-structural earthquake preparedness and household-level mitigation actions.

The City participates in the National Flood Insurance Program (NFIP) and enforces local floodplain management regulations supported by current FEMA flood mapping and elevation certificate records. While flood preparedness information is available, flood insurance education is limited, and the City does not currently participate in FEMA's Community Rating System (CRS), representing a future opportunity for enhanced flood risk reduction.

Future integration of the MJHMP will occur through various processes and mechanisms outlined across multiple mitigation actions (Table 2-16). A key opportunity for future hazard mitigation integration with the city's existing planning mechanisms is to integrate the updated risk assessment and projected climate change impacts on hazards into the Climate Adaptation and Resilience Plan (ma-CC-CL-219).

Administrative & Technical

The City of Calistoga has strong administrative and technical capacity to support hazard mitigation planning, implementation, and coordination. Core planning, engineering, and development review functions are housed within the Planning & Building Department. These staff provide expertise in land use planning, development review, infrastructure design, and enforcement of building and safety standards.

The city has access to qualified personnel for key hazard mitigation functions, including community planning, land development review, construction engineering, natural hazards analysis, transportation planning, and resilience planning. The Building Division provides building code administration, and the City Manager serves as the Floodplain Administrator and Director of Emergency Services, ensuring direct

coordination between planning, emergency management, and floodplain compliance. Fire prevention and wildfire mitigation functions are supported by the Calistoga Fire Department through the Fire Marshal.

While the City does not have dedicated staff for public outreach, GIS, or grant management, these functions are addressed through shared responsibilities across departments and through coordination with regional partners such as Napa County, which provides GIS support. This shared staffing approach effectively supports current mitigation activities but represents an opportunity for enhancement as hazard mitigation, climate adaptation, and grant funding efforts expand.

Warning Systems & Services

The City of Calistoga has strong warning and emergency communication capabilities to alert residents, businesses, and visitors of hazardous conditions and emergency situations. The city utilizes the Alert Napa County emergency notification system as its primary platform for disseminating time-sensitive warnings related to natural hazards, evacuations, sheltering, and public safety incidents. These alerts are also supported by vehicle and stationary sirens located throughout the city and surrounding areas.

Emergency information is also communicated through city and partner social media channels, which provide rapid updates and situational awareness during evolving incidents. These electronic communication methods are supplemented by non-electronic outreach, including door-to-door notifications when necessary, and emergency vehicle sirens used by police and fire agencies to warn the public in affected areas.

This multi-channel approach helps ensure redundancy and increases the likelihood that critical information reaches residents with varying access to technology or communication needs. Warning systems support response to a range of hazards, including flooding, wildfire, earthquakes, extreme weather, and power shutoff events.

In addition, the city's 70-acre fairgrounds property serves as an incident command post for the city, CAL FIRE, and other emergency services during large incidents, such as the Pickett and Tubbs Fires in the past decade. The fairgrounds can also serve as a temporary evacuation location, including for adjacent communities and counties when needed. The city is evaluating opportunities to formalize the fairgrounds as its Emergency Operations Center with emergency sheltering facilities.

Fiscal

The City of Calistoga has moderate to strong fiscal capacity to support hazard mitigation through a combination of local revenues, fees, grants, and long-term financing tools. These funding mechanisms support infrastructure maintenance, capital improvements, and implementation of hazard mitigation measures identified in city plans and programs.

The City collects utility fees for water, recycled water, and sewer services, which help fund infrastructure upgrades that support drought resilience, flood protection, and system reliability. System development and impact fees are also a key funding source and are assessed for traffic, housing, water and wastewater

capacity, parks and recreation, civic facilities, General Plan implementation, and fire district mitigation. These fees help ensure that new development contributes to infrastructure needed to safely accommodate growth.

Calistoga has the authority to use general obligation bonds and special tax or revenue bonds to finance large capital projects, providing flexibility to fund hazard mitigation–related infrastructure improvements when voter approval or project-specific revenues are available. The city also adopts a Capital Improvement Program (CIP) tied to the annual budget, which prioritizes investments in infrastructure that supports public safety and resilience.

Additional funding sources include Community Development Block Grants (CDBG), which can be used for hazard-related housing rehabilitation and infrastructure improvements, particularly for vulnerable populations. While special-purpose taxes and benefit assessments are not consistently used, the City has the authority to pursue voter-approved tax measures for specific purposes, such as public safety or infrastructure, representing a future opportunity to expand mitigation funding.

Education & Outreach

The City of Calistoga has strong education and outreach capabilities that support public awareness, preparedness, and risk reduction for natural hazards. The city maintains a dedicated emergency preparedness webpage, Alert Napa County, which centralizes information on alerts, evacuations, flooding, wildfire, earthquakes, power shutoffs, and other hazards. This resource serves as the primary hub for hazard-related public information.

The city actively uses social media platforms, including City websites, Facebook, and YouTube, to disseminate emergency information, preparedness messaging, and real-time updates during incidents. These digital tools are complemented by participation in annual public safety and preparedness events, such as the Great California ShakeOut and Ready Napa County initiatives.

Calistoga supports community-based preparedness through the Community Emergency Response Team (CERT) program and partnerships with regional organizations, including local Fire Safe Councils and the Napa Communities Firewise Foundation. The city also collaborates with the Napa County Resource Conservation District, which provides outreach related to wildfire, drought, and other environmental hazards.

City staff are available to respond to public inquiries and provide technical assistance related to hazard preparedness, floodplain regulations, and development standards through phone, email, and web-based requests. While hazard information is primarily disseminated online, printed materials and library-based resources are used on a limited basis, representing an opportunity for expanded outreach to residents with limited digital access.

ASSESSMENT LEGEND

HMP Integration

Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Table 2-15: City of Calistoga Capabilities and Opportunities Assessment

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Planning and Regulatory Capabilities				
Construction and Future Development Regulations				
Building Codes				California Building Code (California Code of Regulations, Title 24) adopted and amended under Title 15
BCEGS Rating				
Public Protection (ISO Class)				3/3Y
Hazard-Related Development Standards				Titles 15, 16, 17, 18, and 19 cover development standards for fire, climate change, seismic, geologic, flood, and drought hazards; Title 15 covers fire code amendments and enhancement; FHSZ ordinance adopted
Zoning Ordinance				Title 17
Hazard-Specific Ordinance				Titles 18 and 19 cover regulations for flood, geologic, and other hazards
Growth Management Ordinance				General Plan (Land Use, Infrastructure, Housing, and other elements) and Chapter 19.02, Growth Management System
Hazard Reduction Programs (Annually Conducted)				
Capital Improvements Program (CIP) or Plan				Program forecasts, details, and tracks progress on facility and infrastructure improvements (e.g., parks, stormwater, streets, water, and wastewater)
Erosion/Sediment Control Program				Title 19 includes regulations for stormwater runoff and pollution control, watercourses, slopes, and erosion hazards

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Hazard-Related Public Outreach Program				City Manager, Office of Emergency Services
Urban Water Management Plan				Title 19 includes regulations for stormwater runoff and pollution control, watercourses, and water quality and quantity conservation
Stormwater Management Program (Annual Inspections)				Title 19 covers stormwater runoff and pollution control and Public Works Dept manages stormwater
Seismic Safety Program (Non-structural)				City Manager, Office of Emergency Services; Public Works
Earthquake Modernization Plan (Building Safety)				General Plan Public Safety Element prescribes actions to address remaining URM and other seismically unsafe buildings through targeted outreach and enforcement of the California Building Code
Hazard Plans				
General Plan Safety Element				2020 Public Safety Element covers geologic, seismic, flood, dam failure, tsunami/seiche, and wildfire hazards (needs update)
Site Plan Review Requirements				Title 17 review procedures for Use Permits and Design Review
General Plan Environmental Justice Element				No formal Element, but incorporated in various elements of the 2020 General Plan
Community Wildfire Protection Plan (CWPP)				2021 Napa County CWPP
Economic Development Plan				2020 General Plan Economic Development Element
Floodplain Management Plan				2020 Public Safety and Housing Elements, and Title 18, Floodplain Management regulations
Stormwater Management Plan				Title 19 covers stormwater runoff and pollution control and Public Works Dept manages stormwater
Emergency Operations Plan				2017 Napa County EOP, City Annex; updated to 2024 EOP, working on annex update
Climate Action Plan				2014 Climate Action Plan and 2020 General Plan Open Space and Conservation Element; update opportunity
Climate Vulnerability Assessment				No formal assessment, but incorporated in 2014 Climate Action Plan and 2020 General Plan Open Space and Conservation Element
Urban Greening Plan				2014 Climate Action Plan, 2020 General Plan Open Space and Conservation Element, and Chapter 19.01, Trees

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Ground Water Management Planning / Plans				Maintained by Napa County Groundwater Sustainability Agency; Chapter 19.08, Conservation Regulations
National Flood Protection Program (NFIP)				
Floodplain Management Regulations				Title 18, Floodplain Management regulations
Flood Insurance Education and Technical Assist.				Available through Public Works Dept, Engineering Services
Flood Insurance Study				FEMA FIS 06055CV000C effective 2016
Elevation Certificates				Elevation Certificates managed by Public Works Dept, Engineering Services
Flood Hazard Mapping / Re-Mapping				FEMA FIRMs effective 2008 and 2016
Community Rating System (CRS)				Does not currently participate
Administrative and Technical				
Community Planning and Development Services				
Community Planner				Planning & Building Dept, Planning Division
Planner/Engineer (Land Development)				Planning & Building Dept, Planning Division, and Public Works Dept, Engineering Services
Engineer/Professional (Construction)				Public Works Dept, Engineering Services
Planner/Engineer/Scientist (Natural Hazards)				Shared role within Public Works Dept, Engineering Services
Transportation Planner				Public Works Dept, Public Transit Services
Resiliency Planner				Shared role within Planning & Building Dept, Planning Division
Building Code Official (Full time or Augmented)				Planning & Building Dept, Building Division
Floodplain Administrator				Planning & Building Dept Director
Fire Marshal				Fire Dept
Dedicated Public Outreach Personnel				No dedicated staff; shared across departments; future opportunity
GIS Specialist and Capability				No dedicated staff; limited capabilities
Emergency Manager				City Manager, Office of Emergency Services
Dedicated Grant Manager, Writer, or Specialist				No dedicated staff; shared across departments; future opportunity
Other	N/A	N/A	N/A	
Warning Systems/Services				

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
General				Alert Napa County system; Hi-Lo emergency vehicle sirens; emergency alert sirens; Channel 27; AM 1670
Flood				Alert Napa County system; Hi-Lo emergency vehicle sirens; emergency alert sirens; Channel 27; AM 1670
Tornado				Alert Napa County system; Hi-Lo emergency vehicle sirens; emergency alert sirens; Channel 27; AM 1670
Wildfire				Alert Napa County system; Hi-Lo emergency vehicle sirens; emergency alert sirens; Channel 27; AM 1670
Geological Hazards				Alert Napa County system; Hi-Lo emergency vehicle sirens; emergency alert sirens; Channel 27; AM 1670
Fiscal Capabilities				
Financial Resources for Hazard Mitigation				
Levy Taxes for Specific Purposes				Not consistently applied, but can place special tax measures on ballot for specific purposes (e.g., sales tax for public safety)
Utilities Fees				Water and wastewater fees
Benefit assessments				Not currently in use; future opportunity
Community Development Block Grants				Recieved via HUD; can support hazard-related housing rehabilitation and infrastructure
System Development Fee				Development impact/system fees collected for City infrastructure
General Obligation Bonds to Incur Debt				General obligation bonds are available financing tools
Special Tax Bonds to Incur Debt				Special tax/revenue bonds are authorized for specific projects
Withheld Spending in Hazard-Prone Areas				General Plan policies restrict development in hazard-prone areas
Stormwater Service Fees				Not currently in use; future opportunity
Capital Improvement Project Funding				CIP is adopted; tied to annual budget and GP implementation
Education / Outreach Capabilities				
Education/Outreach Resources				

Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Website Dedicated to Hazard Topics				Maintains Disaster Preparedness webpage
Dedicated Social Media				Active Facebook and YouTube pages
Local Citizen Groups That Communicate Hazard Risks				Informal local groups provide hazard information; CERT; Calistoga Fire Safe Council
Hazard Info. Avail. at Library/ Planning Desk				Hazard info available via City website and partner websites
Annual Public Safety Events				Participates in Earthquake ShakeOut, Ready Napa County, and other regular events
Ability to Field Public Tech. Assistance Requests				Staff respond to inquiries via phone, email, and web forms; department-specific technical assistance available
Public Safety Newsletters or Printed Outreach				Not used consistently; mostly web-based
Community Emergency Response Team (CERT)				Calistoga CERT
Fire Safe Councils				Calistoga Fire Safe Council and others through Napa Communities Firesafe Foundation
Firewise				Firewise USA participant
StormReady				Not StormReady designated
Resource Conservation Districts				Napa County RCD provides outreach on wildfire, drought, and other hazard topics; City participates through partnerships
Other	N/A	N/A	N/A	

2.6.2 City of Calistoga Mitigation Action Plan

Calistoga's mitigation actions were developed through a collaborative process informed by the updated risk assessment, local priorities, and extensive stakeholder engagement. As part of this 2026 MJHMP update, the city reviewed mitigation actions from its prior Local Hazard Mitigation Plan to determine which actions to carry forward, which to consolidate, and where entirely new strategies were required. This careful evaluation ensured that the updated action plan builds upon past commitments while also responding to current risks and future challenges.

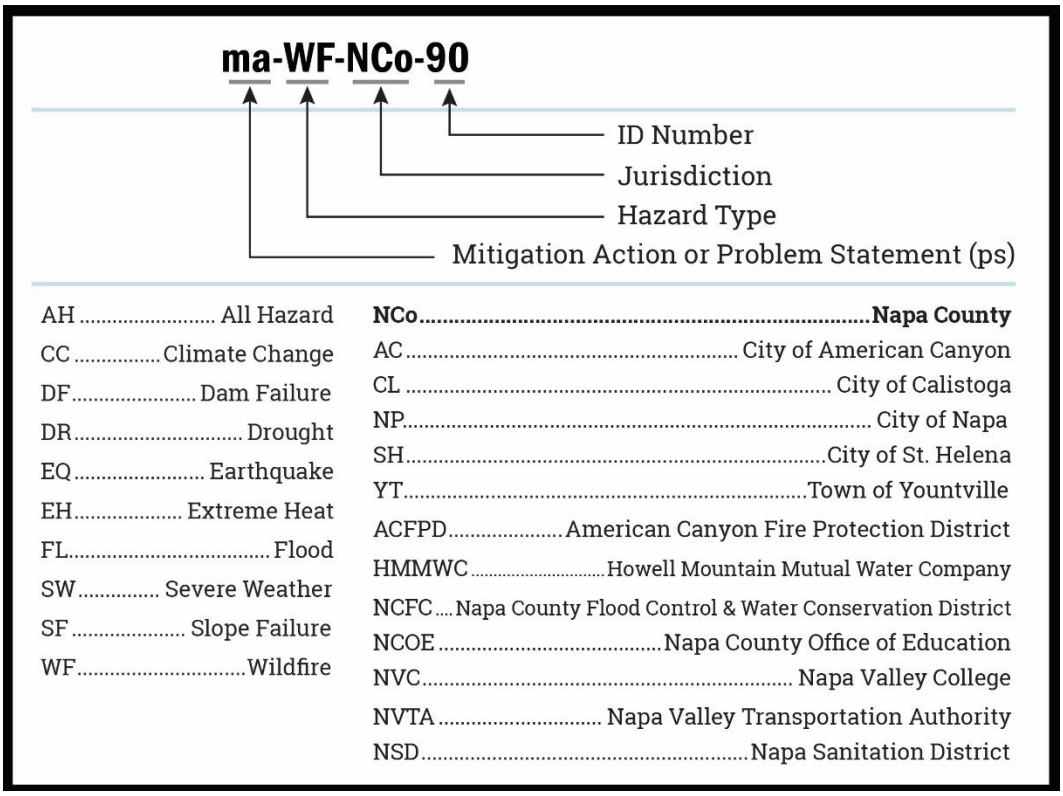


Figure 2-18: Mitigation Action Number Key

The plan addresses Calistoga's most significant hazards, including wildfire, earthquake, flood, slope failure, drought, dam failure, and extreme weather. Each mitigation action is designed to align with FEMA's hazard mitigation guidance and the requirements of the Disaster Mitigation Act of 2000. Where appropriate, overlapping or redundant actions were consolidated into broader, more comprehensive strategies that improve clarity, increase feasibility, and strengthen regional coordination.

The mitigation action prioritization method used by all participating jurisdictions is described in Volume 1, Section 4. Each action specific to Calistoga is documented in Table 2-16, which identifies the responsible department, implementation timeframe, potential funding sources, and resources required to complete the action. Each action is also assigned a unique alphanumeric identifier (see Figure 2-18) that links the strategy to its associated hazard and supports consistent monitoring and reporting.

Calistoga's approach recognizes that some hazards are most effectively addressed through regional efforts. Flood protection, drought resilience, and wildfire risk reduction often extend beyond the city's boundaries and require collaboration with county, regional, and state partners. By aligning local actions with regional strategies, Calistoga helps to consolidate resources, maximize funding opportunities, and ensure that mitigation projects achieve the greatest benefit for the Napa Valley, and the wider Napa County community.

Collectively, these mitigation actions provide a roadmap for reducing hazard risk, protecting vulnerable populations, and strengthening the long-term resilience of Calistoga.

Table 2-16: City of Calistoga Mitigation Action Plan

Mitigation No.	Hazard Type	Sub-Hazard	Mitigation Type	Year	Primary Agency	Title	Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Problem Statements
ma-AH-CL-3	All Hazard		ES - Emergency Services , SP - Structural Projects	2020	City of Calistoga	Microgrid & Backup Power Expansion Program	Expand Calistoga's existing microgrid and backup-power capacity for critical facilities (e.g., EOC, Police/Fire Station, WWTP) to ensure energy reliability during outages and PSPS events.	Public Works Department	High	High	3-5 Years	Project	HMGP / BRIC , General Fund	High	ps-WF-CL-184, ps-EH-CL-328, ps-WF-CL-317, ps-WF-CL-318
ma-AH-CL-87	All Hazard		SP - Structural Projects	2013	City of Calistoga	Retrofit & Replace Critical Infrastructure	Replace and upgrade aging and vulnerable water, sewer, recycle, and stormwater infrastructure to increase resilience against wildfire, earthquake, severe weather, flood, and drought. Improve water delivery system to provide sufficient fire flows and pressures, including additional system loops. Improve or replace brittle, undersized, and leaking lines at risk from hazard events.	Public Works Department	High	High	5-10 Years	Project	HMGP / BRIC , CDBG DRI , EMPG , General Fund , CalFIRE	Extreme	ps-WF-CL-179, ps-WF-CL-318, ps-SW-CL-147, ps-SW-CL-145, ps-SW-CL-125, ps-FL-CL-111, ps-EQ-CL-67, ps-DR-CL-321
ma-AH-CL-218	All Hazard		PPRO - Property Protection , ES - Emergency Services	2026	City of Calistoga	Expand Emergency Sheltering Network	Identify additional emergency shelter locations for a range of hazard events and ensure all primary locations are accessible and have sufficient back up power and HVAC systems (e.g., Tubbs, Butler, Civic Center/Fairgrounds).	Office of Emergency Services	Medium	High	3-5 Years	Project	HMGP / BRIC , General Fund	Medium	ps-CC-CL-13, ps-FL-CL-108, ps-EQ-CL-82, ps-EH-CL-326, ps-EH-CL-327, ps-EH-CL-328, ps-SW-CL-145, ps-SW-CL-323, ps-WF-CL-179, ps-WF-CL-183, ps-WF-CL-317
ma-AH-CL-247	All Hazard		ES - Emergency Services	2026	City of Calistoga	New Emergency Operations Center	Develop a new Emergency Operations Center (EOC) at the Calistoga Fairgrounds to serve as City and CalFire Incident Command Post and as an evacuation location.	Office of Emergency Services	High	Medium	3-5 Years	Project	HMGP / BRIC , EMPG , General Fund	High	
ma-CC-CL-219	Climate Change		PRV - Prevention	2026	City of Calistoga	Climate Adaptation & Resilience Plan Update	Update the 2014 Climate Action Plan to include a vulnerability assessment as well as mitigation and adaptation strategies for climate-driven hazards.	Planning & Building Department	Medium	Low	3-5 Years	Project	HMGP / BRIC , General Fund	Medium	ps-DR-CL-321, ps-FL-CL-319, ps-CC-CL-325, ps-CC-CL-324, ps-CC-CL-15, ps-CC-CL-13, ps-EH-CL-326
ma-DR-CL-22	Drought		SP - Structural Projects	2020	City of Calistoga	Water Supply Contingency & Storage Expansion	Implement water supply contingency projects, such as increasing water supply delivery, storage, and treatment capacity at Kimball Reservoir and Water Treatment Plant, to improve resilience during drought years.	Public Works Department	High	High	5-10 Years	Project	HMGP / BRIC , General Fund	Medium	ps-DR-CL-47, ps-DR-CL-321, ps-DR-CL-320, ps-DR-CL-46, ps-DR-CL-45
ma-DR-CL-220	Drought		PE&A - Public Education & Awareness	2026	City of Calistoga	Water Conservation Outreach Program	Expand outreach on water conservation practices, drought-resilient landscaping, and plumbing fixture upgrade resources for residents and businesses.	City Manager's Office	Low	Medium	1-3 Years	Capacity / Capability Building	HMGP / BRIC , General Fund	High	ps-DR-CL-321, ps-DR-CL-320, ps-DR-CL-45
ma-EQ-CL-34	Earthquake		PPRO - Property Protection	2020	City of Calistoga	Critical Facilities Seismic Retrofits	Assess and retrofit critical facilities, such as the Tubbs and Butler buildings and the fire station, to meet current seismic standards.	Planning & Building Department, Public Works Department	High	High	5-10 Years	Project	HMGP / BRIC , General Fund	High	ps-EQ-CL-66, ps-EQ-CL-67, ps-EQ-CL-81, ps-EQ-CL-322
ma-EQ-CL-35	Earthquake		PE&A - Public Education & Awareness	2020	City of Calistoga	Earthquake Preparedness Outreach Program	Develop a comprehensive public education program on earthquake risk, household readiness, and retrofit resources.	Planning & Building Department, Office of Emergency Services	Low	Medium	1-3 Years	Capacity / Capability Building	HMGP / BRIC , General Fund	High	ps-EQ-CL-66, ps-EQ-CL-82, ps-EQ-CL-322

Mitigation No.	Hazard Type	Sub-Hazard	Mitigation Type	Year	Primary Agency	Title	Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Problem Statements
ma-FL-CL-48	Flood		NRP - Natural Resource Protection , SP - Structural Projects	2013	City of Calistoga	Stormwater Drainage & Flood Mitigation Improvements	Implement localized flood reduction projects and improve stormwater system capacity. Implement drainage improvements at public facilities and in frequently impacted areas to reduce localized flooding and improve water quality, including through installing back-up power for critical system components, increasing maintenance capacity (e.g., more street sweepers), and nature-based solutions such as rain gardens, permeable pavement, and bioswale retrofits.	Public Works Department	High	High	3-5 Years	Project	HMGP / BRIC , FMA , General Fund	High	ps-FL-CL-108, ps-FL-CL-109, ps-FL-CL-111
ma-SW-CL-79	Severe Weather		PRV - Prevention , NRP - Natural Resource Protection , SP - Structural Projects	2020	City of Calistoga	Utility & Tree Hardening Program	Establish standards and maintenance cycles for tree trimming and line clearance in collaboration with PG&E.	Public Works Department	Medium	High	3-5 Years	Capacity / Capability Building	HMGP / BRIC , General Fund	Medium	ps-SW-CL-147, ps-SW-CL-148, ps-SW-CL-323
ma-WF-CL-11	Wildfire		NRP - Natural Resource Protection , SP - Structural Projects	2020	City of Calistoga	Defensible Space & Fuel Break Enhancement	In coordination with the CWPP and Fire Safe Council, implement fuel-reduction and defensible-space projects in WUI areas and near critical facilities, and establish an ongoing maintenance program.	Fire Department	Medium	High	1-3 Years	Capacity / Capability Building	HMGP / BRIC , General Fund , CalFIRE	High	ps-CC-CL-13, ps-CC-CL-15
ma-WF-CL-89	Wildfire		PE&A - Public Education & Awareness	2013	City of Calistoga	Wildfire Preparedness & Prevention Outreach Program	Establish an outreach program focused on wildfire preparedness and prevention, including addressing human causes of ignition, evacuation preparedness, home mitigation methods (structure hardening, defensible space), and available mitigation resources and incentives.	Fire Department, Office of Emergency Services	Low	Medium	1-3 Years	Capacity / Capability Building	HMGP / BRIC , General Fund , CalFIRE	High	ps-WF-CL-179
ma-WF-CL-221	Wildfire		PRV - Prevention	2026	City of Calistoga	WUI Code Enforcement Program	Develop and implement a WUI code enforcement program that increases inspection capacity, improves enforcement mechanisms, and helps to educate property owners of risks, mitigation measures, and available resources, with a focus on those neighborhoods and properties most at risk and with vulnerable populations (e.g., seniors in FHSZs).	Fire Department	Medium	High	1-3 Years	Capacity / Capability Building	HMGP / BRIC , General Fund , CalFIRE	High	ps-WF-CL-184, ps-WF-CL-183, ps-WF-CL-179

2.6.3 Status of Previous Mitigation Actions

In 2020, the City of Calistoga adopted its previous FEMA-approved HMP. This 2026 MJHMP represents a comprehensive update from that previous plan, as discussed in Volume 1, Section 1.5. Table 2-17 provides status updates for all of the previous mitigation actions in the City of Calistoga HMP, from which many of the mitigation actions in Table 2-16 were sourced and revised.

Table 2-17: City of Calistoga Status of Previous Mitigation Actions

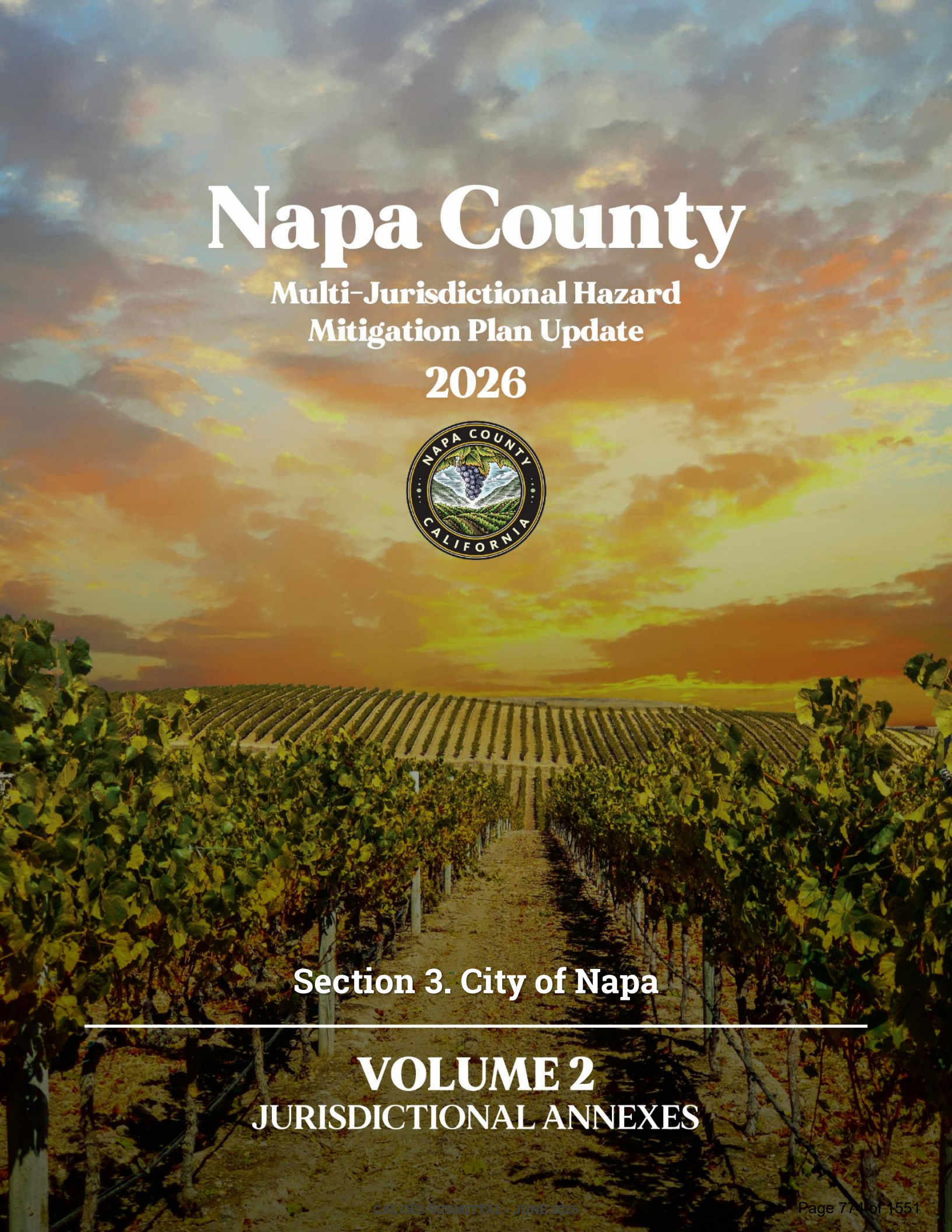
Mitigation No.	Hazard Type	Status	Year	Primary Agency	Title/Description	Reason Completed/ Cancelled
ma-AH-CL-3	All Hazard	Ongoing	2020	City of Calistoga	Microgrid & Backup Power Expansion Program	Revised
ma-WF-CL-87	Wildfire	Ongoing	2013	City of Calistoga	Retrofit & Replace Critical Infrastructure	Revised
ma-DR-CL-22	Drought	Ongoing	2020	City of Calistoga	Water Supply Contingency & Storage Expansion	Revised
ma-EQ-CL-34	Earthquake	Ongoing	2020	City of Calistoga	Critical Facilities Seismic Retrofits	Revised
ma-EQ-CL-35	Earthquake	Ongoing	2020	City of Calistoga	Earthquake Preparedness Outreach Program	Revised
ma-FL-CL-48	Flood	Ongoing	2013	City of Calistoga	Stormwater Drainage & Flood Mitigation Improvements	Revised
ma-SW-CL-79	Severe Weather	Ongoing	2020	City of Calistoga	Utility & Tree Hardening Program	Revised
ma-CC-CL-11	Climate Change	Ongoing	2020	City of Calistoga	Defensible Space & Fuel Break Enhancement	Revised
ma-WF-CL-89	Wildfire	Ongoing	2013	City of Calistoga	Wildfire Preparedness & Prevention Outreach Program	Revised
ma-DR-CL-21	Drought	Completed	2020	City of Calistoga	During Drought conditions increase fuel reduction in parks and open space areas.	Adopted City policy
ma-FL-CL-50	Flood	Completed	2020	City of Calistoga	Remap the floodplain and enhance flood protection for critical facilities north of Lincoln Avenue.	New FEMA flood study completed 2025
ma-WF-CL-88	Wildfire	Completed	2013	City of Calistoga	Revise the General Plan Safety Element with lessons learned from to include new information from HMP and Fire-wise programs and analysis.	General Plan Safety Element update completed in 2020
ma-CC-CL-12	Climate Change	Cancelled	2020	City of Calistoga	Map high-risk areas and implement fuel reduction projects.	Duplicate of CL-08-2020 (now revised)
ma-FL-CL-49	Flood	Cancelled	2013	City of Calistoga	Regularly inspect and maintain stormwater inlets and outfalls for debris, blockages, and damage.	Ongoing baseline mitigation requirement

Mitigation No.	Hazard Type	Status	Year	Primary Agency	Title/Description	Reason Completed/ Cancelled
ma-SW-CL-80	Severe Weather	Cancelled	2020	City of Calistoga	Identify schools designated by the Red Cross as emergency shelters and ensure they have backup power. Verify that all City and school shelters meet current codes, are in non-flood areas, and are equipped with standby power for public use during emergencies.	Revised to for all hazard (ma-AH-CL-218)

Napa County

Multi-Jurisdictional Hazard Mitigation Plan Update

2026



Section 3. City of Napa

VOLUME 2
JURISDICTIONAL ANNEXES

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Napa County

2026 Multi-Jurisdictional Hazard Mitigation Plan Update

City of Napa (CN)

Municipal Annex

Adoption Record **3-7**

Section 3. City of Napa **3-9**

3.1 Scope & Purpose 3-9

3.2 Jurisdictional Setting 3-9

3.2.1 Geography & Climate 3-10

3.2.2 Demographics & Vulnerable Populations 3-12

3.2.3 Economy 3-28

3.2.4 Growth Trends & Future Development 3-28

3.3 Planning Process 3-29

3.3.1 Public Input & Draft Review 3-34

3.4 What's New 3-34

3.4.1 Mitigation Activities 3-34

3.4.2 Successes Since 2021 3-35

3.5 Risk Assessment 3-38

3.5.1 Hazard Screening & Prioritization 3-38

3.5.2 Vulnerability to Specific Hazards 3-42

3.5.3 Climate Change Impacts & Vulnerable Populations 3-78

3.5.4 Hazard Problem Statements 3-79

3.6 Mitigation Strategy 3-83

3.6.1 Capabilities & Opportunities 3-84

3.6.2 City of Napa Mitigation Action Plan 3-97

3.6.3 Status of Previous Mitigation Actions 3-1

List of Figures

Figure 3-1: City of Napa Geographic Overview Map 3-11
Figure 3-2: City of Napa Median Household Income Map 3-15
Figure 3-3: City of Napa Poverty Status Map 3-16
Figure 3-4: City of Napa Housing Occupancy Map 3-17
Figure 3-5: City of Napa Dependent Age Groups Map 3-21
Figure 3-6: City of Napa Disabled Elderly Map 3-22
Figure 3-7: City of Napa Race and Ethnicity Map 3-24
Figure 3-8: City of Napa Spanish-Speaking Households Map 3-25
Figure 3-9: City of Napa CDC Social Vulnerability Index Map 3-27
Figure 3-10: City of Napa Risk Assessment Matrix 3-40
Figure 3-11: Exposure Summary- City of Napa Wildfire Risk 3-44
Figure 3-12: Exposure Summary – City of Napa Dam Inundation Zone 3-46
Figure 3-13: City of Napa Flood Risk (FEMA and DWR Awareness Zones) 3-48
Figure 3-14: Exposure Summary – City of Napa Flood Risk (FEMA Zones) 3-49
Figure 3-15: City of Napa Repetitive Loss Areas 3-53
Figure 3-16: Stonecrest RL Area 3-56
Figure 3-17: RiverPointe RL Area 3-57
Figure 3-18: Soscol North RL Area 3-58
Figure 3-19: Oxbow West RL Area 3-59
Figure 3-20: Oxbow East RL Area 3-60
Figure 3-21: Soscol South RL Area 3-61
Figure 3-22: Exposure Summary – City of Napa Earthquake Risk (M7.1 Hunting Creek–Berryessa) 3-67
Figure 3-23: Exposure Summary – City of Napa Earthquake Risk (M6.7 West Napa) 3-68
Figure 3-24: Exposure Summary – City of Napa Liquefaction Risk 3-69
Figure 3-25: Drought Severity Timeline 2000-2026 3-72
Figure 3-26: Mitigation Action Number Key 3-97

List of Tables

Table 3-1: City of Napa Population and Households 3-12
Table 3-2: City of Napa Income and Poverty 3-13
Table 3-3: City of Napa Renter- and Owner-Occupied Housing 3-14
Table 3-4: City of Napa Households with Seniors 3-18
Table 3-5: City of Napa Households with Children 3-19
Table 3-6: City of Napa Population with Disabilities and Access to Transportation 3-20
Table 3-7: City of Napa Household Languages 3-23
Table 3-8: City of Napa Planning Team and Steering Group Members 3-30
Table 3-9: City of Napa Planning Team Meetings 3-33
Table 3-10: City of Napa Document Review of Potential Hazards 3-39
Table 3-11: City of Napa Hazards Prioritization Summary 3-41

Table 3-12: City of Napa National Flood Insurance Program Information 3-50
Table 3-13: Summary of Relevant Discharges in Napa County 3-63
Table 3-14: Drought Classifications and Impacts 3-70
Table 3-15: Cal-Adapt Extreme Heat Thresholds 3-74
Table 3-16: City of Napa Hazard Problem Statements 3-80
Table 3-17: City of Napa Capabilities and Opportunities Assessment 3-92
Table 3-18: City of Napa Mitigation Action Plan 3-98
Table 3-19: City of Napa Status of Previous Mitigation Actions 3-1

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Adoption Record

To comply with the Federal Disaster Mitigation Act of 2000 (DMA 2000), the City of Napa City Council has officially adopted this 2026 Napa County Multi-Jurisdictional Hazard Mitigation Plan, including Volume 1 in its entirety as well as this Volume 2 municipal annex. The adoption of the MJHMP recognizes the city's commitment to reducing the impacts of natural hazards within their jurisdiction and across Napa County.

A copy of the City of Napa's adoption record is provided on the following pages.

INSERT City of Napa adoption record

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Section 3. City of Napa

3.1 Scope & Purpose

This Jurisdictional Annex for the City of Napa of the 2026 Napa County Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) details the hazard mitigation planning elements specific to the city's planning area. The annex is not intended to be a standalone document but appends to and supplements the information contained in the umbrella plan document (Volume 1). As such, all sections of the umbrella plan, including the planning process and other procedural requirements, apply to and were met by the City of Napa. This annex provides additional information specific to the city, with a focus on hazard identification and risk assessment, vulnerability assessment, problem statements, mitigation strategy, and capabilities assessment. Below are the City of Napa Points of Contact:

Primary Point of Contact	Alternate Point of Contact
Zach Curren, Fire Chief City of Napa 1600 Clay Street Napa, CA 94559 Telephone: (707) 257-9593 Email: zcurren@cityofnapa.org	Jaina French, Community Relations & Media Manager City Manager's Office, City of Napa PO Box 660 / 955 School Street, Napa, CA 94559 Telephone (707) 258-7843 Email jfrench@cityofnapa.org

3.2 Jurisdictional Setting

The City of Napa is located in the heart of Napa County in Northern California, at the southern end of the world-renowned Napa Valley wine region approximately 50 miles north of San Francisco and accessible via State Route 29 and State Route 121. Napa is a vibrant city with a blend of historical charm and contemporary development, serving as the county seat and a central hub for government, tourism, and commerce.

Nestled along the Napa River and surrounded by vineyards and rolling hills, the City of Napa reflects its agricultural heritage while also embracing innovation in food, wine, and sustainable development. The community is known for its commitment to environmental resilience, historic preservation, and cultural vitality. Landmarks such as the Napa Riverfront, the Uptown Theatre, and historic downtown buildings illustrate the city's rich past and dynamic present.

The City of Napa spans approximately 18.1 square miles, with an average elevation of 20 feet above sea level. Napa continues to grow steadily, with ongoing efforts in urban planning, housing development, transportation improvements, and flood mitigation projects that reflect the city's forward-thinking approach to resilience and livability. City of Napa's location within Napa County and the State of California are shown in Figure 3-1.

- **Date of Incorporation:** March 23, 1872
- **Current Population:** 78,174 (United States Census Bureau, 2016-2021)
- **Population Growth:** The City has experienced an estimated a population increase of 9% between 2010 and 2021 (United States Census Bureau, 2016-2021)

3.2.1 Geography & Climate

The City of Napa, located in the southern portion of the Napa Valley in Northern California, is characterized by a diverse geography that includes flat valley floors, rolling hills, and riverine features. The city lies along the Napa River, which plays a central role in its hydrology and has influenced both development patterns and floodplain management. Napa's terrain is largely shaped by alluvial deposits from nearby hills and mountains, consisting of fertile soils that have historically supported the region's agricultural economy, particularly viticulture.

To the east and west of the city, the landscape transitions into low mountain ranges and foothills, which form part of the Coast Ranges and contribute to microclimates within the valley. These geologic formations include sedimentary rocks, volcanic deposits, and clay-rich soils, all of which influence local drainage, vegetation, and land use suitability.

Napa's climate is Mediterranean, with warm to hot, dry summers and mild, wet winters. Average high temperatures in the summer can reach the 80s to low 90s degrees Fahrenheit (°F), while winter lows typically range from the upper 30s to mid-50s°F. Most precipitation falls between November and March, with minimal rainfall during the summer months. Snowfall is virtually nonexistent due to the city's low elevation of approximately 20 feet above sea level.

Local wind patterns are generally light but can be influenced by marine air flow from San Pablo Bay to the south, especially during summer evenings, contributing to the region's favorable growing conditions. While Napa's geography and climate support a thriving wine and tourism industry, they also pose hazard risks such as flooding, drought, and wildfire in surrounding areas.

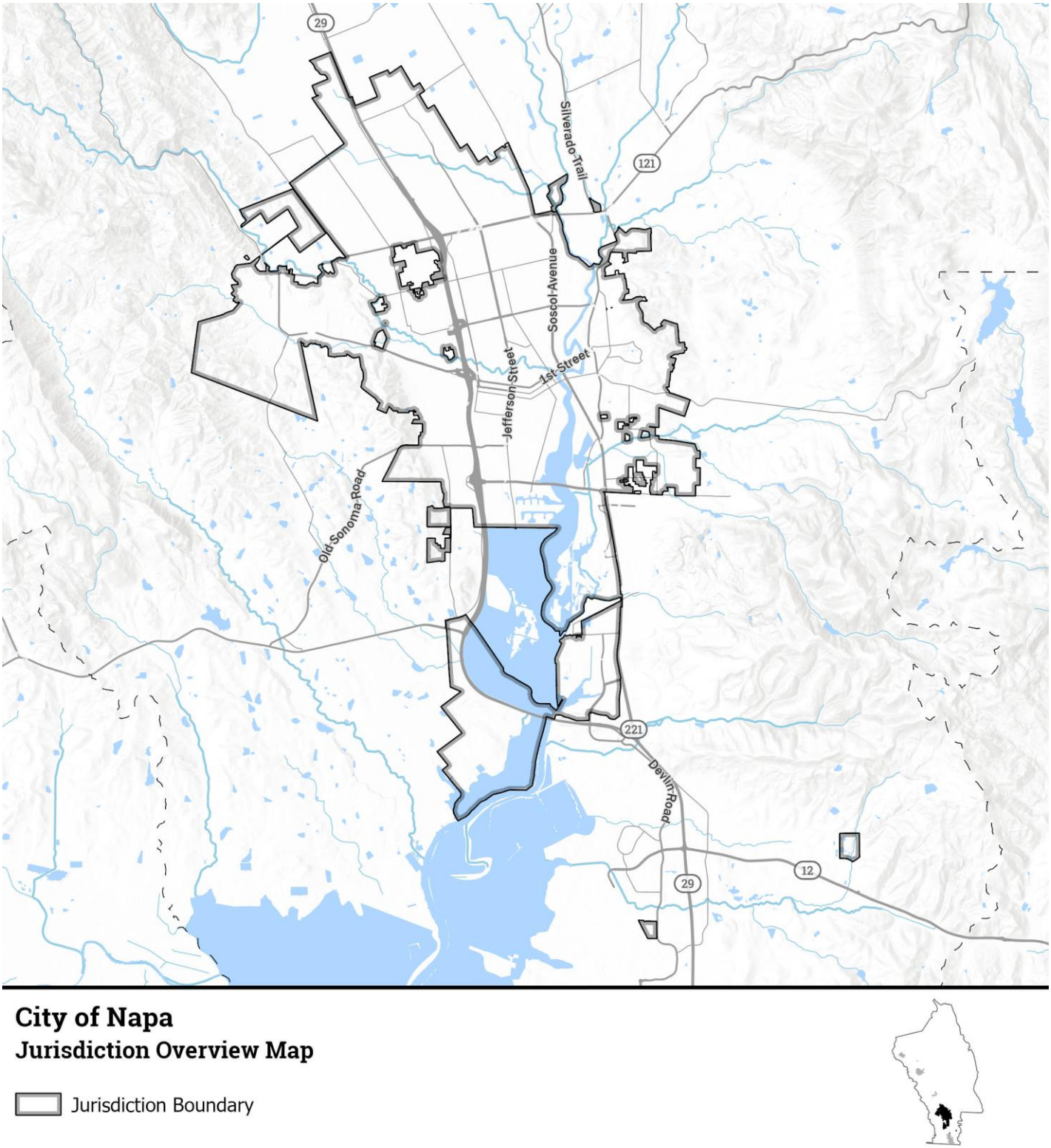


Figure 3-1: City of Napa Geographic Overview Map

3.2.2 Demographics & Vulnerable Populations

This section describes the demographic characteristics of the City of Napa to guide hazard mitigation planning efforts. Natural disasters affect communities both physically and socially, with demographic composition playing a central role in determining how impacts are distributed, particularly among vulnerable groups facing greater challenges in preparedness, response, and recovery. Understanding the area's social and economic landscape also helps assess potential social costs from infrastructure damage, including housing, industry, public facilities, essential services, and transportation.

Exploring local demographic data may help to identify groups and geographic areas with specific vulnerability to hazard events. In the context of all-hazards preparedness and response planning, at-risk individuals (often used interchangeably with "vulnerable populations") are defined federally as "children, pregnant women, senior citizens, and other individuals who have access or functional needs in the event of a public health emergency." (42 U.S.C. § 2802(b)(4)(B) (2019)) These populations may include, but are not limited to, individuals who are economically disadvantaged, living with disabilities, dependent on caregivers, from historically marginalized communities, have limited English proficiency or are non-English speaking, lack access to transportation, are experiencing homelessness, or have chronic medical conditions.

Certain populations face greater risk following a natural hazard event due to age, economic mobility, physical disability, geographic location, or a combination of factors. Vulnerability in the face of a hazard event is not a fixed characteristic; the same individual may be at risk for some hazards but not at risk for others. Planning for vulnerable populations in the context of hazard mitigation can help communities to prioritize limited resources where they will be the most effective. Refer to Volume 1, Section 1.4.3, for a more in-depth discussion of planning for vulnerable populations, at-risk individuals with access and functional needs, and environmental justice.

The total population, total number of households, and average household size of the City of Napa are presented in Table 3-1, compared to the other municipalities and Napa County. As shown in the table, Napa is the largest city in Napa County.

Table 3-1: City of Napa Population and Households

Area	Total Population	Total Households (HH)	Average HH Size
Napa County	137,384	55,588	2.40
City of Napa	**79,233**	**31,666**	**2.47**
City of American Canyon	21,669	5,924	3.64
City of Calistoga	5,191	2,330	2.20
City of St. Helena	5,426	2,963	1.81
Town of Yountville	3,397	1,824	1.45

Source: ACS 5-Year, 2017-2022

3.2.2.1 Income & Housing

Economic mobility is one of the most important predictors of natural hazard vulnerability. Low-income residents are more likely to occupy housing which is inadequately maintained or otherwise poorly built to withstand extreme events. For example, mobile or modular homes are more susceptible to damage in earthquakes and floods than other types of residences and are less likely to contain air conditioning units to cope with high heat events. In urban areas, low-income residents are more likely to occupy older homes and apartment complexes with unreinforced masonry, which is particularly susceptible to seismic damage.

Low-income households and communities face disproportionate financial burden from costs associated with disaster preparedness, response, and recovery. Disasters create unexpected expenses which may serve as "tipping points" for families and individuals living on the edge of poverty or homelessness. Recovery costs may be higher for those without resources to conduct hazard mitigation activities ahead of time. Families and individuals who lack access to transportation may be unable to evacuate ahead of an emergency. (Krause & Reeves, 2017)

Low-income residents and renters are also less likely to purchase insurance, meaning that those with the most to lose during an event are also the least prepared to deal with potential losses. Major hurricane events in recent history such as Harvey, Irma, and Katrina all demonstrate that low-income or historically marginalized communities face increased vulnerability to hazard events and struggle the most to recover.

Median household income in the City of Napa is just over $100,000 annually with an overall poverty rate of around 8%. By comparison, median income and poverty rates for Napa County were nearly $106,000 and 8%, respectively; refer to Table 3-2. Median income and poverty rates are also shown on the block group level in Figure 3-2 and Figure 3-3.

Table 3-2: City of Napa Income and Poverty

Area	Median Income	Poverty Rate
Napa County	$105,809	7.9%
City of Napa	**$100,273**	**8.1%**
City of American Canyon	$122,694	7.4%
City of Calistoga	$96,667	5.4%
City of St. Helena	$135,781	5.7%
Town of Yountville	$75,134	10.6%

Source: ACS 5-Year, 2017-2022

Renters are also more vulnerable to natural hazards, as they are less likely to take out property insurance and the decision to make major structural improvements typically lies with the property owner. Federal disaster recovery services can exacerbate inequality between renters and homeowners; payout amounts are significantly higher for homeowners applying through FEMA's Individual Assistance (IA) program; from 1999 to 2013 U.S. homeowners saw their wealth increase with local hazard damages, whereas renters' wealth decreased. (Howell, Junia; Elliot, James, 2019)

Approximately 40% of occupied housing units in the City of Napa are renters, compared to approximately 35% for Napa County as a whole; refer to Table 3-3. Housing occupancy are also shown on the block group level in Figure 3-4.

Table 3-3: City of Napa Renter- and Owner-Occupied Housing

Jurisdiction	# Occupied Housing Units	# Renter Occupied	% Renter Occupied	# Owner Occupied	% Owner Occupied
Napa County	49,738	17,676	35.5%	32,062	64.5%
City of Napa	**26,978**	**10,616**	**39.4%**	**16,362**	**60.6%**
City of American Canyon	6,192	1,371	22.1%	4,821	77.9%
City of Calistoga	2,042	822	40.3%	1,220	59.7%
City of St. Helena	2,380	1,048	44%	1,332	56.0%
Town of Yountville	1,050	362	34.5%	688	65.5%

Source: ACS 5-Year, 2017-2022

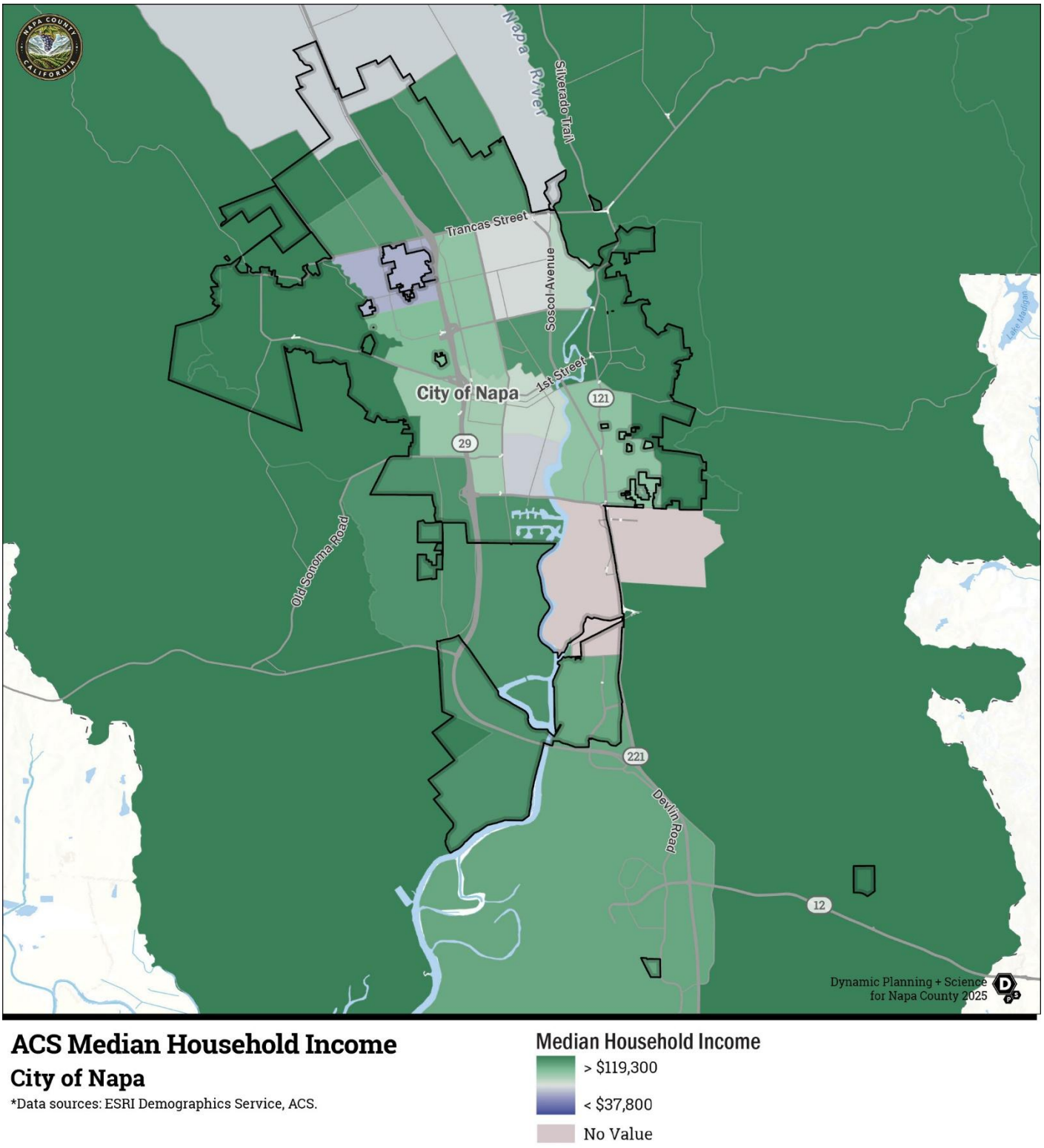


Figure 3-2: City of Napa Median Household Income Map

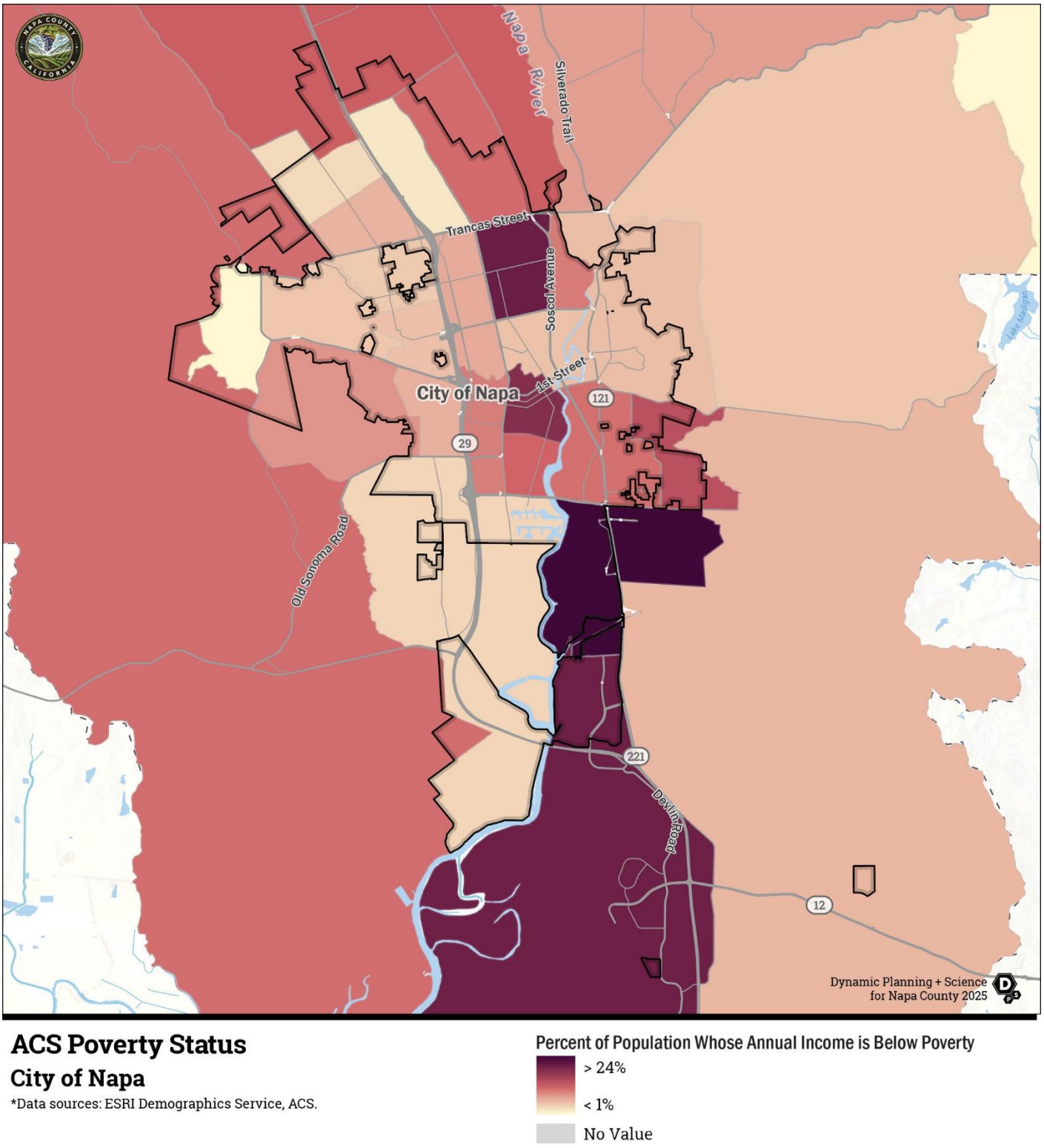
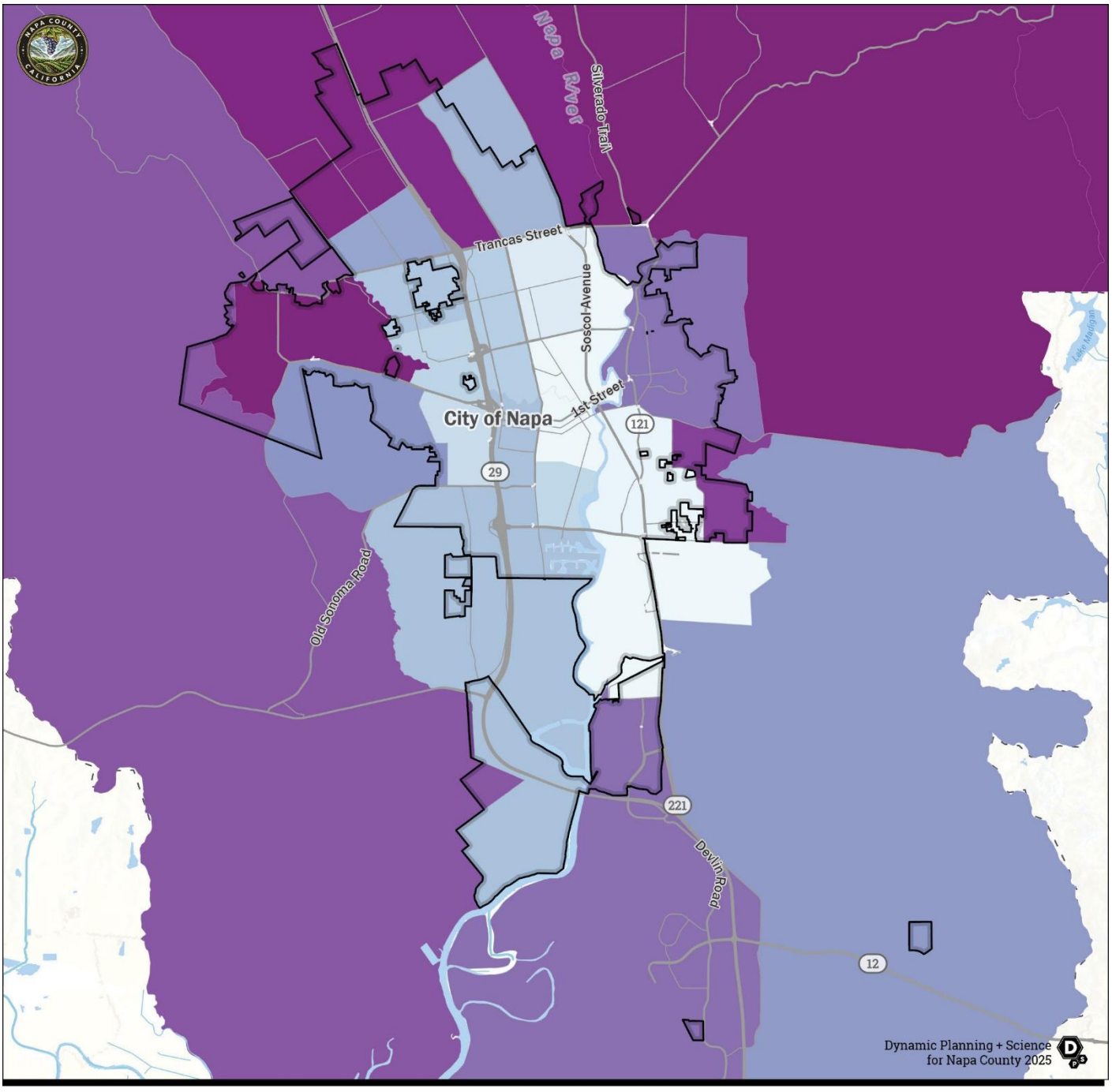


Figure 3-3: City of Napa Poverty Status Map



ACS Housing Occupancy

City of Napa

*Data sources: ESRI Demographics Service, ACS.

Percent of Housing Units that are Owner-Occupied

> 88%

< 41%

No Value

Figure 3-4: City of Napa Housing Occupancy Map

3.2.2.2 Dependent & Disabled Populations

Age is a significant factor in assessing vulnerability to natural hazards. Both older adults and children are considered dependent populations due to their reliance on caregivers for safety, mobility, and support during emergency events. These populations face heightened risks during disasters such as floods, wildfires, and earthquakes, particularly when compounding factors such as poverty, disability, or social isolation are present.

In the City of Napa, approximately 32.5% of households include at least one individual over the age of 65, and over 8% of all households consist of seniors living alone. While only around 2% of senior households live below the poverty line (Table 3-4), seniors, particularly those who are low-income or socially isolated, remain among the most vulnerable populations in disaster situations. Challenges for older adults may include limited mobility, chronic health conditions, reduced digital literacy, and lack of access to real-time emergency alerts. Seniors living alone may require additional assistance during evacuations or power outages, and assisted living facilities necessitate advanced coordination to ensure continuity of care and safety during emergencies.

Children represent another dependent population requiring special consideration (Table 3-5). In Napa, over 28% of households include individuals under the age of 18, with over 7% of these households headed by a single caregiver. During emergencies, children are entirely dependent on caregivers for decision-making, transportation, and access to essential resources. Disruptions to schools, childcare, and youth services can result in significant emotional, educational, and developmental impacts. Families with limited means or single caregivers may also face greater challenges in securing housing, supplies, and recovery assistance.

Figure 3-5 highlights areas within Napa with higher concentrations of economically dependent age groups, informing targeted outreach and response strategies during emergencies.

Table 3-4: City of Napa Households with Seniors

Jurisdiction	Households (HH)	65+	%	65+ Alone	%	65+ Poverty	%
Napa County	55,588	18,777	33.8%	4,816	8.7%	1,271	2.3%
City of American Canyon	5,924	1,772	29.9%	184	3.1%	111	1.9%
City of Calistoga	2,330	1,003	43.0%	419	18.0%	101	4.3%
City of Napa	**31,666**	**10,299**	**32.5%**	**2,674**	**8.4%**	**703**	**2.2%**
City of St. Helena	2,963	1,153	38.9%	296	10.0%	42	1.4%
Town of Yountville	1,824	873	47.9%	351	19.2%	77	4.2%

Source: ACS 5-Year, 2017-2022

Table 3-5: City of Napa Households with Children

Jurisdiction	Households	<18	%	<18 Single Caregiver	%
Napa County	55,588	14,596	26.3%	3,109	5.6%
City of American Canyon	5,924	2,633	44.4%	417	7.0%
City of Calistoga	2,330	471	20.2%	33	1.4%
City of Napa	**31,666**	**8,934**	**28.2%**	**2,315**	**7.3%**
City of St. Helena	2,963	619	20.9%	168	5.7%
Town of Yountville	1,824	160	8.8%	0	0.0%

Source: ACS 5-Year, 2017-2022

Elderly populations face increased risks during disaster events due to age-related health conditions, mobility limitations, and potential social isolation. In Napa, approximately 12% of the non-institutionalized population lives with a disability, this is on par with the countywide average (Table 3-6).

Among those with access and functional needs, elderly individuals with disabilities represent a highly vulnerable subpopulation when it comes to disaster preparedness, response, and recovery. This group includes seniors living with physical or cognitive impairments such as hearing or vision loss, reduced mobility, reliance on assistive medical devices, neurodivergence, or chronic health conditions that may be exacerbated by hazard events (e.g., exposure to wildfire smoke or extreme heat).

Figure 3-6 illustrates that in some portions of the city, more than 47% of the elderly population is estimated to have one or more disabilities, while other areas show lower proportions or lack available data. The spatial distribution shown on this map suggests that vulnerability is not uniform across the city and that certain neighborhoods may have greater needs for evacuation assistance, medical support, and continuity of care during emergencies. Seniors with disabilities may also be more sensitive to extended power outages, disruptions to medical services, and transportation interruptions. These risks are expected to increase under climate change conditions that intensify extreme heat events and strain emergency response resources.

The combination of advanced age and disability can present significant challenges not only during emergency response but also in implementing hazard mitigation measures. Elderly individuals with disabilities may face physical, financial, or logistical barriers to undertaking activities such as seismic retrofitting, anchoring fuel tanks, installing foundation bracing, or implementing residential flood-proofing techniques. Many live in older housing stock that is more vulnerable to earthquake damage or repetitive flooding and may lack the resources or support networks needed to complete mitigation upgrades.

Table 3-6: City of Napa Population with Disabilities and Access to Transportation

Jurisdiction	Population	Persons w/ Disability	%	Persons Reliant on Public Trans.	%	Households	HH w/o Vehicle	%
Napa County	137,384	16,544	12.0%	890	0.6%	55,588	2,421	4.4%
City of American Canyon	21,669	2,201	10.2%	287	1.3%	5,924	138	2.3%
City of Calistoga	5,191	573	11.0%	36	0.7%	2,330	83	3.6%
City of Napa	**79,233**	**9,837**	**12.4%**	**291**	**0.4%**	**31,666**	**1,554**	**4.9%**
City of St. Helena	5,426	683	12.6%	121	2.2%	2,963	219	7.4%
Town of Yountville	3,397	683	20.1%	15	0.4%	1,824	210	11.5%

Source: ACS 5-Year, 2017-2022

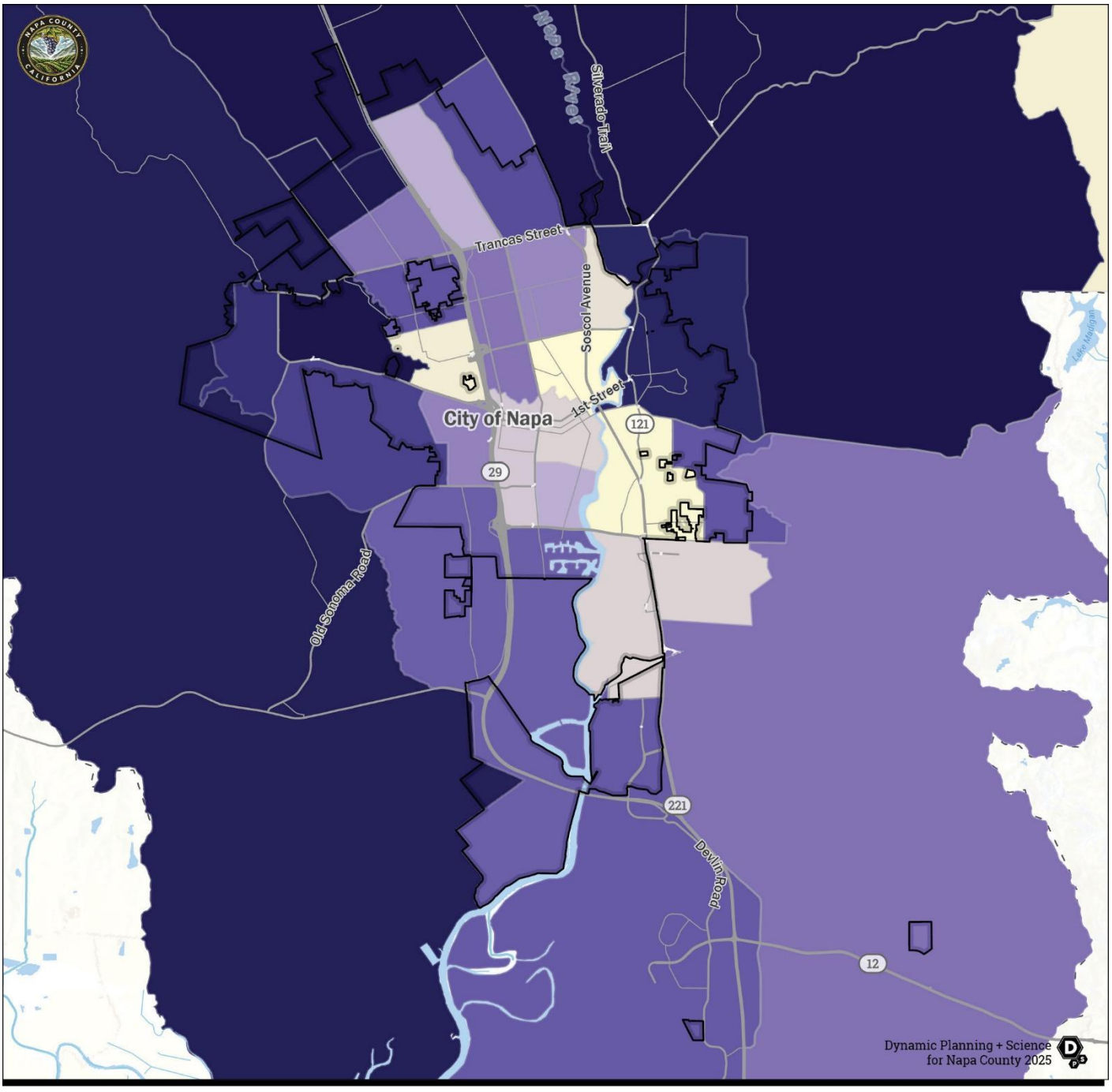


Figure 3-5: City of Napa Dependent Age Groups Map

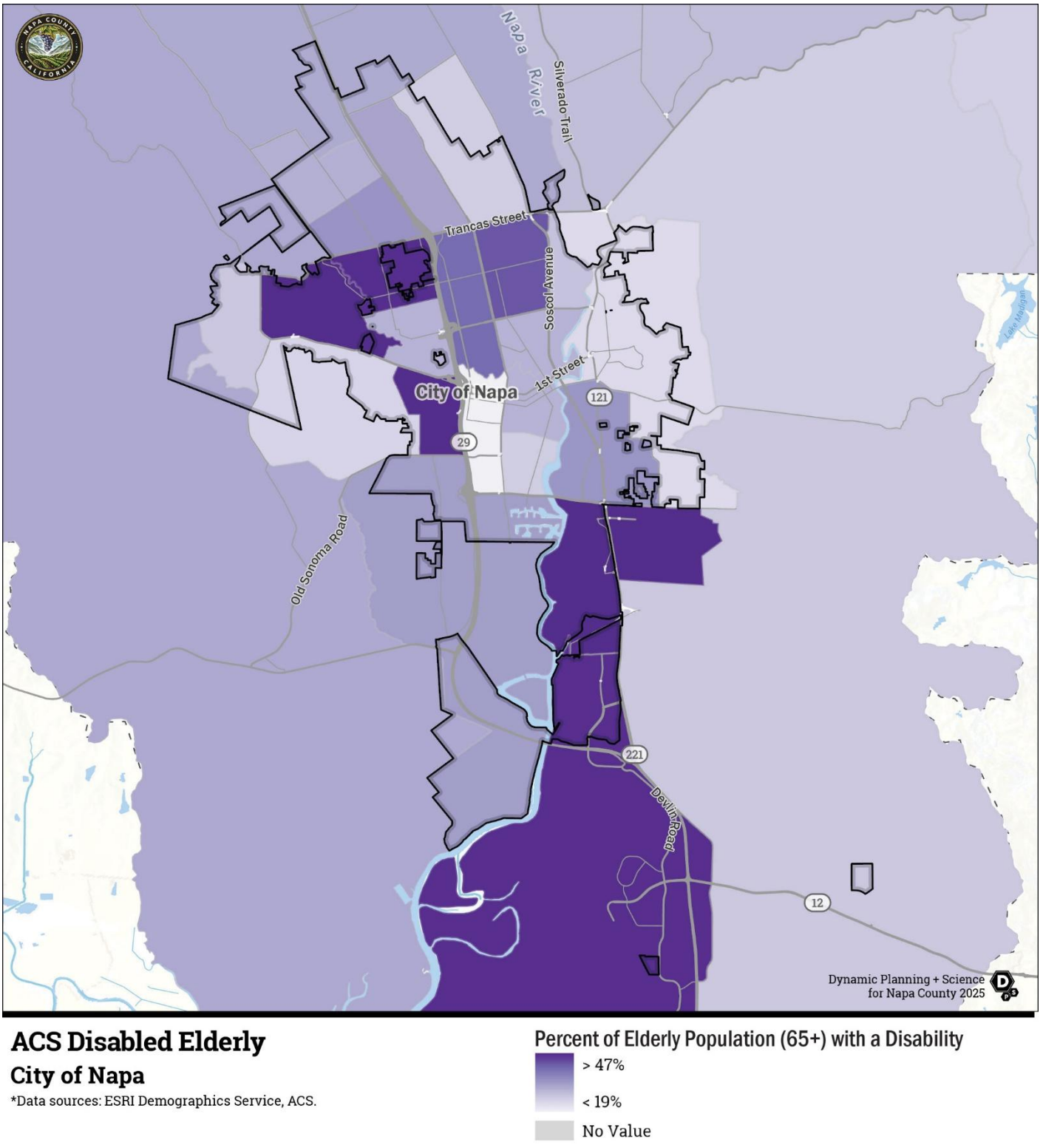


Figure 3-6: City of Napa Disabled Elderly Map

3.2.2.3 Race, Ethnicity & Language

Natural disasters compound racial disparities; non-white individuals and communities receive less recovery aid from FEMA than their white counterparts, even where the amount of damage is the same. (Howell, Junia; Elliott, James R., 2019) (National Advisory Council, 2020) These disparities are evidence of the complicated relationship between disaster recovery and overlapping social vulnerabilities including race, income, language, and health. Black and Latino residents are more likely to be low income and renters, conditions which create barriers to navigating FEMA's Individual Assistance programs. Communities with more non-white residents may have lower tax revenue and property values, which means less investment in mitigation and rebuilding efforts before and after an emergency.

Figure 3-7 depicts the racial and ethnic composition within the City of Napa. According to ACS data, the population is predominantly White across much of the city, with notable concentrations of Hispanic or Latino residents in central and southern areas and Asian populations in the eastern portions of the planning area.

Residents with limited English proficiency (LEP) face heightened barriers to understanding emergency alerts, accessing preparedness resources, and navigating post-disaster recovery programs. In Napa, approximately 20% of households speak Spanish, but only around 3% report limited English proficiency. (Table 3-7). Figure 3-8 highlights where Spanish-speaking populations are concentrated in Napa.

Table 3-7: City of Napa Household Languages

Jurisdiction	Households (HH)	Spanish Speaking	%	Limited English	%	Other Lang.	%
Napa County	55,588	8,738	15.7%	2,141	3.9%	12	0.0%
City of American Canyon	5,924	1,069	18.0%	177	3.0%	-	0.0%
City of Calistoga	2,330	474	20.3%	63	2.7%	-	0.0%
City of Napa	**31,666**	**5,800**	**18.3%**	**1,653**	**5.2%**	**9**	**0.0%**
City of St. Helena	2,963	370	12.5%	88	3.0%	-	0.0%
Town of Yountville	1,824	49	2.7%	21	1.2%	-	0.0%

Source: ACS 5-Year, 2017-2022

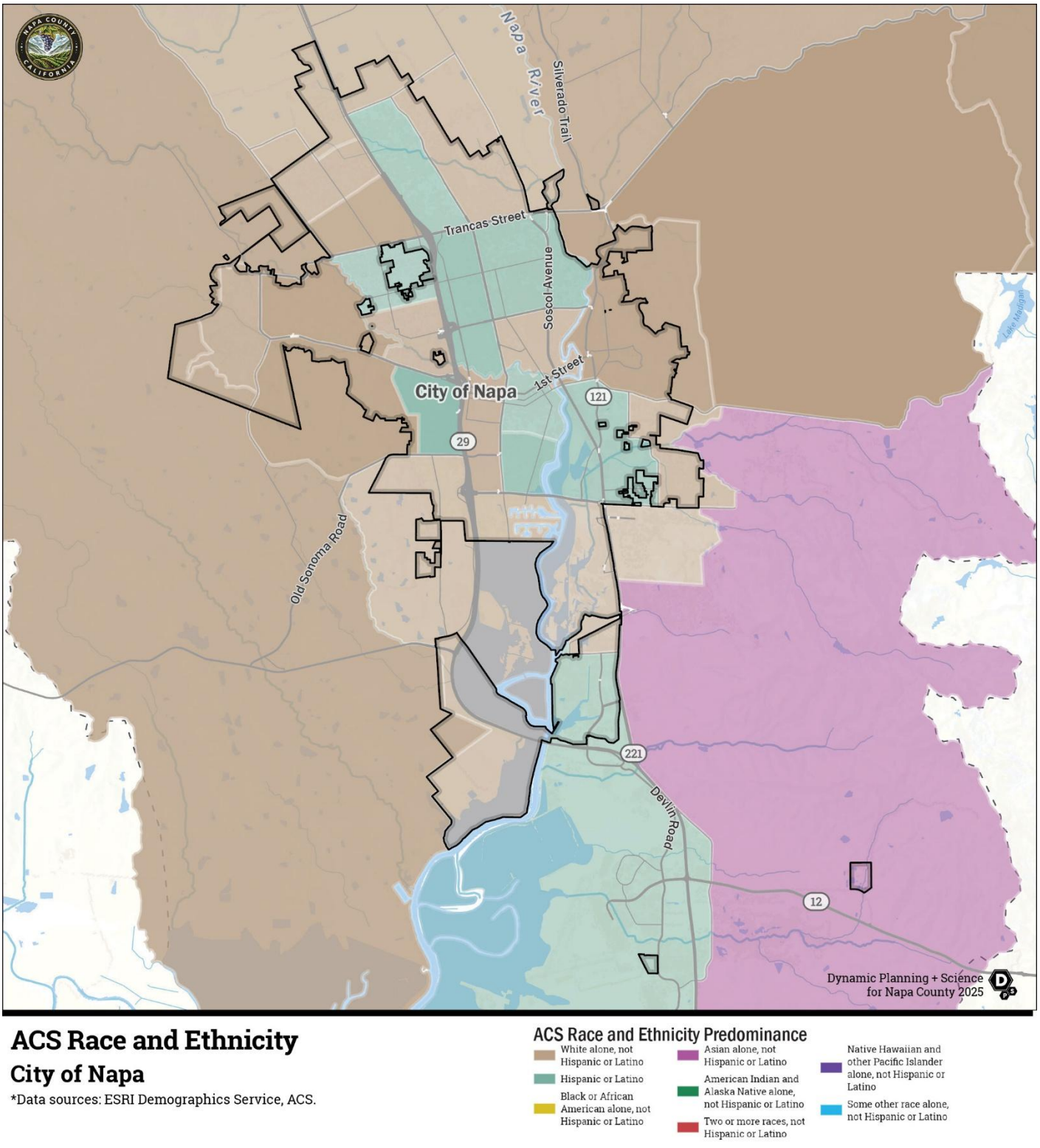


Figure 3-7: City of Napa Race and Ethnicity Map

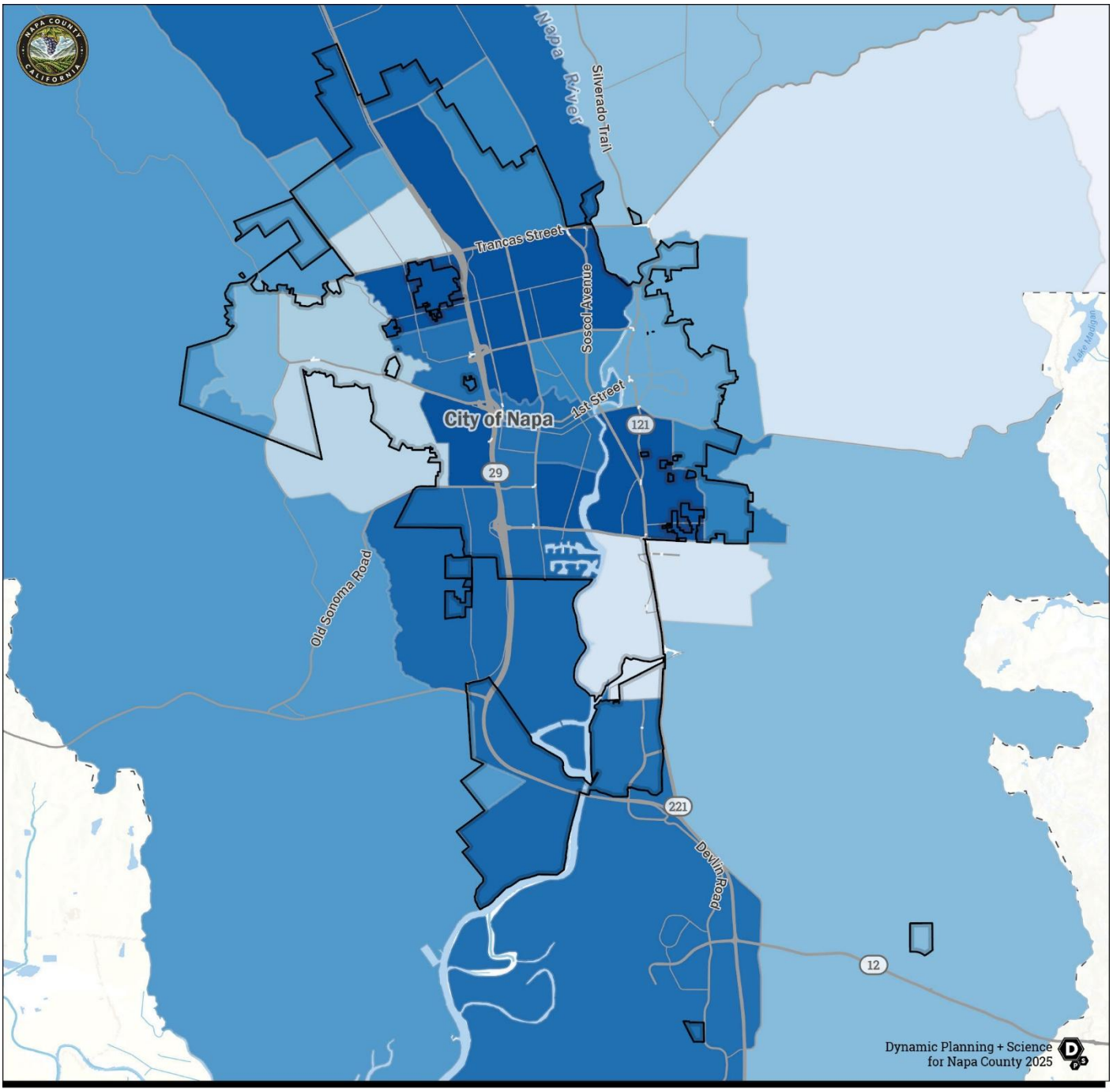


Figure 3-8: City of Napa Spanish-Speaking Households Map

3.2.2.4 Social Vulnerability Index (SVI)

The Centers for Disease Control and Prevention (CDC) Social Vulnerability Index (SVI) for City of Napa reveals important spatial and demographic patterns that have direct implications for equitable hazard mitigation planning. As discussed in detail in Volume 1, Section 1.5.3.6, the SVI is a composite measure developed by the CDC to identify communities that are more likely to require support before, during, and after a disaster. It incorporates a range of factors across four key dimensions: socioeconomic status, household composition and disability, minority status and language, and housing type and transportation access. The resulting index score ranges from 0 (lowest vulnerability) to 1 (highest vulnerability).

Figure 3-9 illustrates that social vulnerability in the City of Napa ranges from low to high (0.0 to 1.0), with most areas exhibiting moderate to moderately high SVI values. Higher SVI scores, indicating populations with reduced capacity to prepare for, respond to, and recover from hazard events, are primarily concentrated along the central north–south corridor of the city, generally following the Highway 29 and Napa River alignment. These areas reflect overlapping vulnerability factors such as lower income levels, higher proportions of renters, limited vehicle access, language barriers, and greater concentrations of elderly or disabled residents. In contrast, lower SVI values are more prevalent in outlying western, northeastern, and southeastern portions of the city, where populations may have greater access to resources and adaptive capacity.

The spatial pattern suggests that socially vulnerable populations are clustered in the urban core, increasing the potential for disproportionate impacts during hazard events such as flooding, extreme heat, earthquakes, and wildfire smoke episodes. Given the proximity of many higher-SVI areas to known flood-prone zones along the Napa River, these populations may face compounded risks. Additionally, residents in these areas may encounter greater challenges in accessing emergency information, evacuation resources, sheltering options, and post-disaster recovery assistance, particularly during complex or prolonged hazard events.

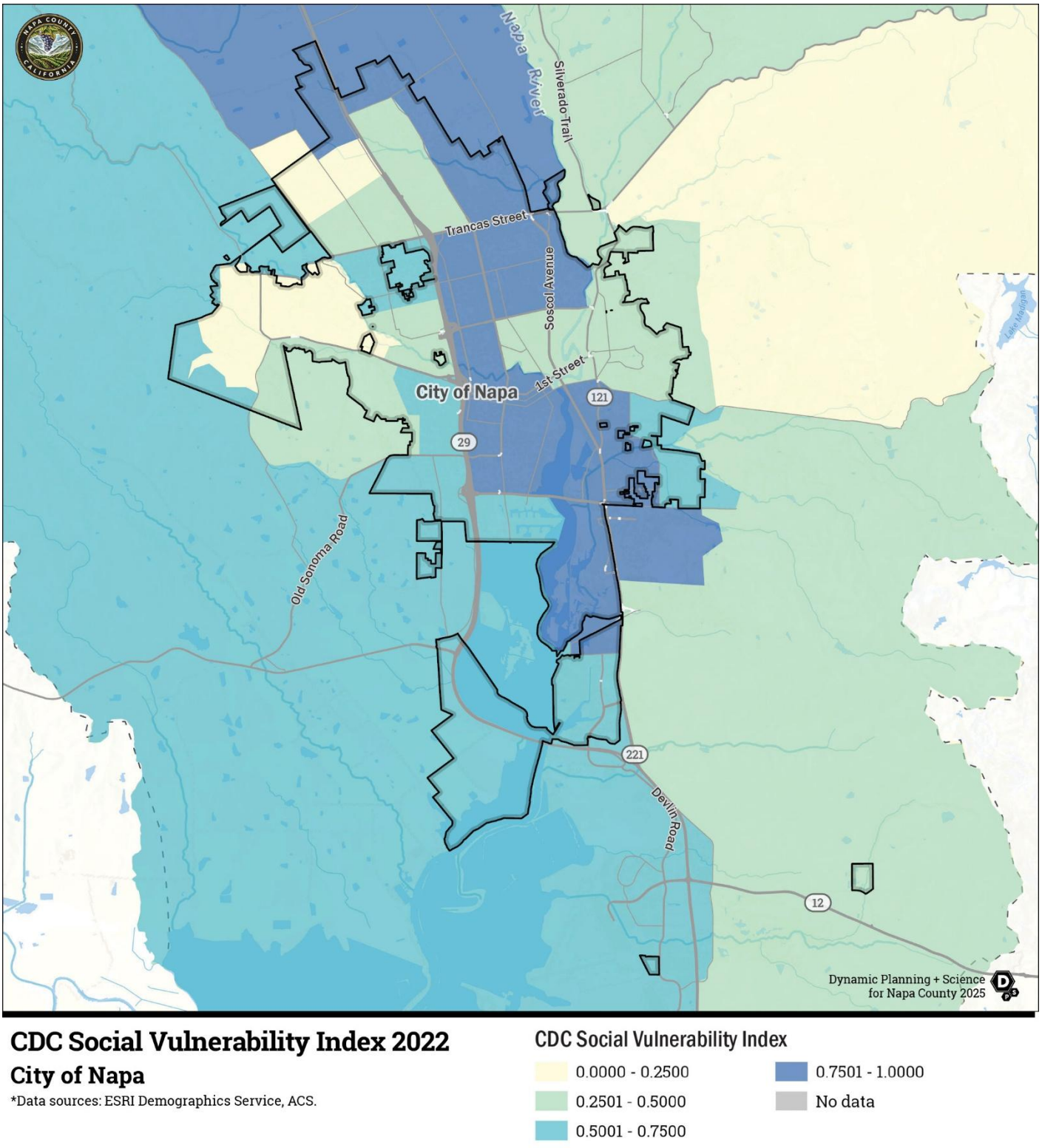


Figure 3-9: City of Napa CDC Social Vulnerability Index Map

3.2.3 Economy

The City of Napa serves as the primary economic center of Napa County, functioning as a regional hub for employment, commerce, government services, and tourism. The local economy is diverse, with key sectors including hospitality, wine production, retail, healthcare, and professional services. Napa's location along major transportation corridors, including State Route 29 and State Route 121, reinforces its role as a central node for economic activity within the Napa Valley.

Commercial activity is concentrated in several key areas, including the downtown core, major commercial corridors such as Trancas Street and Soscol Avenue, and neighborhood-serving retail centers distributed throughout the city. These areas support a mix of visitor-serving businesses, restaurants, retail establishments, and essential services that contribute significantly to local tax revenues and employment opportunities. The concentration of economic activity within these corridors underscores the importance of protecting critical infrastructure, transportation networks, and utility systems from hazards such as flooding, earthquakes, wildfire smoke, and power outages.

Napa's economy includes a strong base of small and locally owned businesses that support both residents and visitors. These businesses are particularly sensitive to hazard-related disruptions, as temporary closures, infrastructure damage, or reduced accessibility can lead to immediate revenue loss and longer-term economic impacts. Given the City's reliance on tourism and hospitality, disruptions during peak visitor seasons can have amplified economic consequences. Ensuring business continuity and rapid recovery is therefore a key consideration in hazard mitigation planning.

A substantial portion of Napa's workforce is employed in service-oriented and outdoor sectors, including hospitality, agriculture, construction, and maintenance. Workers in these industries may face increased exposure to hazards such as extreme heat, wildfire smoke, and poor air quality. Projected increases in the frequency and severity of heat events and wildfire conditions due to climate change have implications for worker health and safety, as well as overall economic productivity.

Economic vulnerability within the city is also influenced by income variability and employment stability, particularly among workers in hourly or service-based positions. Disaster-related closures, evacuations, or infrastructure disruptions can result in immediate income loss for these populations, potentially exacerbating household vulnerability and slowing community recovery. As such, protecting employment centers, maintaining reliable transportation access, and ensuring continuity of utilities, communications, and emergency services are essential strategies for reducing economic disruption and enhancing resilience in the City of Napa.

3.2.4 Growth Trends & Future Development

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3.3 Planning Process

The City of Napa followed the planning process detailed in Volume 1, Section 2, including participating in the county-wide Hazard Mitigation Planning Team (HMPT) and formulating their own internal planning team to support the broader planning process.

The city's representatives in the Steering Group led stakeholder and public engagement efforts alongside the Consultant Team, with assistance from the county-wide HMPT and their internal planning team. This engagement process is described in Volume 1. Specifically, for the City of Napa, this included postings to the city website and social media, and outreach events, as documented in Appendix B. Examples of Key

Stakeholders engaged by Napa County on behalf of the city with relevance to the development of Napa's mitigation strategy include the USDA and other federal agencies; CAL FIRE and other state agencies; other neighboring jurisdictions; community-based organizations such as the Chamber of Commerce; utility providers like PG&E; UC Davis and other academia; and local businesses.

All Key Stakeholders that were invited to participate in the planning process are listed in Volume 1, Section 2, and the input received from stakeholders was integrated into the city's annex, as described in Volume 1 Table 2-9. The city's internal planning team participants, their positions, and how they participated in the planning process are shown in Table 3-8.

Table 3-8: City of Napa Planning Team and Steering Group Members

Stakeholder	Title	Department	CRS Expertise1	Description of Involvement
Zach Curren	**Fire Chief**	**Fire Dept.**	**Emergency Services, Preventive measures (e.g., codes)**	**Jurisdictional Lead, Attended Kick-Off Meeting, HMPT Meeting #2, & 3, Jurisdictional Breakout Meeting #2**
Charles Rhodes	Battalion Chief – (former participant)	Fire Dept.	Emergency Services, Preventive measures (e.g., codes)	Attended Kick-Off Meeting, HMPT Meeting #1, Jurisdictional Breakout Meeting #1
Julie Lucido	Public Works Director	Public Works Dept.	Property Protection, Structural flood control projects	Attended Jurisdictional Breakout Meeting #1 & #2
Doug DeMaster	Senior Civil Engineer	Public Works Dept., Water Division	Structural flood control projects, Property Protection,	Attended Jurisdictional Breakout Meeting #1 & #2
Jaina French	Community Relations & Media Manager	City Manager's Office	Public Education and Awareness	Attended Jurisdictional Breakout Meeting #1 & #2
Jeff Gittings	Parks and Urban Forestry Manager	Parks & Recreation Services	Preventative Measures, Natural resource protection	Attended Jurisdictional Breakout Meeting #2
Michael Walker	Senior Planner	Community Development Dept.	Preventative Measures	Attended Breakout Meeting #2
Jason Williams	Chief Building Official	Building Dept.	Preventive measures (e.g., codes)	Attended Breakout Meeting #1 & #2
Matthew Price	Public Works Maintenance Superintendent	Public Works Dept.	Property protection (e.g., elevation)	Attended Breakout Meeting #2

Stakeholder	Title	Department	CRS Expertise1	Description of Involvement
Michael Cahill	Emergency Planning	MPCahill Solutions LLC	Emergency Services	Attended HMPT Meeting #3
Kristopher Jenny	Lieutenant - Administration	Police Department	Emergency Services	Attended Breakout Meeting #2
Molly Rattigan	Deputy City Manager/Interim Community Development Director	City Manager's Office & Community Development	Preventive measures (e.g., codes)	Attended Breakout Meeting #2
Vincent Smith	Community Development Director-Former	Community Development Dept.	Preventive measures (e.g., codes)	Attended Breakout Meeting #1
Jason Berens	Deputy Chief	Fire Dept.	Emergency Services	Attended Breakout Meeting #1
Paul O'Neill	*Associate Planner*	*Planning Division*	*Preventive measures (e.g., codes)*	*No Participation to Date*
Brandon Veyna	*Fire Prevention/Inspector*	*Fire Dept.*	*Emergency Services, Preventive measures (e.g., codes)*	*No Participation to Date*
Ed Moore	*Engineering Assistant*	*Transportation Engineering*		*No Participation to Date*
Joy Eldredge	*Deputy Utilities Director*	*Utilities Dept.*	*Property protection (e.g., elevation)*	*No Participation to Date*
Stephanie Emmons	*Stormwater Program Coordinator*	*Development Engineering*	*Property protection (e.g., elevation)*	*No Participation to Date*
Magdiel Frayre	*Parks, Trees & Facilities Supervisor*	*Parks, Trees & Facilities Dept.*	*Natural Resource Protection*	*No Participation to Date*
Ed Moore	*Engineering Assistant*	*Transportation Engineering*	*Natural Resource Protection*	*No Participation to Date*

1 The Community Rating System (CRS) categories of flood mitigation activities presented in this table are included for personnel cross-reference purposes only to support alignment with National Flood Insurance Program (NFIP) CRS crediting criteria. These categories are intended to assist in identifying departmental roles and expertise relevant to CRS activities and in maximizing CRS credit under Activity 510 (Floodplain Management Planning), including credit for multi-departmental involvement. Consistent with FEMA mitigation planning guidance (44 CFR § 201.6), mitigation actions included in this plan are those that reduce or eliminate long-term risk to people and property from natural hazards; therefore, activities associated solely with emergency response or short-term preparedness are not classified as mitigation actions.

The City of Napa participated in a comprehensive hazard mitigation planning process as part of the 2026 Napa County MJHMP update. This included a series of breakout meetings that engaged the city's planning team, which included key city personnel and stakeholders in evaluating hazards, identifying local vulnerabilities, and prioritizing mitigation strategies.

On September 25, 2024, the City of Napa held its first breakout session, which focused on the progress of the city's hazard mitigation planning efforts. This meeting emphasized Napa's role within the multi-jurisdictional framework and highlighted the need for sustained participation from major city departments and regional partners. Discussions included the increasing frequency and severity of natural disasters and the critical role of planning in reducing risk. The group reviewed newly released hazard data and addressed concerns about inaccuracies in updated CAL FIRE wildfire hazard maps, underscoring the importance of reliable data and state-level coordination to improve local risk modeling.

Building on this initial meeting, the City Planning Team reviewed historical hazard impacts, assess ongoing development trends, and evaluate the city's capabilities and gaps in risk reduction. The breakout session included the development of a localized risk matrix to prioritize the hazards affecting the city, tailored to Napa's unique geography and built environment, and laid the foundation for identifying hazard-specific problem statements and mitigation actions.

On June 12, 2025, the City of Napa convened Breakout Meeting #2 as part of the ongoing update to the Napa County Multi-Jurisdictional Hazard Mitigation Plan. This session built upon the foundational work of the initial breakout meeting by advancing the development of the mitigation strategy and refining priority actions. Discussions focused on evaluating and consolidating the City's existing mitigation actions to ensure they are actionable, aligned with current funding opportunities, and consistent with FEMA guidance for implementable and maintainable plans (44 CFR § 201.6(c)(3)).

City staff and the Planning Team reviewed ongoing and proposed projects addressing key hazards such as flooding, wildfire, earthquake, erosion, and severe weather. Particular attention was given to aligning mitigation actions with available and anticipated funding sources, including state and local programs, in response to evolving federal funding conditions. The group emphasized the importance of developing specific, measurable, and feasible mitigation actions, consistent with FEMA's Local Mitigation Planning Handbook (Task 6: Develop a Mitigation Strategy), and explored opportunities to integrate equity considerations and cross-agency coordination into project design.

The meeting also included refinement of the hazard profile by removing lower-priority hazards (e.g., pandemic and agricultural disaster) and clarifying the inclusion of others such as dam failure and severe weather, based on local conditions and recent events. Additionally, participants discussed strategies to enhance public engagement, including expanding outreach efforts and increasing participation in the community survey to support compliance with stakeholder involvement requirements under 44 CFR § 201.6(c)(1).

Overall, Breakout Meeting #2 marked a transition from risk identification toward implementation-focused planning, ensuring that the City of Napa's mitigation strategy remains data-driven, fiscally realistic, and aligned with both local priorities and state and federal mitigation frameworks.

These efforts built upon the county-wide meetings held between February 2024 and June 2025, which introduced the MJHMP update process, defined the roles of the Steering Group and city planning team, and outlined the timeline and deliverables for each participating jurisdiction. In addition to Napa's own session, previous workshops conducted on September 9, 2024, and June 12, 2025, introduced the hazard prioritization methodology, explored funding eligibility under the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Assistance (HMA) programs, and refined jurisdictional mitigation strategies.

Throughout this planning process, the City of Napa has remained focused on aligning its goals with FEMA standards, maintaining eligibility for federal mitigation funding, and incorporating updated risk data into planning and policy documents. These localized efforts are documented in this annex as well as in Volume 1 of the 2026 MJHMP. Table 3-9 shows meeting records for the City of Napa Planning Team. Steering Group and county-wide HMPT meetings are documented in Volume 1, Section 2.

Table 3-9: City of Napa Planning Team Meetings

Meeting & Date	Agenda / Topics	Goals / Key Inputs
County-Wide Steering Group and HMPT Kick-off and Meetings #1 & #2 February 28, 2024– July 18, 2024		
City of Napa Planning Team Breakout Meeting #1 September 25, 2024	▪ County-wide HMPT meetings #1 thru #3 recap ▪ Community engagement progress and results ▪ Risk assessment and community vulnerability ▪ Demographics and vulnerable populations ▪ Overview of jurisdiction-specific hazard risks and exposure ▪ Introduction to Risk Assessment Mapping Platform (RAMP) ▪ Jurisdiction-specific hazard risk ranking exercise ▪ Project schedule updates and next steps	▪ Consensus on jurisdiction-specific priority hazards ▪ Identify capabilities and potential mitigation actions ▪ Community engagement volunteers
County-Wide HMPT Meeting #3 March 25, 2025		
City of Napa Planning Team Breakout Meeting #2 June 12, 2025	▪ Breakout meeting #1 recap ▪ Community engagement progress and results ▪ Review areas of concern and define problem statements ▪ Principles of effective mitigation strategies and actions, and mitigation alternatives ▪ Refine and align jurisdiction-specific mitigation actions exercise ▪ Project schedule updates and next steps	▪ Consensus on jurisdiction-specific areas of concern and problem statements ▪ Identify priority mitigation actions ▪ Community engagement volunteers
County-Wide HMPT Meeting #4 December 10, 2025		

3.3.1 Public Input & Draft Review

As detailed in Volume 1, Section 2, the draft plan was available for public review and comment from May 15 to June 2, 2026. Public comments received during that time were similar to those gathered throughout the public engagement process, including the need for more equity in the distribution of mitigation activities and funding and the need for enhanced cooperation among jurisdictions, utility providers, and state agencies. These comments were incorporated into the city's mitigation strategy, as appropriate; although, most were already addressed by the Mitigation Action Plan which was based on previous public input.

Public and stakeholder input was gathered and incorporated throughout the plan development process, before the public review period, such as from the online public survey (see Volume 1, Section 2.1.2 and Appendix B, for details). During the review period, jurisdictional staff and stakeholders that participated in the plan development also reviewed the public draft and provided comments on minor corrections and revisions, which were addressed in the final plan.

3.4 What's New

Since the City of Napa adopted its 2021 Local Hazard Mitigation Plan (LHMP), the City has actively pursued strategies to reduce natural hazard risks to life and property, demonstrating its commitment to resilience and preparedness. A comprehensive reevaluation of the mitigation actions outlined in the 2021 LHMP, has guided the city's progress.

3.4.1 Mitigation Activities

The city has successfully implemented several initiatives aimed at addressing identified vulnerabilities. Some of these accomplishments are highlighted in this section and have directly contributed to reducing risks from hazards such as flooding, all hazards, and severe weather. These completed projects showcase Napa's ability to effectively plan, fund, and execute measures that protect its residents and infrastructure.

In addition, Napa has systematically reviewed and adjusted its mitigation actions, exemplifying adherence to FEMA's Planning Policy Guide principles and emphasizing the importance of dynamic and adaptive mitigation planning. By fostering partnerships, leveraging funding opportunities, and prioritizing equity in implementation, the city aligns with best practices to build resilience against natural disasters. This ongoing effort is a testament to the city's commitment to the principles of risk-informed decision-making, equitable resource allocation, and integration with broader regional and state hazard mitigation objectives.

Adjustments to Previous Mitigation Actions

A significant portion of the city's mitigation efforts remain ongoing or in the pipeline. These actions, ranging from infrastructure upgrades to community outreach initiatives, represent the city's proactive approach to addressing hazards as resources become available.

Recognizing constraints such as limited funding, staffing, and shifting priorities, the city has reevaluated certain initiatives, leading to their reprioritization or canceling of mitigation actions. Factors such as feasibility, cost-effectiveness, and emerging risks informed these decisions, ensuring alignment with the city's updated hazard mitigation goals. Adjustments to previous mitigation actions are documented as part of the City of Napa's Mitigation Action Plan Table 3-18, and more specific status updates are provided in Table 3-19.

3.4.2 Successes Since 2021

Since the adoption of the 2021 Hazard Mitigation Plan, the City of Napa has made measurable progress in implementing mitigation actions that reduce risk and enhance community resilience. These successes reflect the City's continued commitment to integrating hazard mitigation into local planning, capital improvement projects, and community programs.

The following success stories highlight completed and ongoing efforts that address key hazards such as wildfire, flooding, and infrastructure vulnerability. Collectively, these initiatives demonstrate Napa's ability to move from planning to implementation by leveraging partnerships, securing funding, and advancing projects that provide long-term risk reduction benefits to the community.

City of Napa Community Wildfire Protection Plan (CWPP)

The City of Napa's Community Wildfire Protection Plan (CWPP) is a strong example of translating wildfire risk into effective, community-driven mitigation action. Through collaboration with local fire agencies, Napa County, and community stakeholders, the City identified high-risk areas and prioritized strategies to reduce wildfire impacts in the wildland-urban interface. This plan is anticipated to be adopted in June 2026.



Key accomplishments include expanded vegetation management and defensible space programs, which reduce fuel loads and improve emergency access. The City has also advanced home hardening efforts and public outreach campaigns, helping residents better protect their properties from wildfire hazards.

In addition, the CWPP supports improvements to evacuation planning and coordination with regional partners and utility providers, strengthening overall emergency preparedness. The City has aligned these actions with available grant funding, ensuring that projects are both feasible and sustainable.

Overall, the CWPP demonstrates Napa's commitment to proactive wildfire mitigation by combining planning, community engagement, and targeted investments to reduce risk and enhance resilience.

Napa River / Napa Creek Flood Control

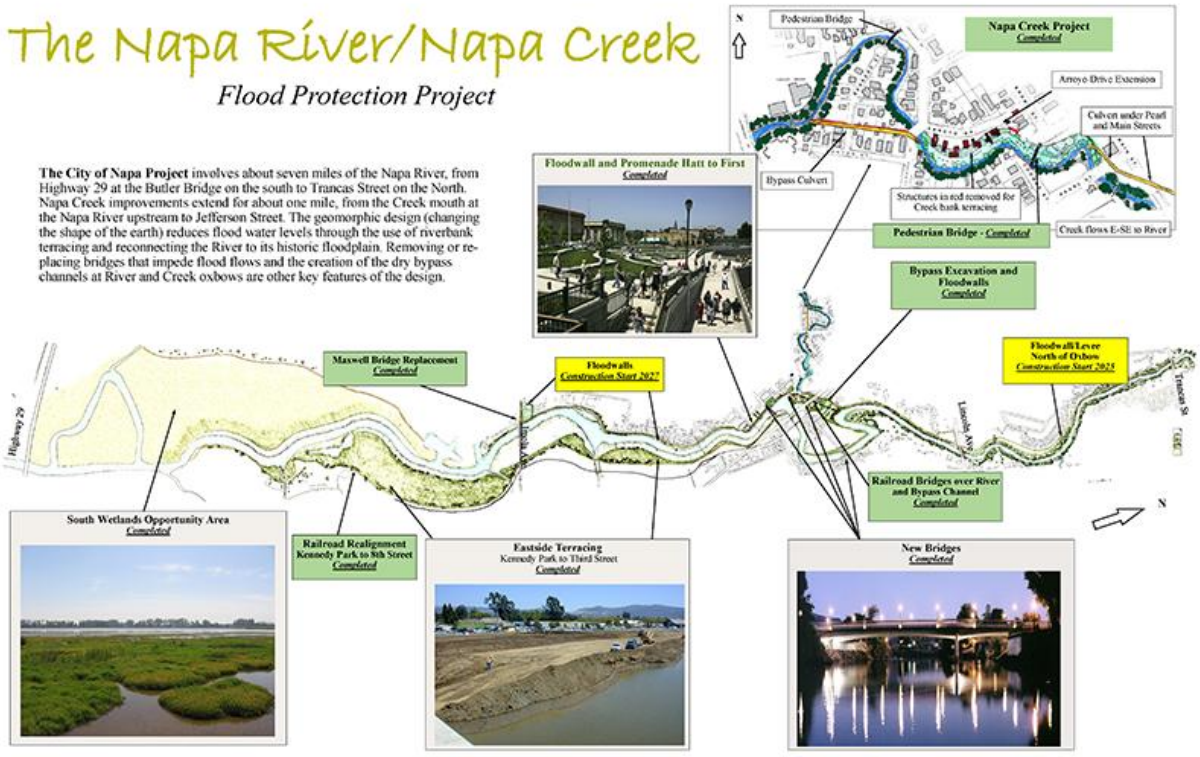
The Napa River & Creek Flood Protection Project represents a landmark achievement in reducing flood risk and enhancing resilience throughout the City of Napa. Developed through a collaborative partnership between the City, Napa County Flood Control and Water Conservation District, and federal and state agencies, the project reflects a long-term commitment to addressing one of the community's most significant natural hazards.

A key success of the project is the implementation of a "living river" approach, which combines traditional flood control infrastructure with natural channel design. Improvements such as widened floodplains, restored wetlands, and stabilized riverbanks have increased the system's capacity to manage high flows while also enhancing ecological function and public open space. These nature-based solutions reduce flood risk while providing co-benefits including habitat restoration, recreation, and improved water quality.

The project has significantly reduced the risk of flooding for thousands of properties, critical facilities, and infrastructure in Napa's urban core. In addition, targeted improvements along tributary creeks have addressed localized flooding and erosion issues, further strengthening system-wide resilience.

Beyond physical improvements, the project demonstrates successful integration of mitigation into broader community planning. By leveraging multiple funding sources and maintaining strong interagency coordination, Napa has implemented a scalable and sustainable flood risk reduction strategy.

Overall, the Napa River & Creek Flood Protection Project stands as a model for innovative flood mitigation, showcasing how integrated, multi-benefit solutions can protect communities while enhancing environmental and social value.



3.5 Risk Assessment

This section focuses on profiling hazards specific to the City of Napa and assessing their vulnerability independent of the broader county-wide planning area, which has been evaluated in Section 3 of Volume 1. The hazard profiles in Volume 1 discuss overall impacts to the planning area and describe relevant plans, policies, and regulations; past events; location; frequency and probability of future occurrences; severity and extent; warning time; secondary hazards; and climate change impacts. For more information on risk assessment methodologies, see Volume 1, Appendix A.

This section includes a tailored vulnerability assessment, analyzing assets at risk such as population, property, and critical facilities and infrastructure unique to the city, and information on city-specific differences in hazard vulnerability across the planning area. It also identifies total city assets at risk, including people, property, and critical facilities and infrastructure within the city. In addition, this section presents growth and development trends for the community, offering insights into vulnerabilities and risks that represent the broader context of assets at risk.

3.5.1 Hazard Screening & Prioritization

Members of the Planning Team from each participating jurisdiction came together to collaboratively decide which county-wide hazards would be included in the MJHMP, and which would be excluded. Hazard screening and prioritization took place early in the process and integrated historic data, local knowledge, and consensus opinions to create a risk assessment matrix for the county as well as for each participating jurisdiction. These matrices indicate the priority of hazards prior to further refinement. Details about this process, the results of the discussion, and in-depth profiles for county-wide hazards can be found in Volume 1, Sections 2 and 3.

The final results of the hazard screening and prioritization exercises are summarized in Table 3-11, including which specific subhazards were selected by Napa's Planning Team.

The City of Napa's internal planning group used the same hazard identification and prioritization process as the county-wide Planning Team. They reviewed previously prepared hazard mitigation plans and other relevant documents to determine the realm of natural hazards that have the potential to affect the city. Table 3-10 provides a crosswalk of hazards identified in select planning documents, including the 2020 Napa County MJHMP, the City of Napa's General Plan, and the 2023 State of California HMP. The crosswalk was used to develop a preliminary hazards list, providing a framework for the group to evaluate which hazards were truly relevant to the City of Napa and which ones were not.

The internal planning group then ranked hazards based on their probability of affecting City of Napa and potential impacts on the community. Figure 3-10 displays the results of the hazard risk ranking exercise that was performed before further refinement. All hazards have been profiled in Volume 1 of this document. The purpose of this annex is to specifically address the city's vulnerability to specifically identified hazards.

Table 3-10: City of Napa Document Review of Potential Hazards

Hazard	2020 Napa County MJHMP	City of Napa General Plan	2023 California SHMP
Agricultural Pests	■		■
Avalanche			■
Climate Change	■	■	■
Coastal			■
Dam Failure	■		■
Drought	■	■	■
Earthquake / Liquefaction	■	■	■
Extreme Cold			■
Extreme Heat		■	■
Extreme Weather / Storms	■	■	■
Flood	■	■	■
Geologic / Mass Movement	■	■	■
Human-Caused		■	■
Insects			■
Levee Failure			■
Pandemic Disease	■		■
Sea Level Rise			■
Soil			■
Subsidence			■
Tornado			■
Tsunami / Seiche Wave			■
Volcano			■
Wildfire	■	■	■

Risk Assessment Matrix Definitions

PROBABILITY RATING

The likelihood of a hazard event occurring within a time period?

PROBABILITY

Highly Likely	**Highly likely** - 100% annual probability. Or Likely to occur every year in your lifetime.
Likely	**Likely** - between 10 & 100% annual probability. Or will occur several times in your lifetime.
Possible	**Possible** - between 1 & 10% annual probability. Or Likely to occur some time in your lifetime.
Unlikely	**Unlikely** - less than 1% annual probability. Or unlikely but possible to occur in your lifetime.

IMPACT RATING

In terms of injuries, damage, or death, would you anticipate impacts to be minor, limited, critical, or catastrophic when a significant hazard event occurs? The impact could be in terms of one hazard event (flooding from a culvert failure) or a large-scale event (multiple rivers flooding) in the same jurisdictional boundary.

IMPACT

Minor	Limited	Critical	Catastrophic

Minor - very few injuries, if any. Only minor property damage & minimal disruption on quality of life. Temporary shutdown of critical facilities.

Limited - minor injuries only. Approx. 10% or less of property in disaster footprint damaged or destroyed. Complete shutdown of critical facilities for more than one day.

Critical - multiple deaths/injuries possible. Between 25% and 50% of property in disaster footprint is damaged or destroyed. Complete shutdown of critical facilities for more than one week.

Catastrophic - high number of deaths/injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for 30 days or more.

To concentrate resources, the jurisdictional planning team will focus on "High" and "Extreme" risk hazards, and "Medium" risk hazards to a lesser extent. These hazards have the higher probability and greater impact as it relates to the higher jurisdictions planning area.

Hazard definitions are included in **Vol. 1** of this plan. Some hazards are discussed as subset hazards— e.g., "Levee Failure" within the "Flood" hazard profile. If a hazard is not present on the risk matrix, is grey, or categorized as a "Low" risk hazard, the jurisdictional planning team felt the hazard had a minimal footprint or impact within their planning area and chose not to profile the hazard.

Hazard Information / Legend:



Climate Change impacts will be addressed within each relevant hazard section within the plan update and as a stand alone section for each jurisdiction. Climate change may change the frequency, duration, or intensity of other hazards profiled.

City of Napa Risk Matrix

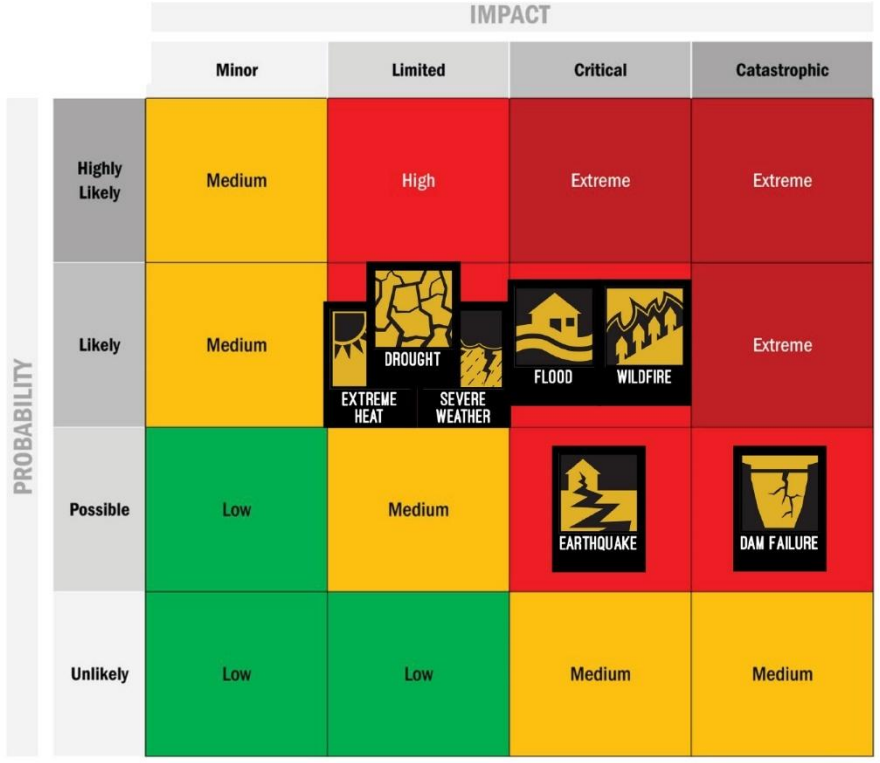


Figure 3-10: City of Napa Risk Assessment Matrix

Note: Hazard naming in the Risk Assessment Matrix may not match the final naming used. Refer to hazards prioritization summary table.

Priority Hazards

The results of the initial risk ranking exercise completed by the city's Planning Team, before further refinement, are identified in the county's completed matrix in Figure 3-10. Table 3-11 provides the final list of priority hazards and subhazards with additional details about why certain hazards were chosen and why others were not prioritized. However, it should be noted that many hazards not prioritized for profiling are briefly discussed as secondary or compounding hazards, and subhazards that were profiled and included in the risk assessment are listed specifically.

Table 3-11: City of Napa Hazards Prioritization Summary

Hazard	Priority	Explanation
Earthquake / Liquefaction	**High**	Profiled in Volume 1, Section 3.3.4, and Section 0 in this annex, including Liquefaction
Wildfire	**High**	Profiled in Volume 1, Section 3.3.1, and Section 3.5.2.1 in this annex
Flood	**High**	Profiled in Volume 1, Section 3.3.2, and Section 3.5.2.3 in this annex, including Levee Failure
Levee Failure	**High**	Profiled in Volume 1, Section 3.3.2, and Section 3.5.2.3 in this annex under Flood
Extreme Weather / Storms	**High**	Profiled in Volume 1, Section 3.3.5, and Section 3.5.2.6 in this annex as Severe Weather, including High Wind and Heavy Rain (Winter Weather not a priority due to low probability and impact potential)
Drought	**High**	Profiled in Volume 1, Section 3.3.6, and Section 3.5.2.5 in this annex
Geologic / Mass Movement	-	Profiled in Volume 1, Section 3.3.5; not a priority due to low probability and impact potential
Extreme Heat	**High**	Profiled in Volume 1, Section 3.3.8, and Section 3.5.2.7 in this annex
Agricultural Pests	-	Profiled in Volume 1, Section 3.3.9; not a priority due to low probability and impact potential and jurisdictional focus
Sea Level Rise	**High**	Profiled in Volume 1, Section 3.3.9, and Section 3.5.2.8 in this annex under Climate Change
Climate Change	**High**	Profiled in Volume 1, Section 3.3.9, and Section 3.5.2.8 in this annex, including Sea Level Rise, and discussed as a compounding hazard in relevant profiles
Dam Failure	**High**	Profiled in Volume 1, Section 3.3.3, and Section 3.5.2.2 in this annex

3.5.2 Vulnerability to Specific Hazards

Assessing vulnerabilities exposes the unique characteristics of individual hazards and begins the process of narrowing down which areas within the city are vulnerable to specific hazard events. The vulnerability assessment considered unique local knowledge of hazards and impacts and a GIS overlaying method for examining such vulnerabilities in more depth. Using these methods, the city's planning group estimated vulnerable populations, properties, and assets, and potential losses. In addition, the exposure of city assets to drought, geological, earthquake, wildfire and flood hazards were also considered.

Many of the hazard profiles include a snapshot map and damage estimation tables that illustrate the city's vulnerabilities to those specific hazards. These maps assisted the planning group in understanding the hazard exposure of populations, parcels, and critical facilities and infrastructure. Each snapshot map contains an exposure summary that displays the percentage of the population, the improvement and content value of parcels, and the amount of critical infrastructure that is exposed. For hazards without geospatial extents, such as drought and severe weather, narratives are provided instead of exposure maps and tables.

Based on the hazard prioritization exercise, this vulnerability assessment focuses on eight hazards for the City of Napa, some of which encompass sub hazards such as Liquefaction and Heavy Rain

Wildfire
SECTION 3.5.2.1



Flood
SECTION 3.5.2.2



Dam Failure
SECTION 3.5.2.2



Earthquake
SECTION 0



Drought
SECTION 3.5.2.5



Severe Weather
SECTION 3.5.2.6



Extreme Heat
SECTION 3.5.2.7



Climate Change
SECTION 3.5.2.8



3.5.2.1 Wildfire Hazard

Wildfire risk within the City of Napa is primarily concentrated along the peripheral edges of the city, where urban development transitions into surrounding open space, foothills, and vegetated lands characteristic of Napa County. As illustrated in the wildfire risk exposure map (Figure 3-11), the highest concentrations of wildfire hazard are located east and west of the city limits, with Moderate and High hazard zones extending into portions of the City's Sphere of Influence and at the wildland–urban interface (WUI).

The eastern boundary of the City, extending toward the Silverado Trail corridor and adjacent foothill areas, exhibits Moderate to High wildfire hazard. These areas are characterized by grasslands, chaparral, and mixed vegetation that can become highly combustible during Napa's dry summer and fall seasons. Wind-driven fire behavior and topographic influences in these foothill environments increase the likelihood of rapid fire spread. Development patterns near these edges—including low-density residential neighborhoods and transportation corridors—may face elevated risk from ember intrusion, limited evacuation routes, and constrained emergency access, consistent with wildfire risk characteristics identified in the City's Hazard Mitigation Plan.

Similarly, the western and southwestern edges of the City, including areas near the Napa River corridor and transitioning toward Carneros and adjacent open space, show Moderate wildfire hazard exposure. While portions of these areas include wetlands and irrigated agricultural lands that can act as partial fire breaks, seasonal drying of grasses and vegetation—particularly during drought conditions—can contribute to localized wildfire risk. Wind patterns and alignment with open space corridors may further influence fire behavior in these areas.

Within the centralized and more urbanized portions of the City of Napa, wildfire risk is generally lower, with the map indicating minimal exposure to High or Very High hazard categories. Consistent with the exposure summary shown in the map, there are no mapped population, parcel, or critical infrastructure exposures within the Very High wildfire hazard category inside city limits, resulting in exposure rates of approximately zero percent for these asset classes. However, the map identifies localized areas of High hazard exposure, including transportation-related assets, with approximately 25 transportation-related features (7%) located within hazard areas, indicating some vulnerability of critical lifeline infrastructure.

Despite the relatively limited extent of Very High wildfire hazard zones within incorporated city boundaries, wildfire remains a significant planning concern for the City of Napa. The City is directly adjacent to higher hazard areas throughout Napa County, and regional wildfire events—such as those documented in the Napa County Community Wildfire Protection Plan—demonstrate the potential for fires originating outside city limits to impact urban areas through ember cast, smoke, and evacuation demands.

The City recognizes that wildfire risk is influenced not only by mapped hazard zones but also by proximity, connectivity of fuels, and interjurisdictional fire behavior. Climate change is expected to exacerbate these conditions through increasing temperatures, prolonged drought, and more frequent extreme weather events, contributing to longer fire seasons and more severe wildfire behavior across Napa County.

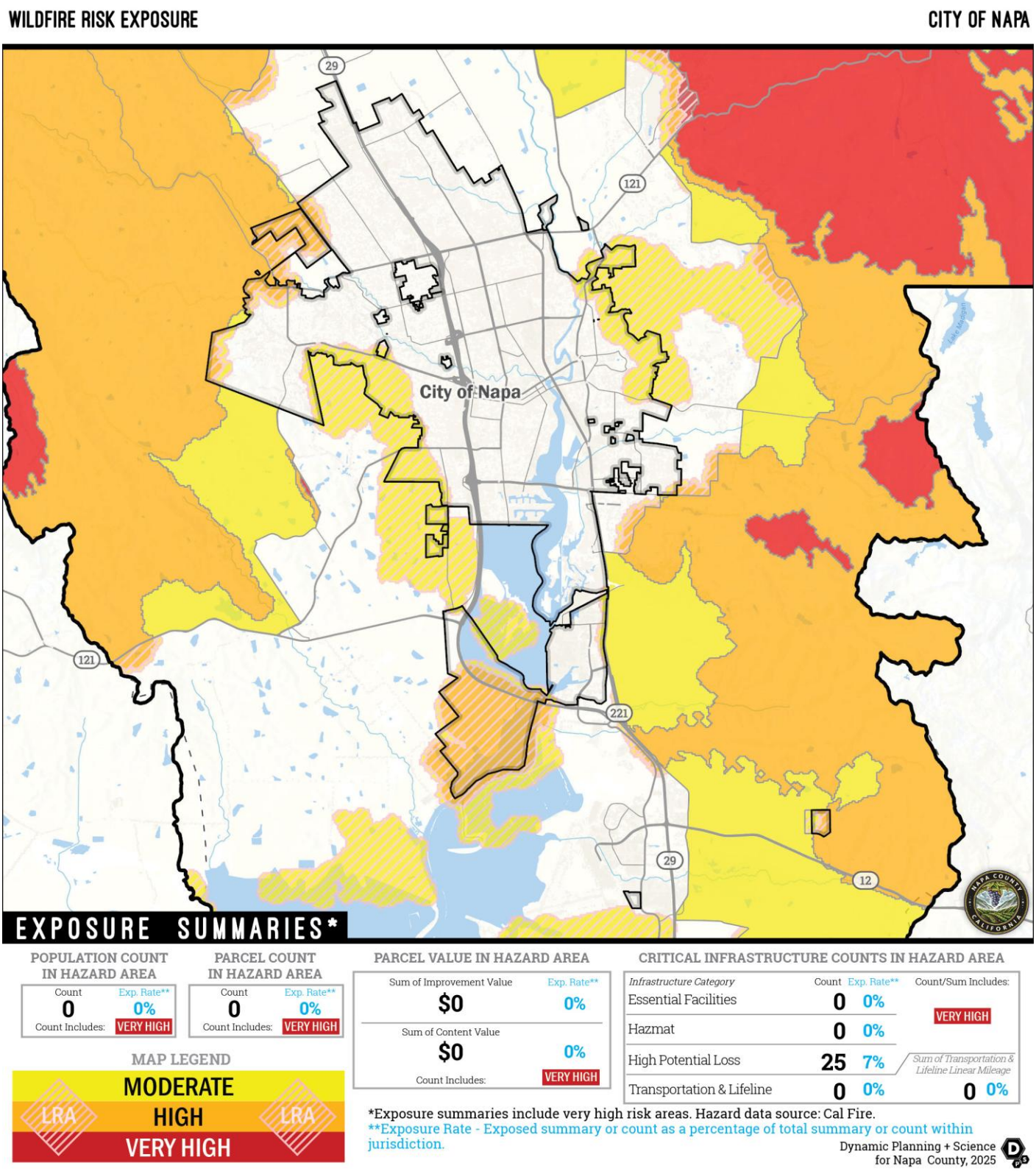


Figure 3-11: Exposure Summary- City of Napa Wildfire Risk

3.5.2.2 Dam Failure Hazard

Dam failure represents a low-frequency but potentially high-consequence hazard within the City of Napa. Dam failure refers to the partial or complete structural failure of an upstream dam, resulting in the uncontrolled release of stored water and rapid downstream inundation. As shown in Figure 3-12, portions of the city are located within mapped dam inundation zones, primarily along the Napa River corridor and extending into low-lying areas in the southern portion of the city.

Exposure within the mapped inundation area is moderate relative to other hazards but remains significant in terms of potential consequences. Approximately 13,000 residents, representing roughly 15 to 20 percent of the City's population, are located within potential inundation areas. Similarly, on the order of 6,000 parcels fall within the inundation zone, representing a comparable share of total development. The total value of exposed structures and contents is substantial, estimated in the range of several billion dollars, indicating the potential for considerable economic losses in the event of a failure scenario. Critical infrastructure exposure is present but variable, with certain categories, such as hazardous materials sites and transportation and lifeline systems, showing higher relative exposure compared to essential facilities.

Dam failure hazards are typically associated with structural failure, overtopping, seismic activity, internal erosion, extreme precipitation events, or operational malfunctions affecting reservoir systems. In the Napa Valley watershed, failure scenarios could generate rapid downstream flooding along the Napa River and its tributaries, resulting in high-velocity flow conditions, debris transport, and localized erosion. The relatively confined river corridor in some areas, combined with urban development along the floodplain, may increase flow depths and reduce available warning time.

Potential impacts within the City of Napa are primarily associated with sudden inundation and its cascading effects. Floodwaters could damage residential, commercial, and industrial structures, as well as critical infrastructure including roadways, bridges, and utilities. Inundation may also disrupt key transportation routes, particularly those crossing or running parallel to the Napa River, limiting access for emergency response and recovery operations. Additionally, floodwaters may transport sediment, debris, and contaminants, affecting water quality and potentially disrupting stormwater and wastewater systems.

Seismic activity represents an important consideration in dam failure risk. Earthquakes similar to those described in the scenario analysis may impose structural stress on upstream dams, potentially contributing to failure under extreme conditions. In addition, intense storm events and prolonged rainfall may increase reservoir levels and inflow volumes, raising the likelihood of overtopping or operational strain on dam infrastructure.

Although the spatial extent of dam inundation is smaller than that of riverine flooding, the hazard is characterized by rapid onset, limited warning time, and high consequence, which increases life safety risks for exposed populations. The concentration of development and infrastructure within portions of the inundation zone further underscores the importance of coordinated emergency planning and public awareness.

DAM INUNDATION EXPOSURE

CITY OF NAPA

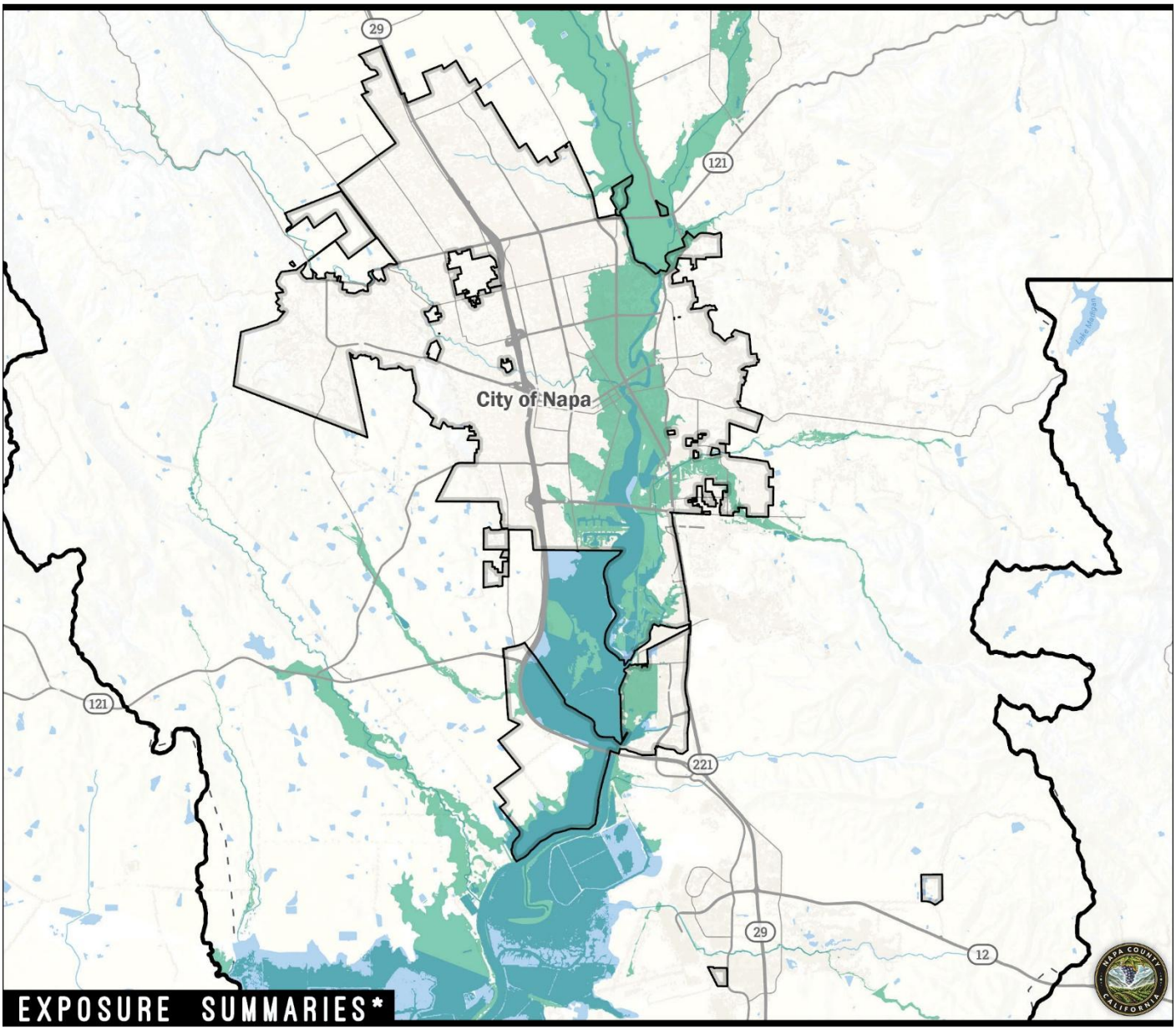


Figure 3-12: Exposure Summary – City of Napa Dam Inundation Zone

3.5.2.3 Flood Hazard

Flooding is a significant natural hazard for the City of Napa due to its location within the Napa River watershed, relatively flat valley topography, and proximity to tidally influenced downstream systems. Portions of the City are subject to riverine flooding, localized stormwater flooding, and backwater effects, particularly during major precipitation events when high flows in the Napa River coincide with limited drainage capacity and downstream tidal influences. Flood hazard areas within the city are primarily concentrated along the Napa River corridor and its tributaries, including Napa Creek and Browns Valley Creek, as well as in localized low-lying areas throughout the community.

The FEMA Flood Risk Exposure map (Figure 3-14), shows areas within the 100-year (1% annual chance) and 500-year (0.2% annual chance) floodplains, including mapped floodway areas and levee-protected areas. As illustrated in Figure 3-14, flood-prone areas extend north to south through the central portion of the City following the Napa River corridor, with additional tributary and drainage-related flood hazard areas extending into developed neighborhoods. These flood-prone areas reflect the combined influence of river overflow, stormwater runoff, and constrained urban drainage systems. Flood hazards may be exacerbated during extreme storm events when elevated river flows coincide with downstream tidal conditions.

Exposure analysis indicates that over 12,000 residents, representing a notable portion of the City's population, are located within mapped flood hazard areas. In addition, several thousand parcels, accounting for a meaningful share of the City's total development, are exposed to flooding. The estimated building and contents value within flood hazard areas exceeds $1 billion, reflecting a substantial concentration of economic assets within flood-prone areas of the community.

Critical infrastructure exposure is also significant. Essential facilities, hazardous materials sites, and high potential loss facilities are located within mapped flood hazard areas, indicating potential risks to public safety and environmental resources during flood events. In addition, transportation and lifeline infrastructure is widely intersected by flood-prone areas, highlighting the potential for roadway closures, access limitations, and disruption of essential services during flood events (Figure 3-14).

Flooding in the City of Napa can result in structural damage to buildings, roadway inundation, utility system impacts, and economic disruption. Flooding along the Napa River corridor has historically affected both residential and commercial areas, and localized flooding can impact neighborhoods with limited stormwater capacity. Secondary impacts include erosion, sediment deposition, and strain on flood control infrastructure, particularly during repetitive or prolonged storm events.

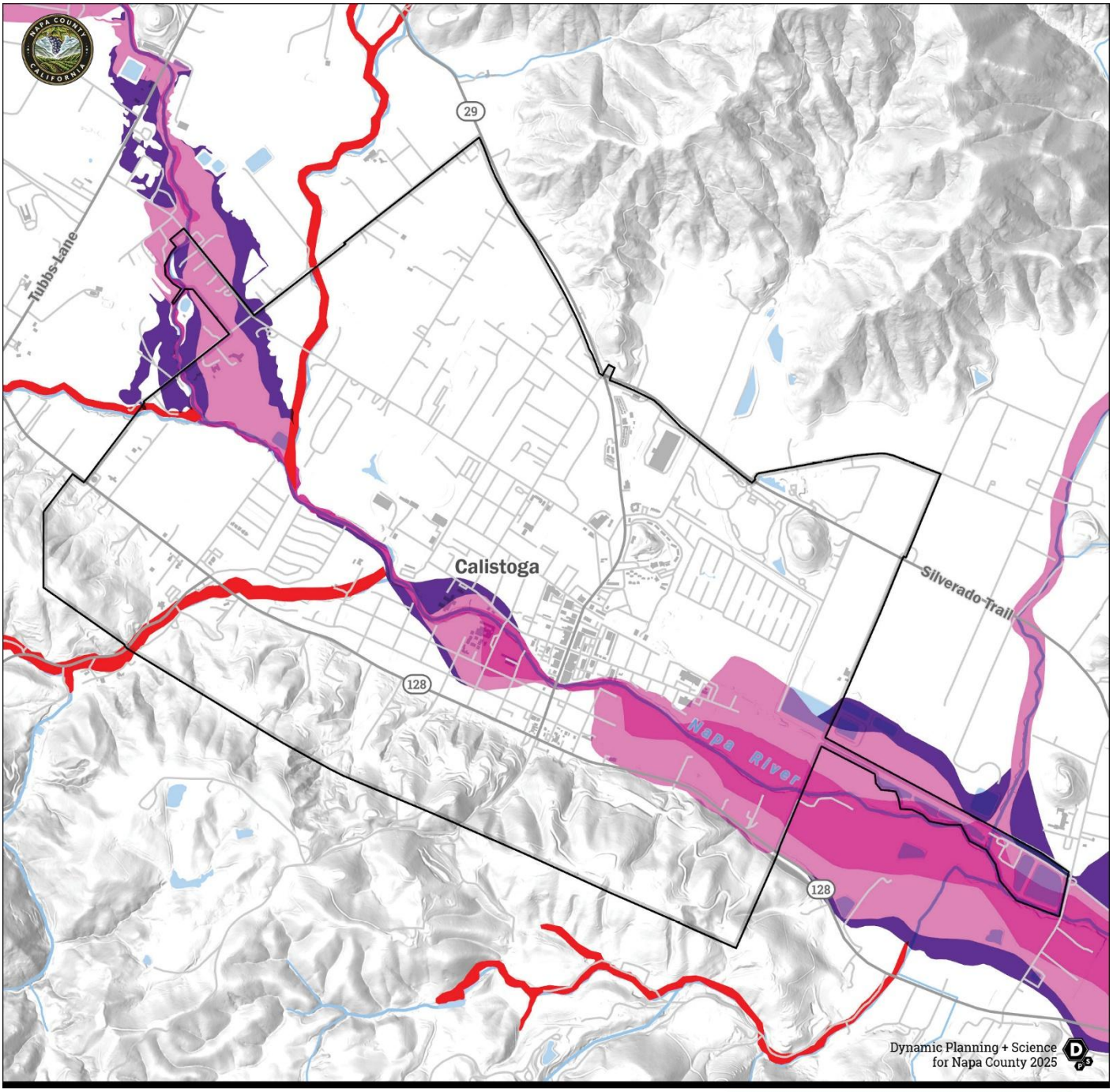


Figure 3-13: City of Napa Flood Risk (FEMA and DWR Awareness Zones)

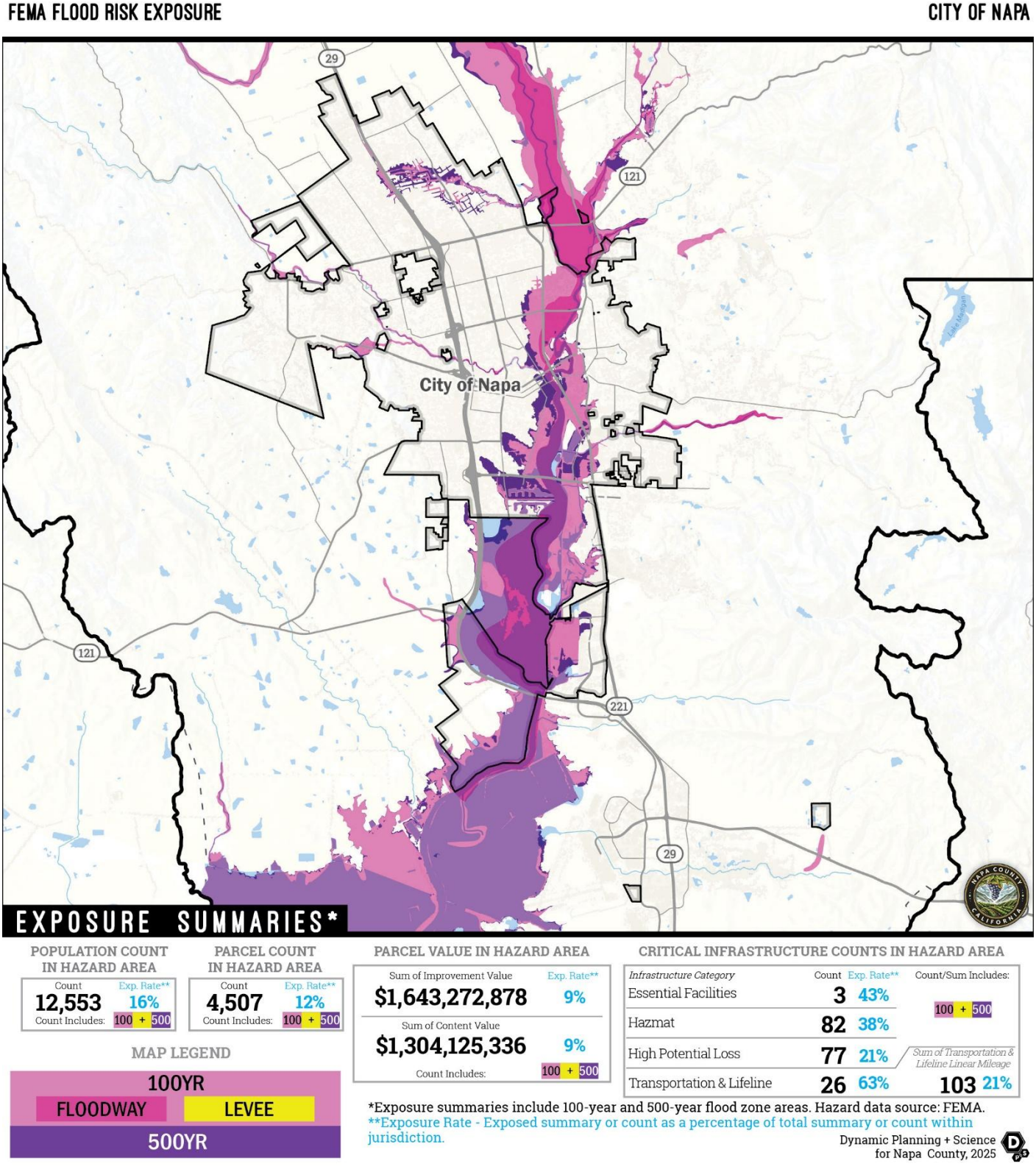


Figure 3-14: Exposure Summary – City of Napa Flood Risk (FEMA Zones)

National Flood Insurance Program

The National Flood Insurance Program (NFIP) makes federally backed flood insurance available to homeowners, renters, and business owners in participating communities. FEMA has prepared a detailed Flood Insurance Study (FIS) for Napa County and municipalities. The study presents water surface elevations for floods of various magnitudes, including the 1% annual chance flood (100-YR flood) and the 0.2% annual chance flood (500-YR flood). Base flood elevations and the boundaries of the 100- and 500-YR floodplains are shown on Flood Insurance Rate Maps (FIRMs), which are the principal tools for identifying the extent and location of the flood hazard. FIRMs are the most detailed and consistent data source available, and for many communities they represent the minimum area of oversight under their floodplain management program. See Section 4 of Volume 1 for general information on the NFIP.

The City of Napa has participated in the NFIP since 1979 and has adopted the most recent FIRMs and FIS issued by FEMA (dated August 3, 2016) as well as local floodplain development regulations in compliance with the minimum NFIP standards established in the City of Napa Municipal Code (§ 17.38.060 Floodplain Management Regulations). These minimum standards include procedures and provisions for substantial improvements and substantial damages to existing structures, the latter of which are employed by the floodplain administrator and city building inspectors following any hazard event affecting structures located in the flood hazard area in accordance with NFIP requirements. Regulations for substantial improvements are enforced via permitting procedures. Implementation and enforcement of the city's floodplain regulations are assigned to the Public Works Director, who serves as the floodplain administrator.

The City of Napa is currently in good standing with the provisions of the NFIP. Compliance is monitored by FEMA regional staff and by the California Department of Water Resources under a contract with FEMA. Maintaining compliance under the NFIP is an important component of flood risk reduction. See Figure 3-12 for more information on the City's policies and historic flood insurance claims.

Table 3-12: City of Napa National Flood Insurance Program Information

City of Napa NFIP and CRS Status and Flood Insurance Statistics	
NFIP Status	Participating since 9/05/79
Community Identification (CID)	060207
CRS Class (Entry Date)	Class 7 (4/01/2001)
Policies in Force (Total Coverage)	567 Policies / ($160,708,000 Coverage)
Policies Inside SFHA / Outside SFHA	420 Inside / 147 Outside
Total Claims (Total Paid)	890 Claims ($20,595,186 Paid)
Repetitive Loss (RL) / Severe Repetitive Loss (SRL) Properties	50 RL / 12 SRL
Repetitive Loss Payments (Building / Contents)	$4,822,687 / $1,699,117

Note: The number of policies is by property and does not count policies for individual buildings. The Privacy Act of 1974 (5 USC 522a) restricts the release of certain types of data to the public. Flood insurance policy and claims data is included in the list of restricted information. FEMA can only release such data to state and local governments, and only if the data is used for floodplain management, mitigation, or research purposes. Therefore, this plan does not identify the repetitive loss properties or include claims data for any individual property.

Principal Flooding Sources

Flood hazard conditions can exist along the entire length of the Napa River as it flows through the City as well as along the course of several tributary creeks. Flooding in the City has occurred when the Napa River's flow at Oak Knoll Avenue, which is just north of the City limits, has exceeded about 15,000 cubic feet per second. Some areas (typically agricultural land) will remain flooded for several weeks due to inadequate drainage, however, it is more typically true that such areas are only inundated for between one and three days. (City of Napa Hazard Mitigation Plan, 2015)

Napa Creek floodwaters have had a particularly significant impact on the center of the city. For instance, during the 1986 flood, Napa Creek overflowed on the south side of its banks. It flooded areas along Coombs Street and the parkway Plaza Mall as well as the downtown area. This was similar to a flooding event which occurred in 1942. The completion of the Napa Creek Flood Protection Project is a significant mitigation to the threat of flooding and has been predicted to significantly reduce or eliminate property damage from 100-year storm events, especially in the downtown Napa River Oxbow area. (*Id.*)

Localized flooding may sometimes occur outside of recognized drainage channels or delineated floodplains due to a combination of locally heavy precipitation, increased surface runoff, and inadequate facilities for drainage and stormwater conveyance. Such events most typically occur in flat areas and in urbanized areas with extensive impermeable surfaces. Local drainage may result in "nuisance flooding," in which streets or parking lots are temporarily closed and minor property damage occurs.

3.5.2.3.1 Napa River-Napa Creek Flood Protection Project

After a long history of destructive flooding in Napa, the city undertook a comprehensive project to reduce flooding, known as the Napa River-Napa Creek Flood Protection Project. Parts of the project have been completed while other parts are ongoing. The location of flooding in the city has already been significantly reduced thanks to completed phases of the Project.

The first major hurdle the City faced was funding such a large-scale effort. Two-thirds of voters in Napa County passed Measure A in March of 1998. This half-cent local sales tax levy provides a funding mechanism for the local share of the project cost and helped solidify the partnership between the Napa County Flood Control and Water Conservation District (NCFCWCD) and the U.S. Army Corps of Engineers. Measure A funds flood protection, drainage improvements, dam safety, and watershed management projects for each community in Napa County and in the unincorporated area of the county. (FEMA, 2021)

In 2000, the Napa County Flood Control and Water Conservation District in conjunction with the Army Corps of Engineers embarked on what would be a 16-year project to improve flood measures along the Napa River. Phase one of the Napa Creek Bypass Project was completed in 2012 and resulted in a large number of properties being mapped out of the floodway and floodplain.

The second phase of the Flood Project "Napa River Dry Bypass" was completed in the fall of 2016 and was successfully put to the test several times during the 2016-2017 rainy season when the County received

record amounts of rainfall. The City and Flood District have worked diligently with FEMA to produce a revised flood map that reflects the latest flood control improvements. The revised flood maps have been approved under the Napa Post-Bypass Letter of Map Revision (LOMR 16-09-1316P) with an effective date of January 22, 2019.

The Oxbow Bypass is a key part of the project. The bypass is a wet/dry channel that allows for the inundation of high flows from the Napa River during winter months to reduce high flows that would often back up and flood downtown Napa. The bypass includes flood gates to further protect downtown Napa from flooding. The bypass also serves as a community park, Oxbow Commons, which opened in 2015. The bypass is just one of many successes of the Project throughout the city that have reduced flood impacts.

3.5.2.3.2 Repetitive Loss Area Analysis

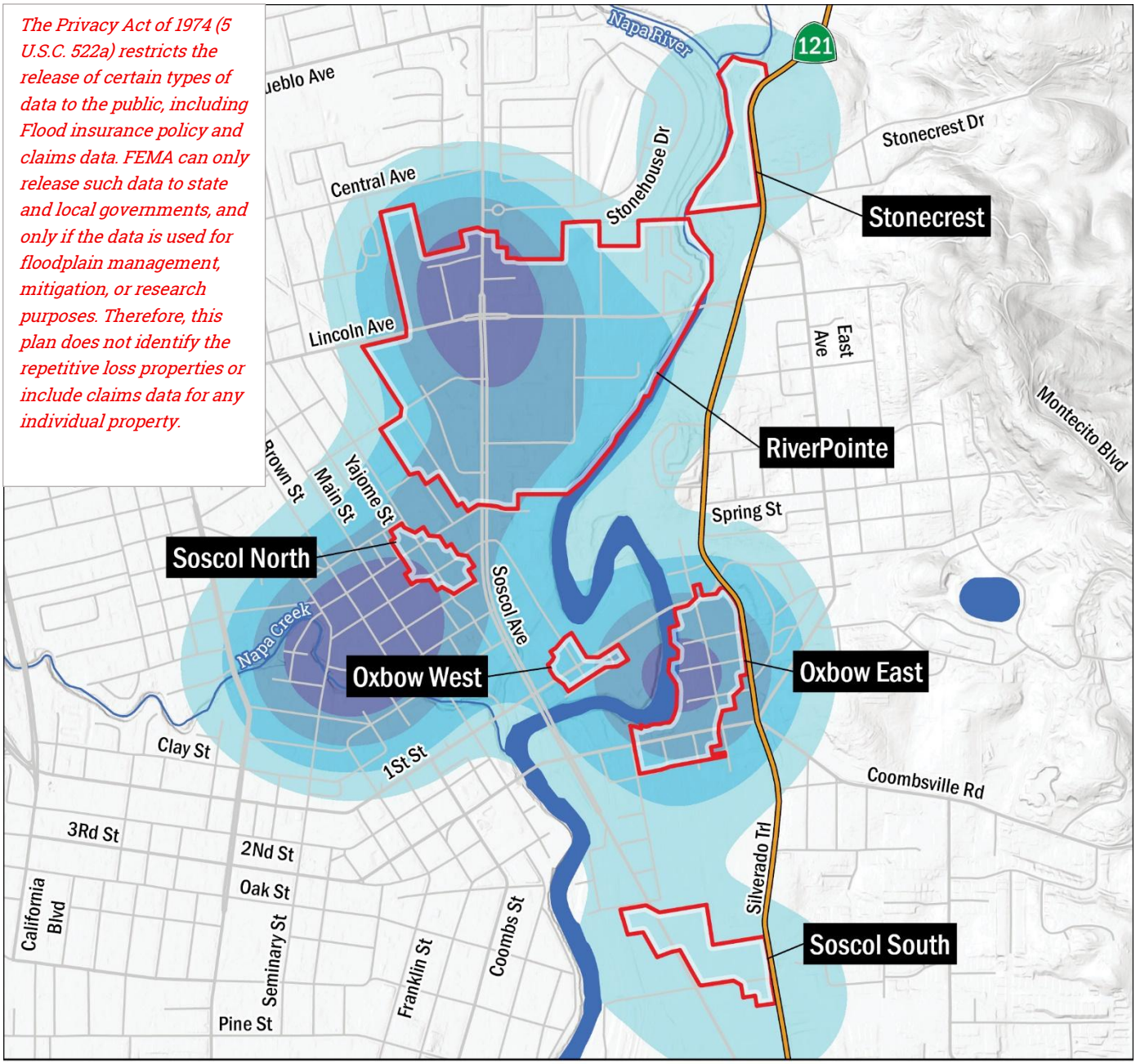
A repetitive loss (RL) property is a FEMA designation, defined as an insured property (or formerly insured) that has made two or more claims of more than $1,000 in any rolling 10-year period since 1978. Claims must be at least 10 days apart but within 10 years of each other. The term "rolling 10-year period" means that a claim of $1,000 can be made in 1991 and another claim for $2,500 in 2000, or one claim in 2001 and another in 2007, as long as both qualifying claims happen within 10 years of each other. A RL property may be classified as a Severe Repetitive Loss (SRL) property under certain conditions: the property has had four or more claims of at least $5,000, or at least two claims that cumulatively exceed the buildings reported value.

Extensive FEMA NFIP databases are used to track claims for every participating community, including the City of Napa. Currently, the city contains 55 unmitigated RL properties city-wide. The total dollar amount of claims paid to date by the NFIP for these RL properties are made available in Figure 3-15.

A property does not have to be currently carrying a flood insurance policy to be considered a RL or SRL property. Often homes in communities do not carry flood insurance but are still on the community's repetitive loss list. The "repetitive loss" designation follows a property from owner to owner, from insurance policy to no insurance policy, and even after the property has been mitigated. Having an insurance policy and making claims that fall into the repetitive loss criteria will put a property on the RL list. Even after the policy on a property has lapsed or been terminated, the property will remain on the City's RL list.

This Repetitive Loss Areas Analysis (RLAA) examines areas where multiple RL properties exist in close proximity to each other and share similar flooding source conditions. Six RL areas have been identified as part of the city's RLAA. Most RLAA areas are a result of flood damage caused by the Napa River. Local tributaries such as Napa Creek and Kreuse Creek also contribute to flood losses during high water events in RLAA areas. Figure 3-15 shows the repetitive loss areas in the City of Napa along with the information on claim data, historic loss information and current property value information in total. Figure 3-16 through Figure 3-21 show individualized claim and property data for each repetitive loss area.

The Privacy Act of 1974 (5 U.S.C. 522a) restricts the release of certain types of data to the public, including Flood insurance policy and claims data. FEMA can only release such data to state and local governments, and only if the data is used for floodplain management, mitigation, or research purposes. Therefore, this plan does not identify the repetitive loss properties or include claims data for any individual property.



FEMA REPETITIVE LOSS SUMMARY - NAPA CITY

REPETITIVE LOSS PROPERTIES

PROPERTY COUNT	55	BUILDING PAYOUTS	$4,822,687	AVERAGE PAYOUT	$34,634
LOSSES	152	CONTENT PAYOUTS	$1,699,117	TOTAL PAID	$6,521,804

ALL PARCELS IN REPETITIVE LOSS AREA

PROPERTY COUNT	432	SUM OF COST	$192,517,817	AVG COST	$397,012

REPETITIVE LOSS AREA

HISTORIC FLOOD LOSSES

LESS MORE

Figure 3-15: City of Napa Repetitive Loss Areas

Stonecrest RL Area

The Stonecrest RL Area is located near Stonecrest Avenue and Highway 121. This repetitive loss area consists of two properties on along the banks of the Napa River. Figure 3-16 indicates the area of generalized repetitive loss claims, payout information, and the FEMA identified flood hazard at Stonecrest. Most properties on the Napa River have significant risk to flooding, as indicated by past flood occurrences and past claims. One property is a SLR property with more than seven different claims dating back to 1985. Most properties or homes are not within the FEMA 100-YR Floodplain; however, there is a low-lying section of land along the banks of the Napa River that may contribute to flood damage in this area. The SFHA "Effective" FIRM indicates Base Flood Elevations (BFEs) of approximately 27.2 to 26.6 feet for the Napa River Floodway and the low-lying area is approximately 22 to 25 feet.

RiverPointe RL Area

RiverPointe RL Area is located along the west bank of the Napa River at Lincoln Avenue. This area is named after the RiverPointe Napa Valley Resort. It's known by local flood control and emergency management personnel that the Napa River jumps the west bank at this location due to the capacity of the Lincoln Avenue Bridge. Flood waters travel from the Napa River west down Lincoln Avenue and inundate areas north of Lincoln Avenue first; waters then flow across Lincoln Avenue at low-lying areas to the south. This repetitive loss area consists of 28 properties, located both north and south of Lincoln Avenue. Figure 3-17 indicates the area of generalized repetitive loss claims and payout information for RiverPointe. Most properties within this area have significant risk to flooding, as indicated by past flood occurrences and past claims, especially at the intersection of Lincoln Avenue and Soscol Avenue. Six properties in the RiverPointe Area are SLR properties. All RL properties within the RiverPointe Area are within the FEMA 100-YR Floodplain, and almost half are within the floodway of the Napa River. It is important to note that over four million dollars of claims have been paid by the NFIP in this area. Average payouts are more than $50,000 for each occurrence due to the commercial nature of many properties.

Soscol North RL Area

Soscol North RL Area is just south of the RiverPointe RL Area on Soscol Avenue. This RL area consists of five properties between Yount Street and Caymus Street along Yajome Street. Most properties within this area have significant risk of flooding, as indicated by past flood occurrences, past claims, and the proximity to the floodway. Figure 3-18 indicates the area of generalized repetitive loss claims, payout information, and the FEMA-identified flood hazard. All properties within this RL Area are within the FEMA 100-YR Floodplain. The SFHA "Effective" FIRM indicates BFEs of approximately 21 feet within this area, with most of the damage caused by the split flow of the Napa River during high water events and the low-lying nature of this area in the floodway.

Oxbow West RL Area

The Oxbow West RL Area is located on the west bank for the Napa River oxbow. This RL area consists of three RL properties within the oxbow, to the east of the "dry river bypass." Most properties within the oxbow have significant risk to flooding, as indicated by past flood occurrences and past claims. Figure 3-19 indicates the area of generalized repetitive loss claims, payout information, and the FEMA-identified flood hazard for this area. Flood risk has been reduced in recent years with the construction of the Napa River dry bypass and construction of flood gates to protect the oxbow from high water events; however, these RL properties are unmitigated according to FEMA. The SFHA "Effective" FIRM indicates BFEs of approximately 19.5 feet for the dry bypass floodway and approximately 19.7 feet for areas in the 100-YR floodplain near Vernon Street. Average payouts are more than $40,000 for each occurrence due to the commercial nature of the properties.

Oxbox East RL Area

The Oxbow East RL Area is located on the east bank for the Napa River oxbow. This RL area consists of 13 RL properties on the east bank of the Napa River. Most properties on within the oxbow have significant risk to flooding, as indicated by past flood occurrences and past claims. Figure 3-20 indicates the area of generalized repetitive loss claims, payout information and the FEMA-identified flood hazard for this area. Flood risk has been reduced in recent years with the construction of the Napa River dry bypass to alleviate this neighborhood from high water events; however, these RL properties are unmitigated according to FEMA. All properties in this RL Area are within the FEMA 100-YR Floodplain and the Napa River oxbow overflow area. The SFHA "Effective" FIRM indicates BFEs of 19.7 feet for areas near 2nd and Post Streets down to 18.3 feet for areas near 3rd Street. It is important to note that over one million dollars of claims have been paid by the NFIP in this area.

Soscol South RL Area

The Soscol RL Area is located on Soscol Ave between 8th Street and Sousa Lane. This RL area consists of 3 RL properties within the southern area of the Napa River oxbow overflow. Most properties in this overflow area have significant risk of flooding, as indicated by past flood occurrences and past claims. Figure 3-17 indicates the area of generalized repetitive loss claims, payout information, and the FEMA-identified flood hazard for this area. Flood risk has been reduced in recent years with the construction of the Napa River dry bypass to alleviate this neighborhood from high water events; however, these RL properties are unmitigated according to FEMA. All properties in this RL Area are within the FEMA 100-YR Floodplain. The SFHA "Effective" FIRM indicates BFEs of 16.2 feet for areas near 8th Street and dropping to approximately 15.7 feet for areas near Sousa Lane. It is important to note that Kreuse Creek may contribute to flood risk in this area. It's been reported that Kreuse Creek backs up at Soscol Avenue and runs north down Soscol Avenue which may contribute to losses within this area. Average payouts are more than $45,000 for each occurrence due to the commercial nature of the properties.



FEMA REPETITIVE LOSS SUMMARY - STONECREST

REPETITIVE LOSS PROPERTIES

PROPERTY COUNT	3	BUILDING PAYOUTS	$224,059	AVERAGE PAYOUT	$23,403
LOSSES	10	CONTENT PAYOUTS	$45,782	TOTAL PAID	$269,841

ALL PARCELS IN REPETITIVE LOSS AREA

PROPERTY COUNT	30	SUM OF COST	$11,079,292	AVG COST	$369,310

REPETITIVE LOSS AREA

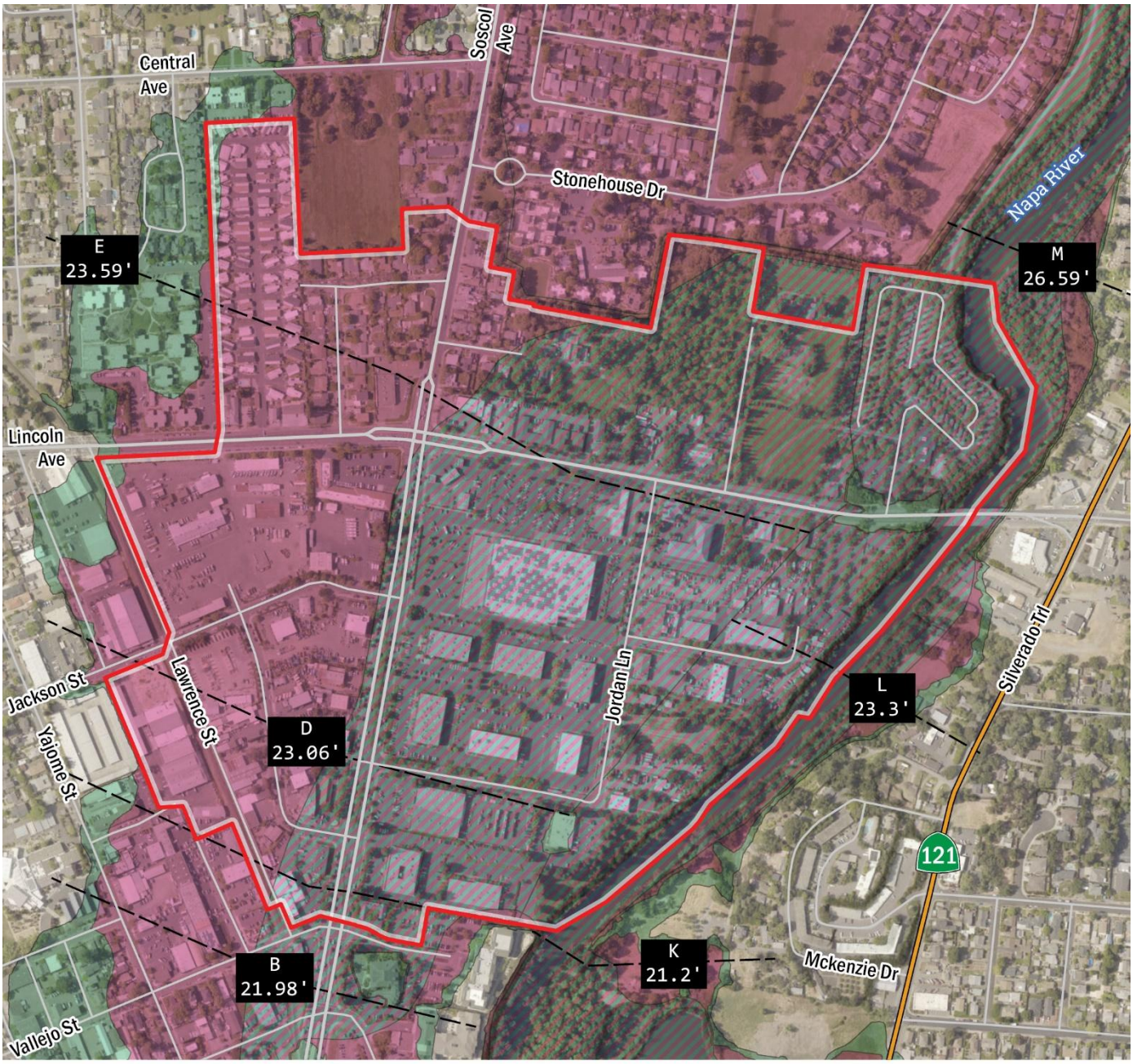
FEMA FLOOD ZONES

100-YR: SFHA, FLOODWAY; 500-YR

FLOOD ZONE CROSS SECTION

A 19.5' ← DFIRM ID ← Water Surface Elev.

Figure 3-16: Stonecrest RL Area



FEMA REPETITIVE LOSS SUMMARY - RIVERPOINTE

REPETITIVE LOSS PROPERTIES

PROPERTY COUNT	28	BUILDING PAYOUTS	$3,378,951	AVERAGE PAYOUT	$52,414
LOSSES	76	CONTENT PAYOUTS	$911,730	TOTAL PAID	$4,290,681

ALL PARCELS IN REPETITIVE LOSS AREA

PROPERTY COUNT	209	SUM OF COST	$130,038,992	AVG COST	$622,196

REPETITIVE LOSS AREA

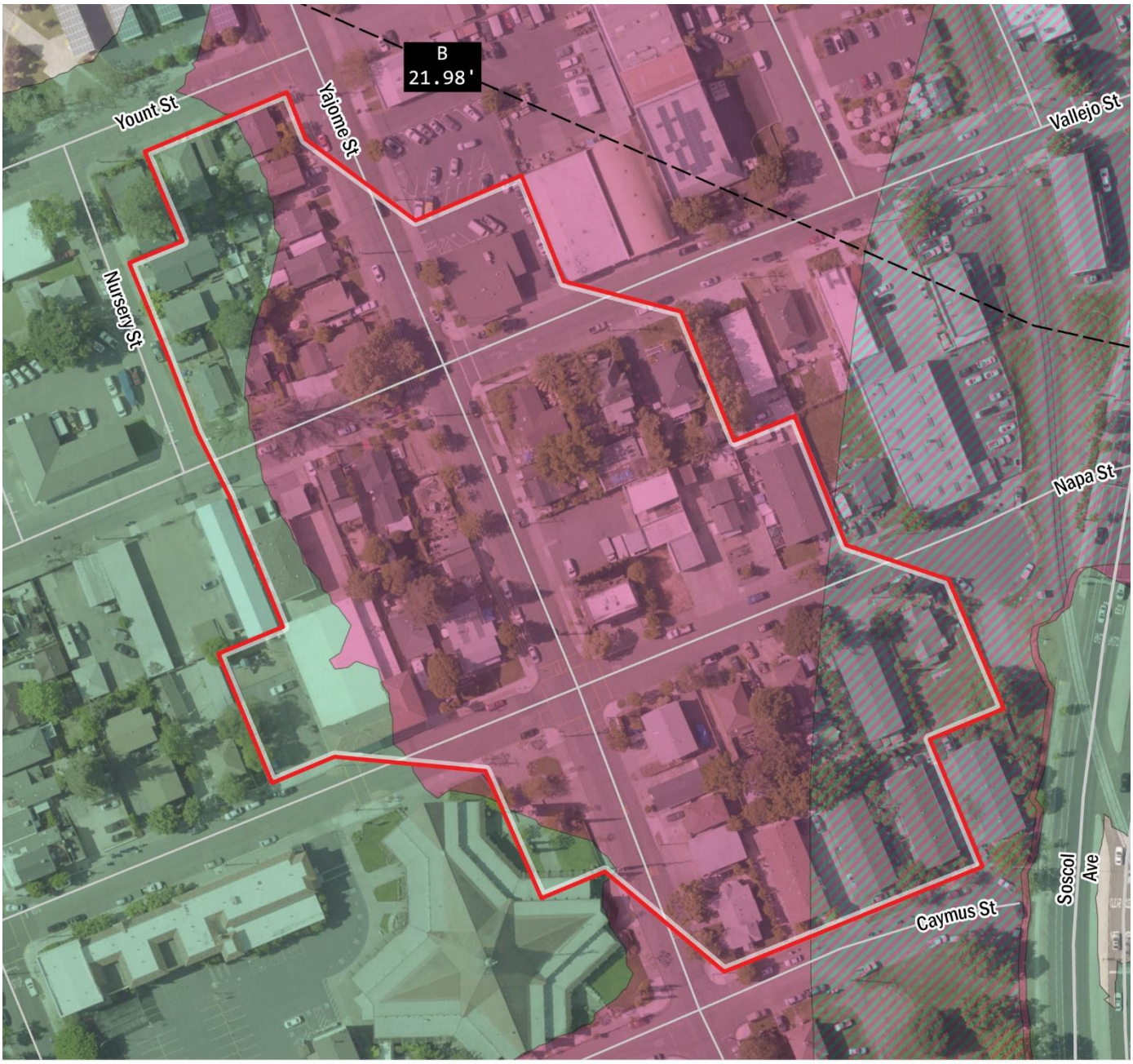
FEMA FLOOD ZONES

100-YR: SFHA | FLOODWAY | 500-YR

FLOOD ZONE CROSS SECTION

A 19.5' ← DFIRM ID ← Water Surface Elev.

Figure 3-17: RiverPointe RL Area



FEMA REPETITIVE LOSS SUMMARY - SOSCOL NORTH

REPETITIVE LOSS PROPERTIES

PROPERTY COUNT	5	BUILDING PAYOUTS	$205,358	AVERAGE PAYOUT	$18,099
LOSSES	12	CONTENT PAYOUTS	$10,424	TOTAL PAID	$215,782

ALL PARCELS IN REPETITIVE LOSS AREA

PROPERTY COUNT	51	SUM OF COST	$10,866,842	AVG COST	$213,075

REPETITIVE LOSS AREA

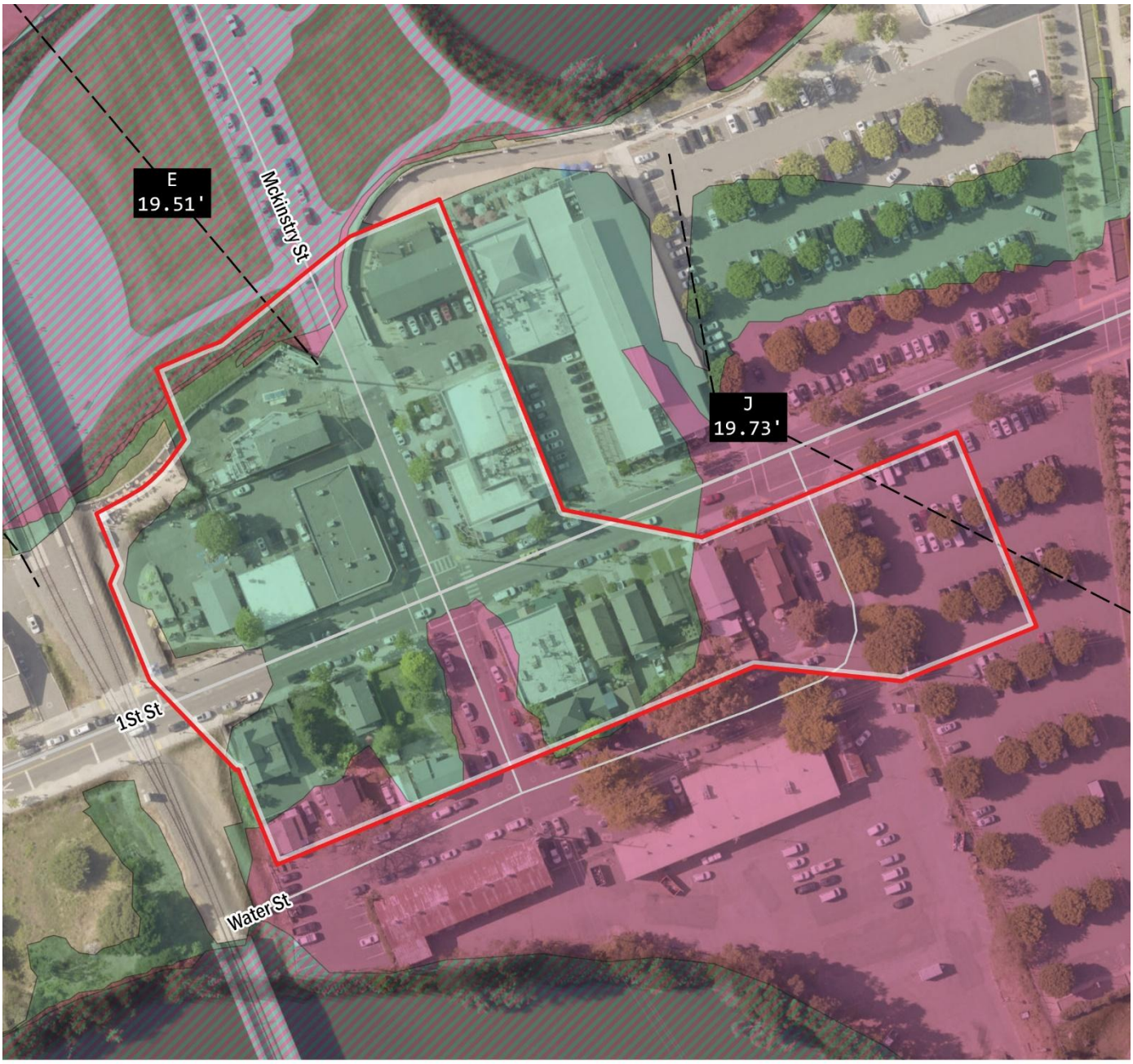
FEMA FLOOD ZONES

100-YR: SFHA, FLOODWAY; 500-YR

FLOOD ZONE CROSS SECTION

A 19.5' ← DFIRM ID ← Water Surface Elev.

Figure 3-18: Soscol North RL Area



FEMA REPETITIVE LOSS SUMMARY - OXBOW WEST

REPETITIVE LOSS PROPERTIES

PROPERTY COUNT	3	BUILDING PAYOUTS	$227,197	AVERAGE PAYOUT	$41,543
LOSSES	9	CONTENT PAYOUTS	$120,242	TOTAL PAID	$347,439

ALL PARCELS IN REPETITIVE LOSS AREA

PROPERTY COUNT	32	SUM OF COST	$11,736,182	AVG COST	$366,756

REPETITIVE LOSS AREA

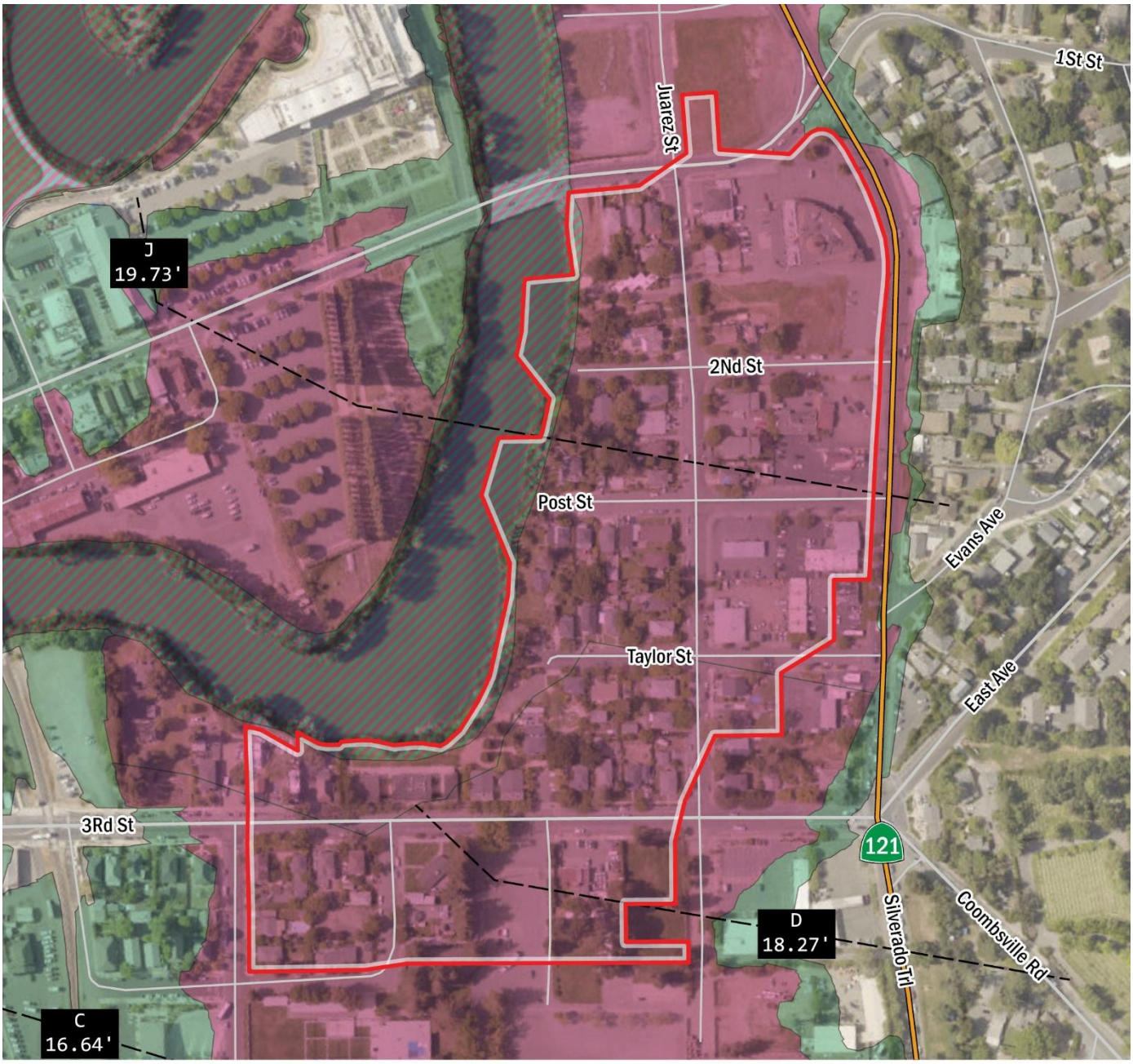
FEMA FLOOD ZONES

100-YR: SFHA, FLOODWAY; 500-YR

FLOOD ZONE CROSS SECTION

A 19.5' ← DFIRM ID ← Water Surface Elev.

Figure 3-19: Oxbow West RL Area



FEMA REPETITIVE LOSS SUMMARY - OXBOW EAST

REPETITIVE LOSS PROPERTIES

PROPERTY COUNT	13	BUILDING PAYOUTS	$537,556	AVERAGE PAYOUT	$26,515
LOSSES	38	CONTENT PAYOUTS	$515,639	TOTAL PAID	$1,053,195

ALL PARCELS IN REPETITIVE LOSS AREA

PROPERTY COUNT	93	SUM OF COST	$18,372,427	AVG COST	$197,553

REPETITIVE LOSS AREA

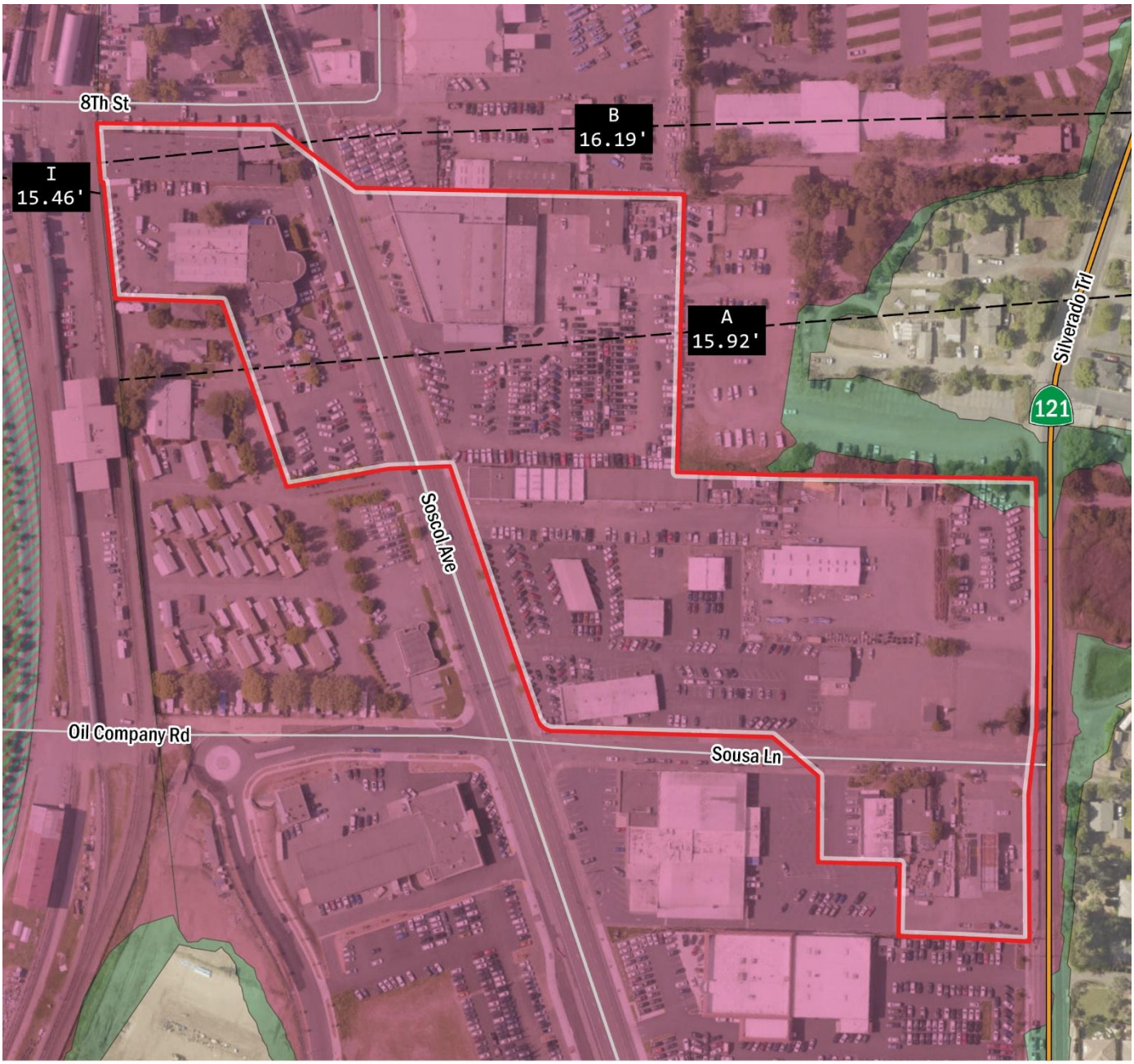
FEMA FLOOD ZONES

100-YR: SFHA | FLOODWAY | 500-YR

FLOOD ZONE CROSS SECTION

A 19.5' ← DFIRM ID ← Water Surface Elev.

Figure 3-20: Oxbow East RL Area



FEMA REPETITIVE LOSS SUMMARY - SOSCOL SOUTH

REPETITIVE LOSS PROPERTIES

PROPERTY COUNT	3	BUILDING PAYOUTS	$249,566	AVERAGE PAYOUT	$45,830
LOSSES	7	CONTENT PAYOUTS	$95,300	TOTAL PAID	$344,866

ALL PARCELS IN REPETITIVE LOSS AREA

PROPERTY COUNT	17	SUM OF COST	$10,424,082	AVG COST	$613,181

REPETITIVE LOSS AREA

FEMA FLOOD ZONES

100-YR: SFHA, FLOODWAY; 500-YR

FLOOD ZONE CROSS SECTION

A 19.5' ← DFIRM ID ← Water Surface Elev.

Figure 3-21: Soscol South RL Area

3.5.2.3.3 Frequency & Probability of Future Occurrences

The City of Napa will most likely experience flooding in the future, with the probability of flooding in the City of Napa between 10 and 100% annually. Winter storms saturate soils in Napa County during the months of November through April. Napa County experiences "atmospheric river storms" that can deliver over an inch of rain per hour for extended time frames, producing flooding in local tributary streams and the Napa River. The 100-year flood is calculated to be the level of flood water expected to be equaled or exceeded every 100 years on. The term is used to describe an event that has a 1-in-100 chance of happening in any given year. In reality, there is a 65% chance that there will be a 100-year flood in 100 years. Likewise, a 50-year flood has a 2% chance of happening in any given year, and there's a 4% chance of a 25-year flood every year. Calculations are based on less than a hundred years of flood records. The Napa River Flood Project has been constructed to protect the community from this 100-year event, which would be a larger flood than the 1986, 1995, or 2005 flood events.

Less Frequent Flooding Areas

In addition to mapped flood hazard areas, the City of Napa is subject to less frequent, higher magnitude flood events that extend beyond the limits of the currently mapped floodplain. These events include the 0.2% annual chance flood (500-year event) and other extreme storm scenarios that may exceed the capacity of existing flood control and drainage systems.

Analysis of Best Available Mapping (BAM) data from the California Department of Water Resources (DWR) indicates that additional areas—particularly along tributary systems and upstream watershed corridors—have the potential to experience inundation beyond the FEMA-mapped Special Flood Hazard Areas (SFHAs). These areas are shown in red on the accompanying map and represent locations where flooding may occur under larger storm events or changing watershed conditions. Less frequent flooding is most likely to occur in:

- **Upper Napa River corridor** north of downtown where floodwaters expand beyond the primary channel;
- **Downtown Napa and Oxbow District**, where backwater effects and system capacity constraints may occur;
- **Southern Napa near the Napa River estuary and airport**, where tidal influence and storm surge interactions increase flood extent;
- **Tributary corridors**, including Napa Creek, Tulucay Creek, Salvador Creek, and other smaller drainages where localized flooding may exceed mapped extents.

The DWR BAM analysis highlights tributary reaches and upland drainage pathways that are not fully captured in FEMA mapping but may convey significant flood flows during extreme events (Figure 3-13).

Flood severity in the City of Napa is primarily influenced by flow depth and velocity, both of which increase during less frequent flood events. High-velocity flows, particularly in confined channels or where floodwaters overtop banks, can result in:

- Structural damage from debris impact;
- Channel migration and erosion;
- Infrastructure failure (roads, bridges, culverts);
- Rapid inundation of developed areas.

The main factors affecting flood damage are water depth and velocity. Deeper and faster flood flows can cause more damage. Shallow flooding with high velocities can cause as much damage as deep flooding with slow velocity. Peak discharge data further illustrates the magnitude of these events. For example:

- **Napa River;** upstream of Imola Avenue is estimated to convey, ~44,390 cubic feet per second (cfs) during a 1% annual chance event; ~53,450 cfs during a 0.2% annual chance event.
- **Upstream of Bull Island**; flows may reach convey ~45,200 cfs (1% event) and up to ~69,000 cfs (0.2% event)
- **Tributaries such as Tulucay Creek**; may experience flows exceeding ~4,530 cfs (1% event) and ~5,500 cfs (0.2% event)

These increases in discharge significantly expand flood extents and intensify hydraulic conditions, particularly where floodwaters leave the main channel and spread across developed floodplains. This is especially true when a channel migrates over a broad floodplain, redirecting high velocity flows and transporting debris and sediment. Flood severity is often evaluated by examining peak discharges; Table 3-13 lists peak flows used by FEMA to map City of Napa floodplains.

Table 3-13: Summary of Relevant Discharges in Napa County

	Drainage sq. Miles	Peak Discharge (cubic feet/second)			
Flooding Source/Location		**10-percent**	**2-percent**	**1-percent**	**0.2-percent**
Blossom Creek					
At confluence with Napa River	3.4	1,000	N/A	1,700	2,000
Cyrus Creek					
At confluence with Napa River	2.9	900	N/A	1,500	1,900
Garnett Creek					
At confluence with Napa River	6.9	1,900	N/A	3,200	3,900
Napa Creek					
At mouth	14.9	*	*	4,300	*
At the City of Napa corporate limits	14.9	2,200	*	3,500	4,500
Napa River					
Upstream of Bull Island	324	25,500	38,900	45,200	69,000
Upstream of Imola Avenue	300	26,770	39,200	44,390	53,450
Upstream of confluence of Tulucay Creek	*	25,810	38,010	42,720	51,260
Upstream of confluence of Napa Creek	*	20,040	35,600	40,100	48,300
Upstream of Trancas Street	*	22,750	33,430	39,000	44,540
Near the City of Napa (Oak Knoll Avenue)	281	18,500	*	33,000	46,000
Upstream of Oak Knoll Avenue	218	18,400	28,100	32,700	50,300
Near the City of St. Helena (Zinfandel Lane)	81.4	13,000	*	21,000	25,000

	Drainage sq. Miles	Peak Discharge (cubic feet/second)			
Flooding Source/Location		**10-percent**	**2-percent**	**1-percent**	**0.2-percent**
At Dunweal lane	23	7,800	N/A	12,500	15,000
At State Highway 29	21.6	7,400	N/A	12,000	14,500
At upstream corporate limits	5.4	3,300	N/A	5,100	6,400
Salvador Creek					
At confluence with Napa River	*	*	*	3,910	*
At Big Branch Road	1.8	*	*	3,213	*
Sulphur Creek					
At confluence with Napa River to Sulphur Creek Tributary	9.2	*	*	3,330[1]	*
Upstream of Sulphur Creek Tributary	7.6	*	*	3,110	*
Sulphur Creek Tributary					
At confluence with Sulphur Creek	1.1	*	*	500	*
Tulucay Creek					
At Soscol Avenue	*	2,880	*	4,530	5,500
Upstream of Camille Creek	*	2,050	*	3,250	4,050

Source: Table 5 Summary of Discharges from FEMA FIS Text, 2011
** Data not available*

3.5.2.3.1 Warning Time

The type and rate of flooding experienced in the City of Napa varies. In general, warning times for floods can be between 24 and 48 hours. Seasonal notification for flooding can enhance awareness for citizens at risk, and, when communicated effectively, advance notification can reach target audiences on a large scale.

3.5.2.4 Earthquake Hazard

The City of Napa faces significant earthquake risk due to its location within the seismically active San Francisco Bay Area and its proximity to multiple active fault systems, including the West Napa Fault Zone. Scenario-based analyses for this planning effort provides insight into the range of potential impacts from both regional and local seismic events, as illustrated in Figure 3-22 and Figure 3-23.

The Hunting Creek–Berryessa earthquake scenario (M7.1), shown in Figure 3-22 represents a large regional event affecting a broad portion of Napa County. Under this scenario, ground shaking across the City of Napa is generally characterized as moderate to strong, with some areas experiencing very strong shaking. Because the source of the earthquake is more distant, the intensity of shaking is somewhat reduced compared to a local event, although it still affects a large portion of the community. Approximately three-quarters of the City's population and development are exposed to strong shaking, representing on the order

[1] Flow rate reduction due to capacity restriction

of nearly 60,000 residents and tens of thousands of parcels. A substantial portion of the City's building and contents value, on the order of tens of billions of dollars, is also exposed. Critical infrastructure is widely affected, though not uniformly, indicating that while impacts would be extensive, they may vary across different parts of the city.

In contrast, the West Napa earthquake scenario (M6.7), shown in Figure 3-23, represents a more localized event occurring in close proximity to the City. Despite its lower magnitude, this scenario produces stronger and more uniform shaking across Napa. Nearly the entire City is subject to strong to very strong ground shaking, resulting in complete exposure of the population, built environment, and infrastructure systems. This corresponds to nearly 80,000 residents, over 35,000 parcels, and the full extent of the City's structural and contents value being subjected to damaging levels of shaking. All categories of critical infrastructure are similarly affected, reflecting the widespread and concentrated nature of impacts from a local seismic event.

Together, these scenarios demonstrate that earthquake risk in Napa is strongly influenced by proximity to the fault source. A larger regional earthquake produces widespread but somewhat variable impacts, while a smaller, nearby event results in more intense and uniform shaking across the entire city. In both cases, the expected impacts include damage to residential, commercial, and industrial buildings, disruption of transportation corridors such as State Route 29 and key arterial routes, and damage to essential utilities including water, wastewater, power, and communications systems.

Secondary hazards are also likely to contribute to overall earthquake risk. These include hazardous materials releases, fires following earthquakes, extended power outages, and reduced access for emergency response due to damage to roadways and bridges. Given the City's role as a regional economic and transportation center, these impacts have the potential to extend beyond Napa and affect surrounding communities.

Liquefaction

Liquefaction represents a significant secondary earthquake hazard for the City of Napa due to local soil conditions, groundwater characteristics, and proximity to the Napa River and associated floodplain deposits. Liquefaction occurs when saturated, loose, fine-grained soils lose strength during ground shaking, causing the ground to behave as a fluid. As shown in Figure 3-24, areas of higher liquefaction susceptibility are concentrated in:

- Napa River corridor and adjacent floodplain;
- Downtown Napa and the Oxbow District;
- Southern portions of the City near the estuary and wetlands;
- Low-lying areas underlain by young alluvial and estuarine deposits.

These areas are characterized by shallow groundwater and unconsolidated sediments, increasing the likelihood of ground failure during moderate to strong shaking. Liquefaction can significantly amplify earthquake impacts by disrupting lifeline infrastructure and limiting emergency response access. In areas

with both high shaking intensity and susceptible soils, the potential exists for widespread ground deformation and infrastructure damage.

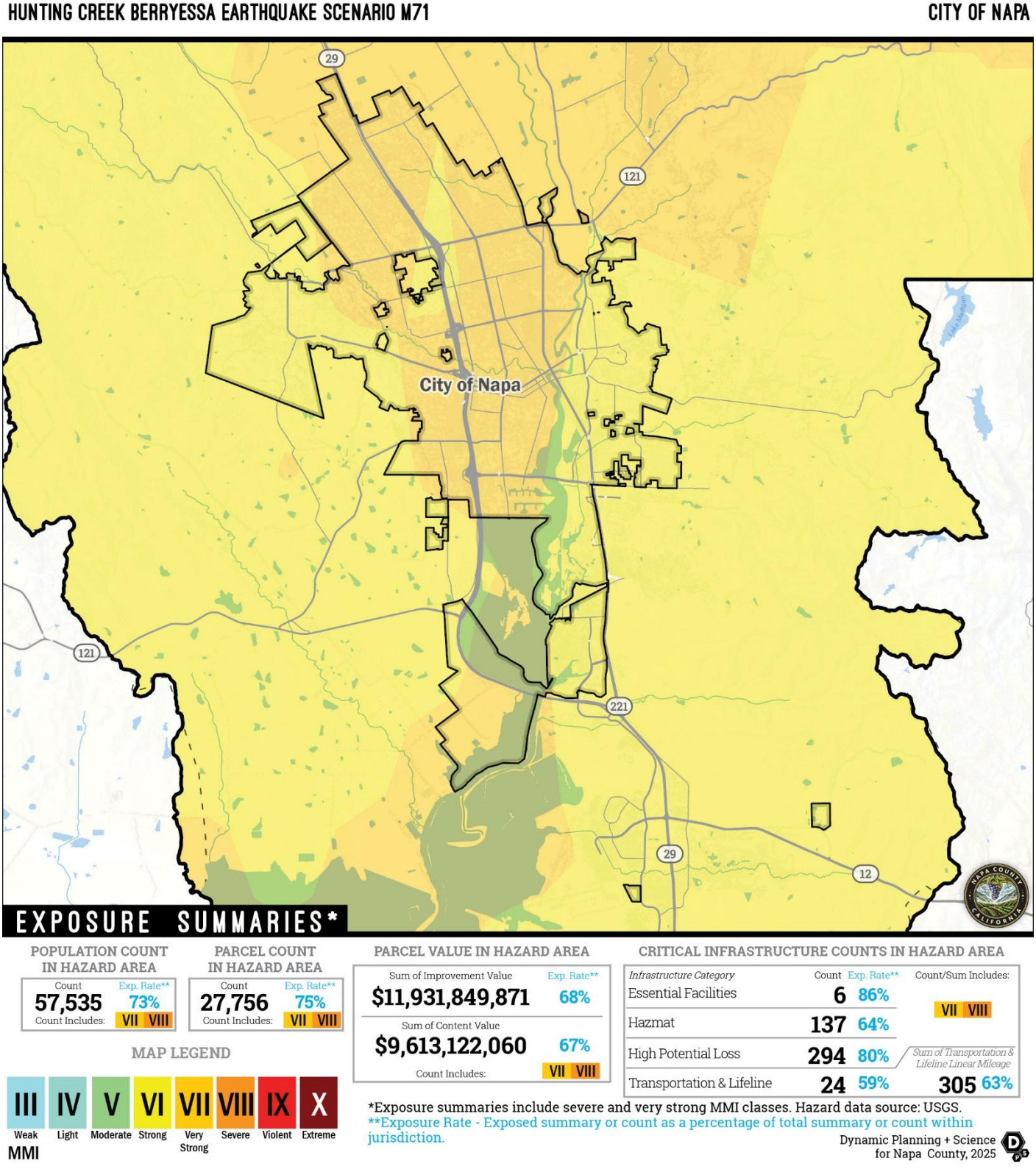


Figure 3-22: Exposure Summary – City of Napa Earthquake Risk (M7.1 Hunting Creek–Berryessa)

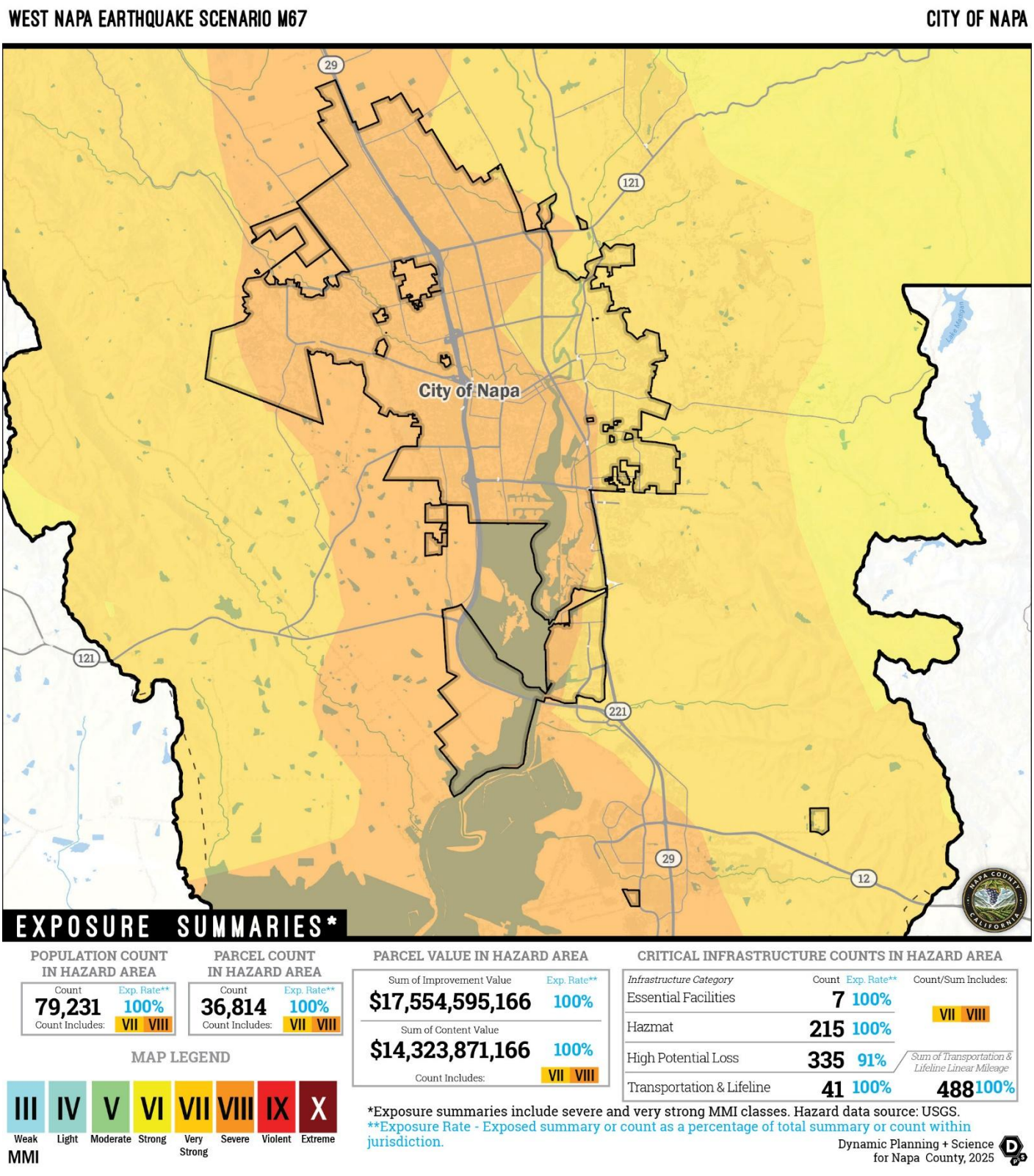


Figure 3-23: Exposure Summary – City of Napa Earthquake Risk (M6.7 West Napa)

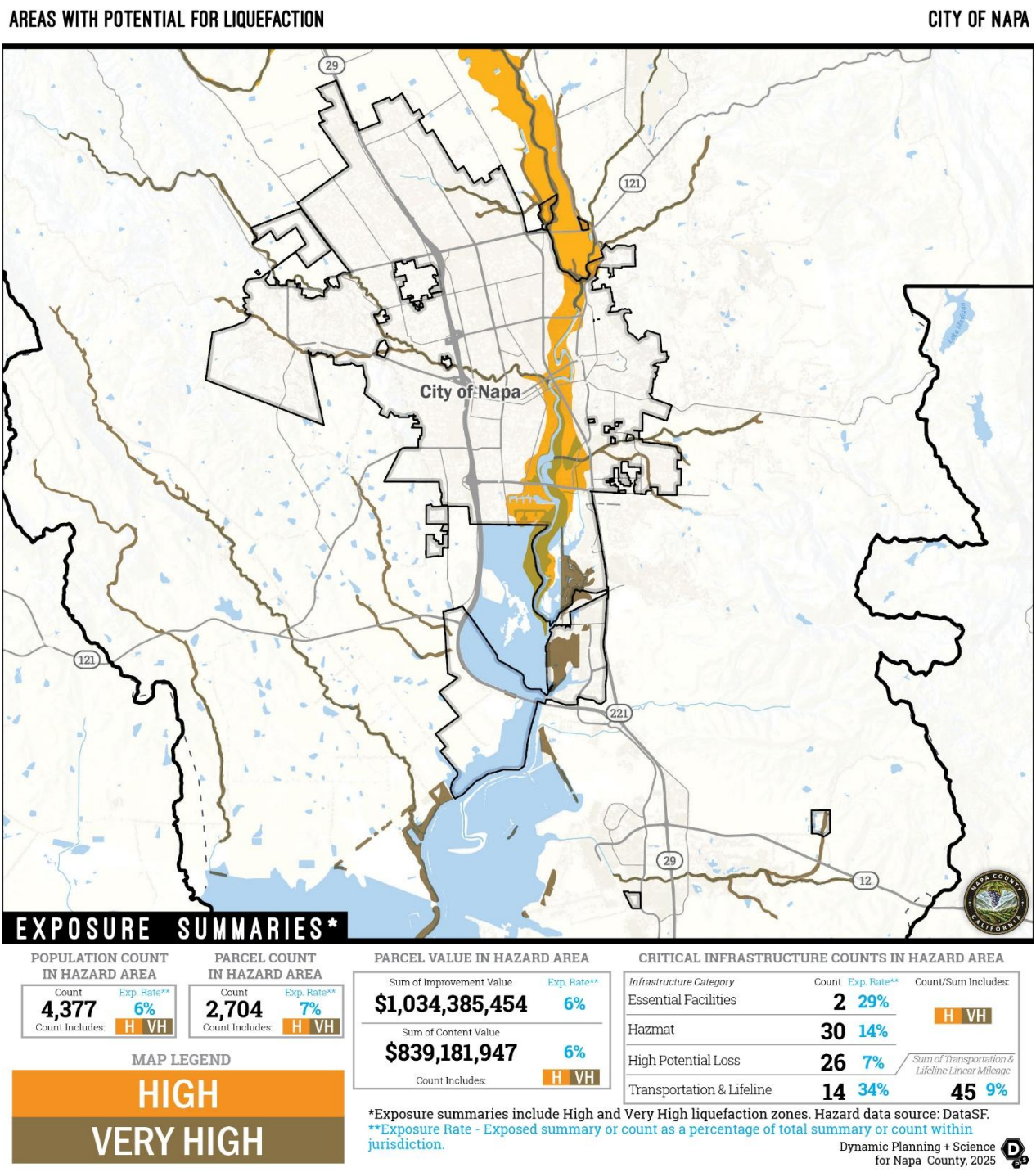


Figure 3-24: Exposure Summary – City of Napa Liquefaction Risk

3.5.2.5 Drought Hazard

The National Drought Monitor provides drought data and maps nationally and on a localized, watershed scale. The National Drought Monitor is the product of 11 agencies, including the NDMC, NOAA and USDA,

and is available at http://droughtmonitor.unl.edu/. The National Drought Monitor categorizes the level of drought from D0 through D4, with D4 being the highest "exceptional drought." Table 3-14 depicts drought classifications and impacts from the level of drought occurrence in California, while Figure 3-25 shows a time series of the level of drought in Napa County from 2000 to 2026 according to the National Drought Monitor.

Drought is a recurring and long-term hazard for the City of Napa due to California's Mediterranean climate, variable precipitation patterns, and increasing impacts from climate change. Periods of prolonged below-average rainfall, reduced snowpack in the Sierra Nevada, and higher temperatures can significantly affect regional water supplies, ecosystems, and community resilience. Although drought does not typically cause immediate physical damage like other hazards, its cumulative impacts can be widespread and long-lasting.

Napa relies on a combination of surface water and imported water supplies that are vulnerable to regional drought conditions. Extended drought periods can reduce available water supplies, increase demand during hotter and drier conditions, and place stress on water delivery systems. Drought conditions may also require implementation of mandatory water conservation measures, affecting residents, businesses, landscaping, and industrial operations.

Drought can exacerbate other natural hazards affecting the city. Dry conditions increase vegetation stress and fuel loads, elevating wildfire risk in surrounding grasslands and open space areas. Reduced soil moisture can also contribute to land subsidence, soil instability, and increased erosion during subsequent storm events. In addition, drought can degrade wetlands and riparian habitats along the Napa River and bayfront, reducing their natural flood attenuation and ecological functions.

Economic impacts of drought may include increased operational costs for businesses, reduced agricultural productivity in the surrounding region, and higher household expenses related to water use restrictions or rate adjustments. Vulnerable populations, including low-income households and elderly residents, may be disproportionately affected by higher utility costs and reduced access to cooling and water resources during extreme heat events associated with drought.

Climate change projections indicate that drought conditions in California are likely to become more frequent and severe, with longer dry periods punctuated by fewer but more intense storm events. These trends increase uncertainty in water supply reliability and place additional importance on long-term water resource planning, conservation, and resilience measures.

Table 3-14: Drought Classifications and Impacts

Category	Description	Possible Impacts
D0	**Abnormally Dry**	▪ Soil is dry; irrigation delivery begins early ▪ Dryland crop germination is stunted ▪ Active fire season begins

Category	Description	Possible Impacts
D1	Moderate Drought	▪ Dryland pasture growth is stunted; producers give supplemental feed to cattle ▪ Landscaping and gardens need irrigation earlier; wildlife patterns begin to change ▪ Stock ponds and creeks are lower than usual
D2	Severe Drought	▪ Producers increase water efficiency methods and drought-resistant crops ▪ Grazing land inadequate ▪ Fire season is longer, with high burn intensity, dry fuels, and large fire spatial extent, more fire crews on staff ▪ Lake- and river-based tourism declines; boat ramps close ▪ Trees are stressed; plants increase reproductive mechanisms; wildlife diseases increase ▪ Water temperatures increase; programs to divert water to protect fish begin ▪ River flows decrease; reservoir levels are low and banks are exposed
D3	Extreme Drought	▪ Federal water is not adequate to meet irrigation contracts; extracting supplemental groundwater is expensive ▪ Fire season lasts year-round; fires occur in typically wet parts of the state; burn bans are implemented ▪ Ski and rafting business are low; mountain communities suffer ▪ Low water levels impede fish migration and cause lower survival rates ▪ Wildlife encroaches on developed areas; little native food and water is available for bears, which hibernate less ▪ Water sanitation is a concern; reservoir levels drop significantly; surface water is nearly dry; flows are very low; water theft occurs ▪ Livestock need supplemental feed, cattle and horses are sold; little pasture remains ▪ Well and aquifer levels decrease; homeowners drill new wells
D4	Exceptional Drought	▪ Fire season is very costly; number of fires and areas burned are extensive ▪ Many recreational activities are affected ▪ Fields are left fallow; orchards are removed; vegetable yields are low; honey harvest is small; agricultural unemployment is high, food aid is needed ▪ Fish rescue and relocation begin; pine beetle infestation occurs; forest mortality is high; wetlands dry up; wildlife death is widespread; algae blooms appear ▪ Poor air quality affects health: greenhouse gas emissions increase as hydropower production decreases; West Nile outbreaks rise ▪ Water shortages are widespread; surface water is depleted; federal irrigation water deliveries are curtailed; water prices are extremely high; wells are dry, more and deeper wells are drilled; water quality is poor

Source: Adapted from U.S. Drought Monitor Drought Classifications and Impacts

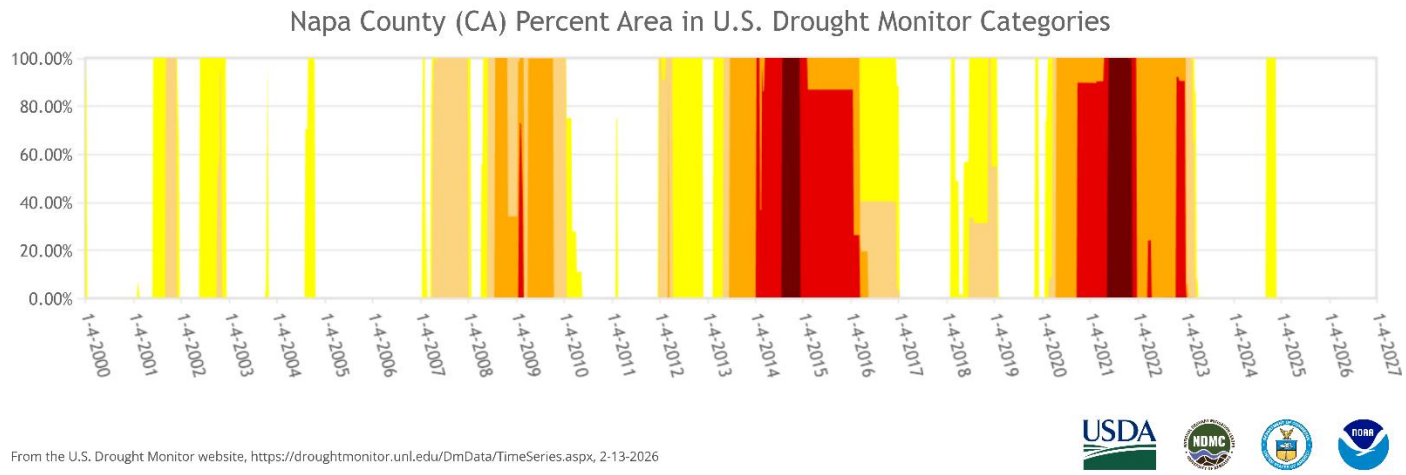


Figure 3-25: Drought Severity Timeline 2000-2026

3.5.2.6 Severe Weather Hazard

Although the City of Napa benefits from a Mediterranean climate with some moderating marine influence from San Pablo Bay, the community remains vulnerable to a range of severe weather hazards, including high wind events, heavy rainfall, and winter storm systems. While these hazards may occur less frequently or with lower intensity than hazards such as wildfire or earthquake, they can still result in significant impacts to infrastructure, essential services, and vulnerable populations.

High Wind

High wind events represent a recurring severe weather hazard within the City of Napa, particularly during winter storm systems and offshore wind conditions. Winds may be funneled through the Napa Valley and surrounding hills, producing localized gusts that can cause damage across both urban and rural areas. These events have the potential to down trees and power lines, resulting in power outages, blocked roadways, and damage to residential and commercial structures.

High winds also contribute to broader hazard conditions. During dry periods, strong winds can exacerbate wildfire risk by increasing fire spread potential and carrying embers across developed areas. Within the built environment, structures with aging roofs, mobile homes, and outdoor facilities such as parks and schools may be particularly vulnerable to wind damage. Public safety concerns include falling trees and debris in residential neighborhoods and along major transportation corridors such as State Route 29 and Silverado Trail, where wind-related hazards can lead to traffic disruptions and accidents. Power outages associated with high wind events may also disrupt businesses, schools, and critical facilities.

Heavy Rain

The City of Napa is also exposed to severe winter storm events that can produce heavy rainfall, localized flooding, and hazardous travel conditions. These storm systems are often associated with atmospheric river events that bring prolonged periods of precipitation, increasing the risk of riverine flooding along the Napa River and its tributaries, as well as urban drainage issues in developed areas.

Heavy rainfall can lead to saturated soils, increasing the likelihood of localized slope instability, erosion, and debris flows, particularly in hillside areas surrounding the valley floor. Storm events may also include lightning, short-duration intense rainfall, and occasional hail, all of which can contribute to property damage and public safety risks.

Severe weather impacts in Napa often cascade across multiple hazard areas. High winds and heavy rainfall are closely linked to power outages and infrastructure disruptions, which can disproportionately affect vulnerable populations, including older adults, medically dependent individuals, and residents without reliable access to backup power. Downed trees and localized flooding may block critical access routes, limiting mobility and emergency response capabilities.

As with other hazards, severe weather events may disproportionately affect lower-income households, renters, and populations with access and functional needs. These conditions underscore the importance of integrating severe weather considerations into emergency planning, infrastructure resilience, and equitable mitigation strategies.

3.5.2.7 Extreme Heat Hazard

The City of Napa's climate is influenced by its location within the Napa Valley and proximity to San Pablo Bay, which typically provides some moderation of temperature extremes. However, despite this marine influence, the City is increasingly experiencing periods of elevated temperatures, particularly during late summer and early fall when offshore flow conditions reduce coastal cooling effects. In recent decades, Napa has seen an increase in the frequency, duration, and intensity of extreme heat events, a trend that is expected to continue under changing climate conditions.

Historical & Regional Context

Although Napa has historically experienced a Mediterranean climate characterized by warm, dry summers and mild coastal influence, recent regional heat waves have demonstrated the City's growing vulnerability to extreme heat. Statewide events, including those in 2017 and 2020, resulted in prolonged periods of high temperatures across inland portions of the Bay Area, including Napa Valley. During these events, temperatures in Napa exceeded typical seasonal norms and, in some cases, approached or exceeded 100°F for multiple consecutive days.

Napa's valley setting contributes to heat retention, particularly during periods of high pressure and low wind, when warm air becomes trapped and nighttime cooling is limited. These conditions can result in

extended heat events that persist over several days, increasing cumulative stress on residents, infrastructure, and natural systems. Unlike areas immediately adjacent to the bay, portions of Napa experience more pronounced temperature extremes due to reduced marine influence and localized topographic effects.

Climate projections indicate that the city is likely to experience a substantial increase in both the number of extreme heat days and warm nights over time. Extreme heat days, defined as those exceeding historically high temperature thresholds, are expected to become more frequent, while warm nights will reduce opportunities for overnight cooling, compounding heat-related stress on vulnerable populations.

According to the Cal-Adapt extreme heat days and warm nights tool using a medium emissions scenario (RCP 4.5), the City of Napa will likely experience a climate change-driven increase in extreme heat days from four days per year to 15 days per year by the end of the century. Over the same time period, the city is also likely to see an increase in warm nights from four per year to 42. Table 3-15 explains the extreme heat event thresholds for the City of Napa.

Table 3-15: Cal-Adapt Extreme Heat Thresholds

Term	Cal-Adapt Definition	Thresholds for City of Napa
Extreme Heat Day	Defined as a day in a year when the daily maximum/minimum temperature exceeds the 98th percentile of daily maximum/minimum temperatures based on observed historical data from 1961-1990 between April and October.	**99.2°F**
Warm Night	Defined as a day in April through October when daily minimum temperature exceeds the 98th historical percentile of daily minimum temperatures, based on observed data from 1961-1990 between April and October.	**59.3°F**
Heat Wave	Defined as four consecutive days or nights above the extreme heat / warm night threshold.	**3 days ≥ 99.2°F** or **4 nights ≥ 59.3°F**

Source: Cal-Adapt Extreme Heat Days and Warm Nights Tool

Impacts on Residents & Infrastructure

Extreme heat presents a range of risks to public health, infrastructure, and community services within the City of Napa. The most immediate impacts are related to heat-related illness, including heat exhaustion and heat stroke, particularly among vulnerable populations such as older adults, young children, individuals with pre-existing health conditions, outdoor workers, and households without adequate cooling.

The City's demographic profile, including its aging population and residents with access and functional needs, increases sensitivity to prolonged heat events. In addition, disparities in housing quality and access to air conditioning can further exacerbate risk among lower-income households and renters.

From an infrastructure perspective, extreme heat increases demand on the electrical grid due to higher cooling needs, raising the likelihood of service disruptions or rolling outages. Elevated temperatures can also degrade infrastructure, including roadways, rail systems, and utility components, while placing additional strain on heating, ventilation, and air conditioning systems in homes, businesses, and critical facilities. Public services and outdoor amenities, including parks and recreational programs, may also be affected during periods of extreme heat.

Cascading Effects

Extreme heat can contribute to and exacerbate other hazards within the City of Napa. Prolonged high temperatures dry vegetation and increase wildfire risk in surrounding areas, while also contributing to degraded air quality, particularly during regional wildfire events. Heat can also intensify drought conditions by increasing evaporation rates and water demand, placing additional stress on local water resources.

Social and economic impacts are also associated with extreme heat. Households with limited financial resources may face challenges in maintaining adequate cooling or absorbing increased utility costs during prolonged heat events. These factors can contribute to disproportionate impacts on vulnerable populations and increase the need for targeted outreach and support.

3.5.2.8 Climate Change Hazard

Average annual temperatures across most of California have already increased by more than 1°F, with some areas experiencing rises of over 2°F when comparing the 1901 to 1960 average to that of 1986 to 2016. Daily maximum temperatures—a key indicator of extreme heat—are projected to increase by 4.4°F to 5.8°F by 2050 and by 5.6°F to 8.8°F by 2100. Heat waves that impact public health, known as heat-health events, are also expected to intensify across the state. By 2050, these events are projected to last up to two weeks longer in the Central Valley and occur four to ten times more often in the Northern Sierra region (California Natural Resources Agency, 2022).

California is already experiencing significant impacts from climate change, including prolonged drought, a lengthened wildfire season, increased coastal flooding and erosion, and widespread tree mortality. The state has observed rising average temperatures, more extreme heat days, fewer cold nights, a longer growing season, and shifts in the water cycle, with less winter precipitation falling as snow. In addition, summertime fog has declined by approximately 33%, and both snowmelt and rainwater runoff are occurring earlier in the year (Cal OES, 2018).

Long-term trends indicate a 12% to 20% decline in fog across California from 1900 through projections to 2070. Climate experts suggest that warming temperatures reduce the ability of air masses to cool enough to produce fog, which plays a critical role in supporting California's ecosystems (Grantham, Teodore; University of California, Berkeley, 2018).

The City of Napa is increasingly vulnerable to the long-term impacts of climate change, which function as hazard multipliers across the Napa Valley and broader North Bay region. Napa's location within an inland valley, combined with its proximity to San Pablo Bay and surrounding upland areas, creates a complex climate setting that is sensitive to shifts in temperature, precipitation patterns, and seasonal variability. Projected changes in these conditions are expected to intensify existing hazards, including flooding, drought, extreme heat, and wildfire.

Napa's valley topography contributes to localized climate effects, particularly during extreme heat events. Warm air can become trapped within the valley, reducing nighttime cooling and prolonging heat exposure compared to nearby coastal areas. As temperatures continue to rise, these conditions are expected to increase both the frequency and duration of heat events, placing additional stress on vulnerable populations such as older adults, children, outdoor workers, and residents without access to adequate cooling. Increased heat also drives higher energy demand, placing strain on the electrical grid and increasing the likelihood of service disruptions.

Sea Level Rise

The City of Napa is located at the southern end of Napa County adjacent to the Napa River and in proximity to the San Pablo Bay, making it one of the few jurisdictions in the county directly exposed to sea level rise and tidal flooding hazards. Although much of Napa County is inland and not affected by coastal processes, Napa's proximity to the Bay places some southern portions of the city at risk from rising sea levels, storm surge, and changes in tidal dynamics.

Sea level rise can lead to increased frequency and extent of tidal flooding, particularly in low-lying areas near the Napa River, wetlands, and shoreline zones. Areas that currently experience occasional flooding during high tides or storm events may be inundated more frequently as sea levels rise. In addition, higher baseline water levels can reduce the capacity of drainage systems to discharge stormwater, potentially leading to compound flooding during periods of heavy rainfall combined with high tides.

Critical infrastructure located near the Bay and river corridors may also be vulnerable to sea level rise. This includes transportation corridors, stormwater systems, wastewater infrastructure, and utilities, which may be affected by periodic inundation, corrosion, or reduced functionality over time. Wetlands and natural shoreline features may provide some buffering capacity, but they may also be impacted by rising water levels and changes in sediment dynamics.

Sea level rise may also contribute to secondary impacts, including saltwater intrusion into groundwater or soils, degradation of habitats, and increased maintenance needs for levees. In areas where development is located along tidal waterways, long-term exposure to rising water levels may affect land use, infrastructure planning, and property values.

Climate change projections for the San Francisco Bay Area indicate that sea levels are expected to continue rising over the coming decades, increasing the likelihood of both chronic tidal flooding and more severe

impacts during storm events. As a result, the City of Napa may face increasing pressure to plan for adaptation strategies, including improvements to flood protection infrastructure, enhancement of natural buffers such as wetlands, and integration of sea level rise considerations into future development and capital improvement planning.

Precipitation, Storms & Flooding

Although total annual precipitation may not significantly increase, climate projections indicate that rainfall is more likely to occur in fewer, more intense storm events. These high-intensity storms, often associated with atmospheric river systems, increase the risk of riverine flooding along the Napa River as well as localized flooding in urban areas with constrained drainage systems.

Intense rainfall following extended dry periods can also increase the risk of erosion, localized slope instability, and debris flows, particularly in hillside areas surrounding the valley floor and along transportation corridors. These conditions can impact critical infrastructure, damage roadways, and disrupt emergency access. In addition, sea level rise combined with higher peak flows in the Napa River and its tributaries may exceed existing system capacity during extreme events, contributing to flooding beyond currently mapped floodplain boundaries.

Drought & Water Reliability

Climate change is expected to result in more frequent and prolonged drought conditions across Napa County. While the City of Napa benefits from a combination of local and regional water sources, extended dry periods can reduce water availability, increase demand, and place stress on both surface water and groundwater systems. Reduced precipitation and earlier snowmelt in upstream watersheds may affect reservoir storage and seasonal water supply reliability.

Drought conditions also have broader environmental and hazard implications. Reduced soil moisture and vegetation stress increase susceptibility to wildfire in surrounding areas, while also affecting urban landscaping and tree canopy health within the city. Prolonged dry conditions may also impact local creeks and riparian systems, which play an important role in stormwater conveyance, habitat, and groundwater recharge.

Wildfire & Vegetation Change

Climate-driven increases in temperature and changes in precipitation patterns are expected to extend the wildfire season and increase fire risk in areas surrounding the City of Napa. While much of the city is urbanized, it is bordered by wildland and open space areas that are susceptible to wildfire. Fires in surrounding areas can affect the city through evacuation impacts, degraded air quality, and strain on emergency services.

Changes in vegetation patterns, including increased tree mortality and shifts in species composition, may contribute to higher fuel loads over time. Even when wildfire does not directly impact the City, smoke and poor air quality can have significant public health consequences, particularly for sensitive populations.

Cascading Effects

Climate change amplifies interactions between hazards, creating compounding risks for the City of Napa. Extreme heat can worsen drought conditions and increase wildfire potential, while drought-stressed landscapes are more susceptible to erosion during intense storm events. Severe storms may damage infrastructure already stressed by heat or aging conditions, while flooding can disrupt transportation and utility systems needed for emergency response.

These cascading effects underscore the importance of integrating climate considerations into hazard mitigation planning, infrastructure investment, emergency preparedness, and community outreach. As climate conditions continue to evolve, proactive planning will be critical to reducing long-term risk and enhancing community resilience.

3.5.3 Climate Change Impacts & Vulnerable Populations

Climate change is expected to exacerbate many of the natural hazards affecting the City of Napa, increasing risks to populations that already face social, economic, or physical vulnerabilities. Rising temperatures, more extreme precipitation events, prolonged drought, and more frequent extreme heat events are projected to intensify existing hazard conditions and create additional challenges for public health, safety, infrastructure, and emergency response. These changes will also place increased demand on water, energy, and lifeline systems, requiring greater operational flexibility to maintain service to critical facilities and vulnerable residents.

Certain populations in Napa are more likely to experience disproportionate impacts from climate-related hazards. Older adults, individuals with disabilities, low-income households, renters, unhoused individuals, and households with limited English proficiency may have reduced capacity to prepare for, respond to, and recover from hazard events. These groups may face barriers related to mobility, access to transportation, financial resources, housing stability, and timely access to emergency information, increasing their overall vulnerability.

Extreme heat presents a growing risk to vulnerable populations, particularly seniors, medically fragile individuals, outdoor workers, people experiencing homelessness, and households without reliable air conditioning. Climate projections indicate that extreme heat events will become more frequent, intense, and prolonged, increasing the likelihood of heat-related illness and exacerbating existing health conditions. These events also increase demand on energy systems, potentially straining infrastructure and affecting the City's ability to maintain reliable service during peak conditions.

Flooding hazards, which are concentrated along the Napa River and its tributaries, disproportionately affect residents and workers located within mapped flood hazard areas. More than 12,000 residents and thousands of parcels are located within these zones, with exposure including mobile home parks and lower-income neighborhoods that may face greater challenges in recovery. In addition, unhoused individuals living along the Napa River and creeks face heightened life-safety risks during flood events due to barriers in receiving warnings and evacuating safely. Flooding also threatens critical facilities, lifeline infrastructure, and transportation systems, which can disrupt access to essential services.

Drought and water supply challenges are expected to intensify under changing climate conditions. Increasingly frequent and severe droughts will require long-term demand management and efficient use of water resources to maintain supply reliability. These conditions can increase utility costs and place additional burdens on vulnerable households, particularly those with limited financial resources. Reduced water availability may also affect local economic activity, including agriculture and tourism, and contribute to vegetation stress that increases wildfire risk.

Wildfire and smoke impacts are also expected to increase in frequency and duration, affecting Napa through degraded air quality, public safety power shutoffs, and disruptions to daily activities and economic activity. Vulnerable populations, including individuals with respiratory conditions, older adults, children, and outdoor workers, are particularly sensitive to smoke exposure. Limited access to clean indoor air, filtration systems, or protective equipment can further increase health risks.

Severe weather events, including heavy rainfall and high winds, may become more frequent and intense, contributing to localized flooding, infrastructure damage, and power outages. These events can disrupt transportation networks, block evacuation routes, and limit emergency response capabilities. Power outages associated with high winds and public safety shutoffs may further impact vulnerable populations who rely on electricity for medical equipment or basic needs.

Climate change may also increase the frequency and duration of poor air quality events and compound risks across multiple hazard types. These cascading effects highlight the importance of integrating climate adaptation, public outreach, and equitable mitigation strategies into planning efforts to reduce long-term risk and improve community resilience.

3.5.4 Hazard Problem Statements

As part of the mitigation action identification process, the Planning Committee for each jurisdiction identified areas of concern (aka problem statements) for their respective facilities based on the risk assessment and vulnerability analysis, utilizing the RAMP mapping and static snapshot maps. Problem statements focused on the impact, victim, or threat that the hazard could create in the jurisdiction, as described in Table 3-16. Identifying common issues and weaknesses through these problem statements assisted the planning group in understanding the realm of resources needed for mitigation.

The goal is to have at least one mitigation action for every problem statement. Projects or actions have been developed to mitigate each problem identified. See Table 3-18 for a full list of mitigation actions and corresponding problem statements that they address. Each problem statement is coded with a problem number for cross-referencing between Table 3-16 and Table 3-18

Table 3-16: City of Napa Hazard Problem Statements

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-AH-CN-47	All Hazard	Threat	**City of Napa**	The existing Emergency Operations Center (EOC) and associated technology are undersized and lack the redundancy, and multi-agency workspace needed to support coordinated response and recovery for large, multi-day hazard events.	ma-AH-CN-1, ma-AH-CN-4, ma-AH-CN-13, ma-AH-CN-0, ma-AH-CN-8
ps-CC-CN-1	Climate Change	Impact	**City of Napa**	Some community members remain unaware of the City's climate adaptation and mitigation efforts and of actions they can take to reduce risk (e.g., home weatherization, defensible space), limiting participation in resilience programs and behavior change.	ma-AH-CN-3, ma-AH-CN-5
ps-CC-CN-4	Climate Change	Victim	**City of Napa**	Climate change is expected to increase the frequency and severity of extreme heat, drought, severe weather, wildfire and smoke, and flooding in and around Napa, compounding impacts on vulnerable populations and lifeline services.	ma-CC-CN-51, ma-AH-CN-0, ma-AH-CN-3, ma-AH-CN-7, ma-AH-CN-8, ma-WF-CN-43, ma-WF-CN-41, ma-FL-CN-24, ma-EW-CN-58, ma-FL-CN-28, ma-DR-CN-16
ps-CC-CN-19	Climate Change	Impact	**City of Napa**	The compounding effects of sea level rise, king tide, and severe weather events may increase the frequency and severity of flooding.	ma-FL-CN-23, ma-FL-CN-24, ma-FL-CN-27, ma-FL-CN-28, ma-FL-CN-29, ma-AH-CN-3
ps-DF-CN-41	Dam Failure	Threat	**City of Napa**	Dam-failure risk and response planning may not be fully integrated into City and County emergency operations plans, resulting in unclear roles, evacuation priorities, and communication protocols for a multi-jurisdictional dam-break event.	ma-DF-CN-15, ma-DF-CN-52, ma-AH-CN-0, ma-AH-CN-8
ps-DF-CN-43	Dam Failure	Victim	**City of Napa**	Tens of thousands of residents and dozens of critical facilities in the City of Napa are located within dam inundation areas associated with Hennessey, Conn, Bell Canyon, Milliken, and Soda Canyon dams, creating life-safety and displacement risks in a failure scenario.	ma-DF-CN-52, ma-DF-CN-15, ma-CC-CN-51, ma-AH-CN-3, ma-AH-CN-7

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-DR-CN-29	Drought	Threat	**City of Napa**	Increasingly frequent and severe droughts, are accounted for in the City's Urban Water Management Plan including a 10% reduction in water supplies starting in 2035. Long-term demand management and maximizing use of water resources will be necessary to ensure water supply reliability, and maintain service levels.	ma-DR-CN-16
ps-DR-CN-31	Drought	Impact	**City of Napa**	Drought impacts to the Napa Valley American Viticultural Area (AVA) can reduce agricultural productivity, degrade landscape quality, and negatively affect Napa's tourism- and agriculture-based economy.	ma-AH-CN-3, ma-DR-CN-54, ma-DR-CN-16
ps-DR-CN-33	Drought	Victim	**City of Napa**	The City provides bilingual education and outreach to community members but some water customers may lack action on reducing water consumption and free conservation incentives, particularly during drought emergencies, leading to uneven participation and higher burdens on vulnerable households.	ma-DR-CN-54, ma-AH-CN-3, ma-DR-CN-16
ps-EQ-CN-5	Earthquake	Impact	**City of Napa**	Community assets and critical facilities, including schools, elder care facilities, bridges, historic downtown structures, and small businesses, may be vulnerable to strong shaking, threatening long-duration closures, economic losses, and loss of cultural and historic resources.	ma-EQ-CN-18, ma-EQ-CN-18, ma-AH-CN-8, ma-EQ-CN-20
ps-EQ-CN-6	Earthquake	Impact	**City of Napa**	Some of the City's water, wastewater, stormwater, and electric systems may lack full redundancy and backup power at key nodes, which may increase the risk of lifeline disruption and limited emergency response capacity following a major earthquake.	ma-EQ-CN-20, ma-AH-CN-0
ps-EQ-CN-7	Earthquake	Victim	**City of Napa**	All Napa residents live in severe shaking zones associated with the West Napa Fault scenario, with renters, mobile home residents, seniors, and lower-income households facing disproportionate risk of injury, displacement, and loss of housing stability.	ma-EQ-CN-17, ma-EQ-CN-56, ma-AH-CN-3, ma-EQ-CN-18
ps-FL-CN-20	Flood	Impact	**City of Napa**	Multiple critical facilities, including fire stations, communications towers, the Corporation Yard, and other assets, are located within the 100-YR floodplain and remain exposed to riverine and backwater flooding as the Napa River Flood Project continues to be implemented.	ma-FL-CN-49, ma-FL-CN-24, ma-FL-CN-23, ma-AH-CN-13, ma-AH-CN-8, ma-FL-CN-28
ps-FL-CN-22	Flood	Victim	**City of Napa**	More than 12,500 residents and approximately 4,500 parcels with improvements valued at $1.6 billion lie within mapped flood hazard zones; flood risk is concentrated along the Napa River and tributaries, with mobile home parks and lower-income neighborhoods facing disproportionate consequences.	ma-FL-CN-49, ma-FL-CN-23, ma-FL-CN-62, ma-AH-CN-3, ma-CC-CN-51, ma-AH-CN-7, ma-FL-CN-28

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-FL-CN-23	Flood	Threat	**City of Napa**	Outdated flood hazard mapping and limited public awareness of flood risk and property owner drainage maintenance responsibilities contribute to flood exposure and can hinder risk-reduction investments by property owners.	ma-FL-CN-30, ma-FL-CN-23, ma-FL-CN-28
ps-FL-CN-27	Flood	Victim	**City of Napa**	Unhoused residents living in encampments along the Napa River and creeks face barriers to receiving warnings and evacuating quickly during flood events, increasing life-safety risks and complicating emergency response.	ma-AH-CN-7, ma-AH-CN-3
ps-CC-CN-0	High Heat	Impact	**City of Napa**	The City's water and energy systems will require additional capacity and operational flexibility to serve increased demand during more frequent and longer extreme heat events, while also maintaining service to critical facilities and vulnerable residents.	ma-DR-CN-16
ps-CC-CN-2	High Heat	Victim	**City of Napa**	Seniors, residents of mobile home parks, medically fragile individuals, people experiencing homelessness, households without reliable air conditioning, and outdoor workers face disproportionate health and safety risks during extreme heat events.	ma-AH-CN-3, ma-CC-CN-51, ma-AH-CN-7
ps-CC-CN-17	High Heat	Threat	**City of Napa**	Climate change is expected to lead to increases in the frequency, intensity, and duration of extreme heat events, which are likely to increase the risk of heat-related illness and exacerbation of existing chronic health conditions.	ma-CC-CN-51, ma-CC-CN-14, ma-AH-CN-7
ps-EW-CN-34	Severe Weather	Impact	**City of Napa**	Heavy rain and atmospheric river events may cause localized street flooding and hazardous travel conditions at known drainage bottlenecks due to undersized culverts, blocked storm drains, and limited detention capacity.	ma-FL-CN-49, ma-AH-CN-13, ma-AH-CN-3, ma-FL-CN-24
ps-EW-CN-35	Severe Weather	Threat	**City of Napa**	Climate change is expected to increase the frequency and severity of high wind and atmospheric river events in the City of Napa and surrounding areas.	ma-EW-CN-58, ma-FL-CN-24
ps-EW-CN-36	Severe Weather	Impact	**City of Napa**	Backup generators are needed to maintain continuity of City utilities and services during severe weather events.	ma-AH-CN-57, ma-EW-CN-58
ps-EW-CN-39	Severe Weather	Impact	**City of Napa**	Increasingly frequent high-wind events and PSPS outages may down trees and utility lines, exacerbate wildfire risk, block evacuation routes, and disrupt power, communications, and other essential services across the city.	ma-WF-CN-45, ma-AH-CN-8, ma-EW-CN-58
ps-WF-CN-11	Wildfire	Impact	**City of Napa**	Napa's wastewater treatment facility, raw water conveyance systems, communication facilities, and watershed lands, including the Lake Hennessey drainage area, are vulnerable to wildfire and post-fire erosion, threatening water quality, supply reliability, and critical communications.	ma-WF-CN-43, ma-WF-CN-41

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-WF-CN-12	Wildfire	Impact	**City of Napa**	Longer, more intense wildfire seasons and smoke events are expected to continue affecting Napa, increasing the likelihood of repeated smoke impacts, PSPS events, and regional wildfires that disrupt outdoor commerce and tourism.	ma-WF-CN-45, ma-WF-CN-45, ma-WF-CN-41, ma-WF-CN-50, ma-WF-CN-44, ma-WF-CN-42, ma-AH-CN-9, ma-WF-CN-61, ma-AH-CN-3, ma-CC-CN-51, ma-AH-CN-7, ma-WF-CN-43
ps-WF-CN-14	Wildfire	Impact	**City of Napa**	WUI areas and open space, including Westwood Hills Park, Timberhill Park and adjacent hillsides, contain heavy fuel loads and access constraints that could lead to fast-moving fires, impediments to deploying firefighting resources, and threats to nearby homes and evacuation routes.	ma-WF-CN-50, ma-AH-CN-8, ma-WF-CN-41, ma-WF-CN-43

3.6 Mitigation Strategy

This section provides the framework for how the City of Napa will reduce hazard risk within its jurisdiction while supporting the broader goals of the Napa County MJHMP. It includes an overview of existing capabilities, opportunities to strengthen resilience, and the city's prioritized mitigation actions. Together, these elements demonstrate how Napa integrates hazard awareness into its planning and development processes while contributing to a coordinated countywide approach.

Within the Napa County MJHMP, the mitigation strategy serves as the roadmap for future hazard mitigation efforts. For Napa, the strategy outlined in this annex reflects the outcomes of the countywide planning process while also addressing the city's unique risks, priorities, and community needs. The strategy is designed to reduce vulnerabilities identified in the risk assessment, including the problem statements developed for flooding, earthquakes and liquefaction, slope failure, wildfire, drought, severe storms, extreme heat, and climate change.

Mitigation actions identified in this annex include both policy-based and project-based initiatives, with an emphasis on integrating resilience into land use planning, infrastructure investments, and community programs. Actions are structured to align with FEMA's requirements and to coordinate with existing city, county, and regional planning mechanisms. Each action identifies responsible parties, potential funding sources, and the resources needed for implementation.

For Napa, this strategy provides a framework for strengthening resilience by combining city-led initiatives, such as infrastructure improvements, building code enforcement, and community preparedness, with regional coordination through the MJHMP. By advancing these efforts in alignment with the General Plan

and other local planning documents, the City of Napa staff can reduce hazard risk while supporting long-term community safety, sustainability, and economic stability. The subsections that follow describe these elements in detail:

- **Sections 3.6.1, Capabilities and Opportunities,** provides a summary of the city's capacity to address natural hazards.
- **Section 3.6.2, Mitigation Action Plan,** presents Napa's prioritized actions to guide implementation in coordination with countywide strategies.
- **Section 3.6.3, Status of Previous Mitigation Actions,** provides a summary of all previous actions and their current status, whether completed, cancelled, or revised.

Aligning the Action Plan

This section connects Napa's mitigation actions with its existing capabilities and areas for growth. Capability assessments are a required element of hazard mitigation planning under the Disaster Mitigation Act of 2000 and FEMA's 2023 guidance, ensuring that actions are realistic, achievable, and aligned with available resources.

The section begins with a summary of Napa's capabilities across four areas: planning and regulatory, administrative and technical, fiscal, and education and outreach. This overview highlights the tools and strengths that the district already uses to reduce hazard risk. The section then provides a detailed analysis of each capability area, identifying both current practices and opportunities to expand resilience.

3.6.1 Capabilities & Opportunities

This section provides a detailed assessment of the city's current capabilities to support hazard mitigation, as well as future opportunities. This consists of describing how the city is planning for hazards and growth and a summary of its existing capabilities and the potential for enhancement.

3.6.1.1 Planning for Hazards & Growth

The City of Napa has adopted a comprehensive approach to balancing growth with hazard mitigation, recognizing that its location within the Napa Valley presents both development opportunities and exposure to natural hazards. Since its incorporation, the City has emphasized thoughtful land use planning to support economic vitality, maintain community character, and reduce vulnerability to hazards such as flooding, wildfire, and seismic activity.

Long-Range Planning & Growth Management

The City's General Plan provides the framework for future growth and development, emphasizing infill development, redevelopment, and efficient land use within existing urban boundaries rather than outward expansion. Much of Napa is already developed, and future growth is expected to occur through

redevelopment of underutilized sites, adaptive reuse, and targeted infill in established areas, including downtown Napa, commercial corridors, and transit-accessible locations.

The Housing Element identifies capacity for additional residential development to meet state housing requirements, with an emphasis on higher-density and mixed-use projects that support walkability and reduce reliance on expansion into undeveloped or hazard-prone areas. This approach allows the City to accommodate growth while minimizing exposure to wildfire risk in surrounding hillsides and open space areas.

Downtown Napa and surrounding mixed-use areas continue to serve as focal points for revitalization and economic development. Ongoing and planned projects integrate housing, commercial uses, and public spaces while incorporating modern infrastructure improvements and resilience considerations. These efforts support both community development and hazard mitigation objectives by directing growth toward areas with existing services and infrastructure capacity.

As part of its planning framework, the City integrates hazard information from the Hazard Mitigation Plan into land use decisions, capital improvement planning, and development review processes. Updated mapping, risk assessment tools, and climate considerations are used from this plan to inform where and how development occurs, helping to reduce long-term risk and improve resilience.

By focusing on infill development, infrastructure investment, and risk-informed planning, the City of Napa continues to guide growth in a manner that is sustainable, resilient, and responsive to evolving environmental and hazard conditions.

Building Codes & Development Standards

The City of Napa emphasizes resilient growth management through the integration of state building codes, local ordinances, and hazard-informed development standards. As with other California jurisdictions, Napa enforces some of the most rigorous building regulations in the country, ensuring that new development and redevelopment meet high standards for structural safety, sustainability, and hazard resilience.

The City is required to regularly update its development regulations to remain consistent with the **California Building Code (CBC)**, which is revised on a three-year cycle and most recently updated in 2025. The CBC establishes minimum standards for structural integrity, seismic performance, fire resistance, and accessibility. In addition, Napa enforces the **California Fire Code**, **California Residential Code**, and **California Green Building Standards Code (CALGreen)**, which incorporate requirements related to energy efficiency, sustainable construction, and climate adaptation. Together, these codes provide the foundation for reducing long-term risk through the built environment.

The City of Napa Municipal Code includes several chapters and provisions that directly address natural hazards and risk reduction, providing a regulatory framework that supports hazard mitigation and resilience. These hazard-related regulations are distributed across multiple titles and address a range of hazards including flooding, seismic risk, wildfire, drought, and water supply reliability.

Water supply, drought, and water conservation are addressed under Title 13 – Public Services, which includes Chapter 13.04 (Water Service System), Chapter 13.09 (Water Conservation Regulations), and Chapter 13.10 (Water Shortage Regulations). These chapters establish policies and operational procedures to manage water demand, respond to drought conditions, and ensure long-term water supply reliability.

Flood hazards are addressed through multiple regulatory mechanisms. Within Title 17 – Zoning, Chapter 17.38 (Floodplain Management Overlay District) establishes requirements for development within flood-prone areas, including permitting, development standards, and floodplain administrator responsibilities. Additional flood-related provisions are included in Title 15 – Buildings and Construction, which incorporates state building standards and drainage requirements, and in Title 8 – Health and Safety, Chapter 8.36 (Storm Water Quality Control), which regulates stormwater runoff and water quality.

Seismic hazards are addressed through Title 15 – Buildings and Construction, including provisions adopting the California Building Code and related standards for seismic design and structural safety. In particular, Chapter 15.110 (Review, Rehabilitation and Abatement of Existing Seismically Unsafe Buildings) establishes requirements for identifying and mitigating risks associated with vulnerable structures.

Wildfire risk is addressed through adoption of the California Fire Code and the California Wildland-Urban Interface (WUI) Code within Title 15, which establish construction standards, defensible space requirements, and fire-resistant design measures for development in fire-prone areas.

Additional hazard-related provisions are incorporated through zoning overlays and site development standards within Title 17, including hillside development controls (Chapter 17.40 – Hillside Overlay District), watercourse setbacks (Chapter 17.50 – Water Setback Overlay District), and other land use regulations that limit development in hazardous areas.

Finally, emergency management and disaster preparedness are addressed in Title 2 – Personnel and Administration, including Chapter 2.88 (Continuity in Government) and Chapter 2.89 (Emergency and Disaster Preparedness), which establish the City's framework for emergency response, coordination, and continuity of operations.

Together, these chapters demonstrate that the City of Napa has dedicated and integrated regulatory mechanisms addressing major natural hazards, including flooding, seismic risk, wildfire, and drought, as well as broader emergency management and infrastructure resilience considerations.

In addition to these regulatory measures, the City of Napa participates in the **National Flood Insurance Program (NFIP)**, which requires development within mapped flood hazard areas to meet or exceed established flood protection standards. This participation supports continued eligibility for flood insurance and reinforces community-wide flood risk reduction.

Through the consistent application of these codes, policies, and regulatory tools, the City of Napa ensures that new development is either directed away from hazard-prone areas or designed to withstand identified risks, supporting long-term resilience and sustainable growth.

California Environmental Quality Act (CEQA)

The California Environmental Quality Act (CEQA) requires General Plans, Specific Plans, and major development projects to evaluate hazards such as flooding, wildfire, seismic risk, and slope instability. Environmental documents must identify these risks and propose mitigation measures to reduce impacts, which may include infrastructure upgrades, evacuation planning, geotechnical design standards, or limits on development in high-risk areas.

CEQA plays an important role in Napa's planning and development framework, ensuring that growth decisions incorporate environmental and hazard considerations. City of Napa serves as the lead agency for local projects, meaning the city must prepare and certify environmental review documents before approving discretionary development. These include Initial Studies, Mitigated Negative Declarations (MNDs), and Environmental Impact Reports (EIRs) depending on the project's scope and potential impacts.

City of Napa recently integrated CEQA compliance into its 2022 General Plan update, which included an Environmental Impact Report (EIR) prepared pursuant to CEQA Guidelines. The General Plan EIR evaluates the impacts allowed by development policies in topic areas such as geology and soils (earthquakes, slope failure), hydrology and water quality (flooding and stormwater), biological resources, wildfire hazards, greenhouse gas emissions, and climate change. By addressing these issues at the General Plan level, Napa is able to use a tiered CEQA review process for future projects, streamlining environmental review for developments that are consistent with General Plan policies while still requiring project-specific mitigation for issues not fully analyzed in the program EIR.

Through CEQA, Napa must identify significant impacts, consider alternatives, and adopt mitigation measures, such as slope stabilization, defensible space, stormwater controls, or floodproofing. The City's Safety Element and Municipal Code ensure these mitigation measures become enforceable project conditions. This process also enhances transparency, as CEQA requires public participation—residents, businesses, and stakeholders can review draft environmental documents and comment on hazard and environmental concerns before final approvals.

3.6.1.2 Development & Hazard Considerations

The City of Napa encompasses approximately 18 square miles and serves as the economic and governmental center of Napa County, with a mix of urban, suburban, and industrial land uses. Unlike smaller, more constrained jurisdictions, Napa includes both developed urban areas and remaining opportunities for infill and redevelopment. While much of the city is built out, future growth is expected to occur primarily through infill development, redevelopment of underutilized parcels, and targeted development within mixed-use and commercial corridors, including downtown Napa and areas along major transportation routes. Additional incremental development may occur through adaptive reuse of existing commercial and industrial sites and limited expansion within designated planning areas.

Napa's regulatory framework requires that new development conform to California's strict planning and building codes, as well as local floodplain management, seismic safety, and fire protection standards. These

measures reduce, but do not eliminate, exposure to natural hazards. As the City continues to accommodate housing and economic development, hazard considerations remain central, particularly given the presence of the Napa River, surrounding hillsides, and proximity to wildfire-prone areas.

Flood Hazards: Flood risk in the City of Napa is primarily associated with the Napa River and its tributaries, including Napa Creek, Tulucay Creek, and other drainage systems that traverse the city. FEMA Flood Insurance Rate Maps (FIRMs) identify portions of the city within the 1% and 0.2% annual chance floodplains, particularly in low-lying areas near the river corridor, downtown Napa, and southern portions of the city. While major flood control improvements have reduced risk in many areas, a significant number of residents, structures, and critical infrastructure remain exposed. Future development and redevelopment in these areas require compliance with floodplain management regulations, including elevation standards, flood-resistant construction, and stormwater management measures to reduce localized flooding.

Wildfire Hazards: While much of the City of Napa is urbanized, it is bordered by wildland and open space areas that are susceptible to wildfire. Hillside areas and the urban–wildland interface along the eastern and western edges of the city face the greatest risk. New and redeveloped structures in these areas must comply with California Fire Code and Wildland-Urban Interface (WUI) standards, including defensible space requirements, ignition-resistant construction, and fire-safe landscaping. Wildfires in surrounding areas may also affect the city through evacuation needs, degraded air quality, and strain on emergency response resources.

Seismic and Liquefaction Hazards: The City of Napa is located in a seismically active region and is subject to strong ground shaking from nearby faults, including the West Napa Fault Zone. In addition, portions of the city, particularly along the Napa River corridor and valley floor, are underlain by alluvial soils with moderate to high liquefaction susceptibility. A major earthquake could result in structural damage, ground settlement, pipeline rupture, and disruption to transportation and utility systems. Future development in these areas must incorporate seismic design standards, geotechnical investigations, and appropriate foundation and infrastructure design to reduce the risk of earthquake-related damage.

Drought: The City of Napa relies on a combination of local and regional water sources, including surface water and groundwater supplies. Extended drought conditions, which are expected to become more frequent and severe with climate change, can reduce water availability and increase demand. Growth and development will place additional pressure on water resources, requiring continued emphasis on water conservation, efficient infrastructure, and long-term supply planning. Local policies and programs support reduced water use, drought-tolerant landscaping, and system reliability to address these challenges.

If development occurs within hazard-prone areas, municipal codes require implementation of measures to reduce risk and minimize potential losses. To support community safety, emergency response and evacuation planning must consider local demographics, including vulnerable populations, as well as potential impacts such as service disruptions and limited access during hazard events. Overall, the City's approach to managed growth, combined with regulatory requirements and hazard mitigation planning, is

intended to ensure that future development does not significantly increase vulnerability to identified hazards.

3.6.1.3 Capabilities & Opportunities Assessment

To develop a realistic and actionable mitigation strategy, it must account for existing jurisdictional capabilities and what future opportunities there are to enhance those capabilities for purposes of hazard mitigation. This section provides an assessment of the City of Napa's existing capabilities and future opportunities, including planning and regulatory, administrative and technical, fiscal, and public outreach and education capabilities. This assessment also identifies opportunities to integrate this MJHMP into future planning, policies, or programs to weave mitigation efforts into daily operations and address hazard problems wholistically. Capabilities are categorized into four groups and include various mechanisms.

- **Planning and Regulatory Capabilities:** Existing long-range plans, emergency response plans, hazard-specific plans, land use policies, and building and development standards.
- **Administrative and Technical Capabilities:** Available expertise in emergency services, engineering, grant management, and community planning.
- **Fiscal Capabilities:** Budgetary capacity, taxing authority, grants, and other funding mechanisms that can support mitigation projects.
- **Outreach and Education Capabilities:** Existing programs for providing technical assistance, community education, public warnings, and stakeholder engagement.

A full description of the process used to develop the capabilities assessment is provided in Volume 1, Section 2.3.3.

This capabilities and opportunities assessment for the City of Napa lists the various types of capabilities along with how they have been, currently are, or will in the future be integrated into hazard mitigation planning efforts. The three "HMP Integration" columns that identify the capability's status and usage are color-coded with green, yellow, or orange shading to communicate the following:

- **Status:** If the capability is present at all and what level of use it has generally.
- **Current Mitigation Use:** If the capability is currently being used in mitigation efforts, specifically, and at what level.
- **Future Opportunity:** If there is a future opportunity to integrate the capability into mitigation efforts and at what level.

Summary of Capabilities & Opportunities

This Capabilities and Opportunities Assessment for the City of Napa summarizes the various types of capabilities it has for hazard mitigation currently. The assessment also identifies opportunities to integrate, expand, and improve the city's capabilities for future hazard mitigation. Table 3-17 provides a comprehensive list of capabilities and identifies the current status, current mitigation use, and future opportunities.

Planning & Regulatory

The City of Napa has strong planning and regulatory capabilities that support hazard risk reduction and resilient development. The City enforces the California Building Code (Title 24) through Title 15 of the Napa Municipal Code, along with locally adopted ordinances addressing floodplain management, hillside development, watercourse setbacks, stormwater quality control, water conservation, and seismic safety. These regulations are implemented through zoning, subdivision, and site plan review processes, ensuring that hazard considerations are integrated into development decisions.

Growth management is guided by the City of Napa 2040 General Plan, including the Land Use and Community Design Element and the Safety and Noise Element, which address geologic, seismic, flood, wildfire, and climate-related hazards. Capital investments are prioritized through the City's five-year Capital Improvement Program (CIP), which includes projects related to water, stormwater, transportation, and public facilities that enhance resilience. The City also maintains a range of hazard reduction programs, including stormwater management and erosion control (enforced through Chapter 8.36), water conservation regulations (Chapter 13.09), weed abatement, and public outreach initiatives such as Flood Awareness Week and Ready Napa County programs.

The City participates in the National Flood Insurance Program (NFIP) and enforces local floodplain management regulations through Chapter 17.38 (Floodplain Management Overlay District), supported by FEMA Flood Insurance Studies and updated mapping. Napa also participates in the Community Rating System (CRS) and maintains a Class 7 rating, reflecting an advanced level of floodplain management and public outreach. Elevation certificates, floodplain permitting, and insurance education are administered through the Community Development Department.

While overall regulatory capacity is strong, some areas present opportunities for enhancement, including continued integration of environmental justice considerations, expansion of non-structural seismic safety programs, and increased public awareness of hazard risks and mitigation actions.

Future integration of the MJHMP will occur through various processes and mechanisms outlined across multiple mitigation actions (Table 3-18). Key opportunities for future hazard mitigation integration with the City of Napa's existing planning mechanisms include incorporating the updated risk assessment, hazard-specific vulnerability findings, and projected climate change impacts into the Enhanced Pre- & Post-Disaster Coordination (ma-AH-CN-8), Unified Community Hazard Education & Preparedness Program (ma-AH-CN-3), Communications System Resilience (ma-AH-CN-0), Flood Mapping & Risk Communication Updates (ma-FL-CN-28), and Napa River Flood Project & Residual Risk Reduction (ma-FL-CN-23).

Administrative & Technical

The City of Napa has strong administrative and technical capacity to support hazard mitigation planning, implementation, and coordination across departments. Core functions related to planning, development review, engineering, and infrastructure are managed by the Community Development Department and

Public Works Department, including Planning, Building, Development Engineering, and Transportation Engineering divisions.

The City has access to qualified personnel in key functional areas, including community planning, land development review, construction engineering, transportation planning, and natural resource management. The Building Division administers building codes and safety standards, while the Public Works Director serves as the Floodplain Administrator. Emergency management functions are coordinated through the Fire Department and Office of Emergency Services, ensuring alignment between preparedness, response, and recovery activities.

Technical capabilities are supported by GIS resources within Public Works and Community Development, as well as coordination with Napa County GIS services. While the City maintains strong baseline capacity, certain functions—such as resiliency planning, public outreach, and grant management—are currently distributed across departments rather than supported by dedicated staff. This shared approach is effective for current operations but represents an opportunity to expand capacity as climate adaptation and mitigation efforts grow.

Warning Systems & Services

The City of Napa has well-established warning and emergency communication capabilities to notify residents, businesses, and visitors of hazardous conditions. The primary system is the Alert Napa County emergency notification system (Everbridge), which provides real-time alerts related to flooding, wildfire, earthquakes, severe weather, and other emergencies.

Emergency information is also disseminated through City and Fire Department social media platforms, websites, and coordinated regional messaging. These systems are designed to provide redundancy and ensure that critical information reaches a broad audience, including during rapidly evolving incidents. The City's warning systems support all major hazard types and are integrated with countywide emergency response efforts.

Fiscal

The City of Napa has strong fiscal capacity to support hazard mitigation through a combination of local funding mechanisms, fees, and financing tools. Utility fees for water and wastewater services support infrastructure reliability and improvements related to drought resilience and system capacity. Development impact fees contribute to funding for stormwater infrastructure, transportation improvements, fire protection, and other public services necessary to support safe growth.

The City maintains access to financing mechanisms including general obligation bonds and special tax or revenue bonds, which can be used to fund large-scale capital projects. The Capital Improvement Program (CIP), adopted as part of the annual budget process, prioritizes investments in infrastructure that support public safety and hazard mitigation.

Additional funding sources include Community Development Block Grants (CDBG), which can support housing rehabilitation and infrastructure improvements benefiting vulnerable populations. While tools such as benefit assessments and special-purpose taxes are not currently widely utilized, they represent potential opportunities for expanding hazard mitigation funding in the future. Stormwater-related fees and drainage plan review processes also contribute to funding for localized flood mitigation.

Education & Outreach

The City of Napa has strong education and outreach capabilities that support public awareness, preparedness, and risk reduction. The City maintains a website with hazard-specific information related to emergency preparedness, floodplain management, wildfire prevention, and climate action. Social media platforms, including those managed by the City and Fire Department, are actively used to disseminate information and provide updates during emergencies.

The City participates in annual public safety and preparedness events, including Fire Prevention Week, Flood Awareness Week, the Great California ShakeOut, and Ready Napa County initiatives. Community-based preparedness is supported through programs such as the Community Emergency Response Team (CERT) and partnerships with organizations including Napa Valley COAD and the Napa Communities Fire Safe Council.

City staff provide technical assistance to the public through multiple channels, including phone, email, and web-based inquiries, particularly for floodplain regulations, development standards, and emergency preparedness. While digital outreach is strong, printed materials and in-person resources are more limited, representing an opportunity to expand engagement with populations that may have reduced access to online information. Additional opportunities include expanding Firewise participation and enhancing targeted outreach to vulnerable populations.

ASSESSMENT LEGEND
HMP Integration

Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Table 3-17: City of Napa Capabilities and Opportunities Assessment

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Planning and Regulatory Capabilities				
Construction and Future Development Regulations				
Building Codes				California Building Code (California Code of Regulations, Title 24) adopted under Ch 15.04
BCEGS Rating				
Public Protection (ISO Class)				
Hazard-Related Development Standards				Floodplain Management Overlay District (Ch 17.38), Hillside Overlay District (Ch 17.40), Water Setback Overlay District (Ch 17.50), Rehabilitation and Abatement of Existing Seismically Unsafe Buildings (Ch 15.110), Water Conservation Regulations (Ch 13.09), Storm Water Quality Control (Ch 8.36), and Weed Abatement (Ch 8.24)
Zoning Ordinance				Title 17 (Zoning) implements land-use and siting standards, floodplain management regulations, and hillside regulations
Hazard-Specific Ordinance				Floodplain Management Overlay District (Ch 17.38), Hillside Overlay District (Ch 17.40), Water Setback Overlay District (Ch 17.50), Rehabilitation and Abatement of Existing Seismically Unsafe Buildings (Ch 15.110), Water Conservation Regulations (Ch 13.09), Storm Water Quality Control (Ch 8.36), and Weed Abatement (Ch 8.24)
Growth Management Ordinance				City of Napa 2040 General Plan Land Use and Community Design Element
Hazard Reduction Programs (Annually Conducted)				
Capital Improvements Program (CIP) or Plan				5-yr CIP covers hazard reduction projects including for water, stormwater, streets, and facilities
Erosion/Sediment Control Program				Ch 8.36 Storm Water Quality Control; enforced through SWPPP and NPDES permitting
Hazard-Related Public Outreach Program				Flood Awareness Week, weed abatement notices, ReadyNapa/County OES programs
Urban Water Management Plan				Updated 2021; integrates drought, water reliability, and conservation planning
Stormwater Management Program (Annual Inspections)				Conducted by Public Works Dept; enforced through Ch 8.36 Storm Water Quality Control, SWPPP and NPDES permitting
Seismic Safety Program (Non-structural)				Earthquake preparedness information via City website; Ch 15.11 Rehabilitation and Abatement of Existing Seismically Unsafe Buildings

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Earthquake Modernization Plan (Building Safety)				CIP projects for City buildings; Ch 15.11 Rehabilitation and Abatement of Existing Seismically Unsafe Buildings
Hazard Plans				
General Plan Safety Element				City of Napa 2040 General Plan Safety and Noise Element addresses geologic, seismic, flood, fire, hazardous materials, and climate hazards
Site Plan Review Requirements				Ch 17.62 Design Review Permits
General Plan Environmental Justice Element				No standalone element but integrated throughout 2040 General Plan; Public Health and Equity Element
Community Wildfire Protection Plan (CWPP)				2021 Napa County CWPP
Economic Development Plan				City of Napa 2040 General Plan Economic Development Element
Floodplain Management Plan				2020 HMP (to be replaced by this update); City of Napa 2040 General Plan Safety and Noise Element
Stormwater Management Plan				Stormwater and drainage management implemented by Public Works Dept, Engineering Division, and through NPDES permit; includes annual inspections and BMP enforcement
Emergency Operations Plan				EOP maintained by Fire Dept and OES
Climate Action Plan				Napa County Regional Climate Action and Adaptation Plan (RCAAP)
Climate Vulnerability Assessment				Napa County RCAAP includes assessment
Urban Greening Plan				2024 Urban Forestry Management Plan; City of Napa 2040 General Plan Natural Resources, Climate Change and Sustainability, and Community Services, Parks, and Recreation Elements
Ground Water Management Planning / Plans				Maintained by Napa County Groundwater Sustainability Agency; 2020 UWMP
National Flood Protection Program (NFIP)				
Floodplain Management Regulations				Ch 17.38 Floodplain Management Overlay District
Flood Insurance Education and Technical Assist.				City website provides insurance and preparedness information; Flood Awareness Week
Flood Insurance Study				2016 FEMA FIS 06055CV000C
Elevation Certificates				Maintained by CRS Coordinator
Flood Hazard Mapping / Re-Mapping				FEMA FIRMs, 2008-2016
Community Rating System (CRS)				Participating since 2001; Class 7
Administrative and Technical				
Community Planning and Development Services				
Community Planner				Community Development Dept, Planning Division

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Planner/Engineer (Land Development)				Public Works Dept, Development Engineering Division
Engineer/Professional (Construction)				Public Works Dept, Engineering Division
Planner/Engineer/Scientist (Natural Hazards)				Parks and Recreation Dept
Transportation Planner				Public Works Dept, Transportation Engineering Division
Resiliency Planner				No dedicated staff; shared role in Community Development Dept, Planning Division
Building Code Official (Full time or Augmented)				Community Development Dept, Building Division
Floodplain Administrator				Public Works Dept Director
Fire Marshal				Napa City Fire Department
Dedicated Public Outreach Personnel				The city has a dedicated Personnel and Media Relations Manager and an Analyst \ and various departments also have their own outreach personnel
GIS Specialist and Capability				GIS capacity in Public Works and Community Development Depts; supported by Napa County GIS
Emergency Manager				Fire Department/OES; coordination with County OES
Dedicated Grant Manager, Writer, or Specialist				Finance Dept, but no dedicated staff; shared across departments
Other	N/A	N/A	N/A	
Warning Systems/Services				
General				Alert Napa County / Everbridge Emergency Notification Service (formerly Nixle)
Flood				Alert Napa County / Everbridge Emergency Notification Service (formerly Nixle)
Tornado				Alert Napa County / Everbridge Emergency Notification Service (formerly Nixle)
Wildfire				Alert Napa County / Everbridge Emergency Notification Service (formerly Nixle)
Geological Hazards				Alert Napa County / Everbridge Emergency Notification Service (formerly Nixle)
Fiscal Capabilities				
Financial Resources for Hazard Mitigation				
Levy Taxes for Specific Purposes				Not consistently applied, but can place special tax measures on ballot for specific purposes (e.g., sales tax for public safety)
Utilities Fees				Water service fees; sewer provided by Napa Sanitation District
Benefit assessments				Not currently in use; future opportunity

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Community Development Block Grants				Received via HUD; can support hazard-related housing rehabilitation and infrastructure
System Development Fee				Impact fees collected for storm drain infrastructure, street improvement, fire and paramedic development, affordable housing, etc.
General Obligation Bonds to Incur Debt				General obligation bonds are available financing tools
Special Tax Bonds to Incur Debt				Special tax/revenue bonds are authorized for specific projects
Withheld Spending in Hazard-Prone Areas				General Plan policies restrict development in hazard-prone areas
Stormwater Service Fees				No fee collected currently
Capital Improvement Project Funding				CIP adopted; tied to annual budget
Education / Outreach Capabilities				
Education/Outreach Resources				
Website Dedicated to Hazard Topics				City website provides hazard-specific guidance and information on emergency preparedness, fire prevention, floodplain management, and climate action
Dedicated Social Media				City and Fire Department maintain active Facebook, Twitter/X, and Instagram accounts
Local Citizen Groups That Communicate Hazard Risks				Napa Valley COAD (Community Organizations Active in Disaster) and neighborhood associations
Hazard Info. Avail. at Library/ Planning Desk				Limited printed materials at City Hall and County library; hazard info mostly digital
Annual Public Safety Events				Fire Prevention Week, Flood Awareness Week, Earthquake ShakeOut, and Ready Napa County events
Ability to Field Public Tech. Assistance Requests				City departments respond to hazard-related inquiries by phone, email, or web forms; Public Works and Fire provide direct technical assistance
Public Safety Newsletters or Printed Outreach				City provides occasional newsletters and flyers; most outreach digital
Community Emergency Response Team (CERT)				City of Napa and Napa County CERTs
Fire Safe Councils				Fire Safe Council and others through Napa Communities Firesafe Foundation
Firewise				Not currently designated; firewise communities in surrounding area
StormReady				StormReady designated
Resource Conservation Districts				Napa County RCD provides outreach on wildfire, drought, and other hazard topics
Other	N/A	N/A	N/A	

3.6.2 City of Napa Mitigation Action Plan

Napa's mitigation actions were developed through a collaborative process informed by the updated risk assessment, local priorities, and extensive stakeholder engagement. As part of this 2026 MJHMP update, the city reviewed mitigation actions from its prior Local Hazard Mitigation Plan to determine which actions to carry forward, which to consolidate, and where entirely new strategies were required. This careful evaluation ensured that the updated action plan builds upon past commitments while also responding to current risks and future challenges.

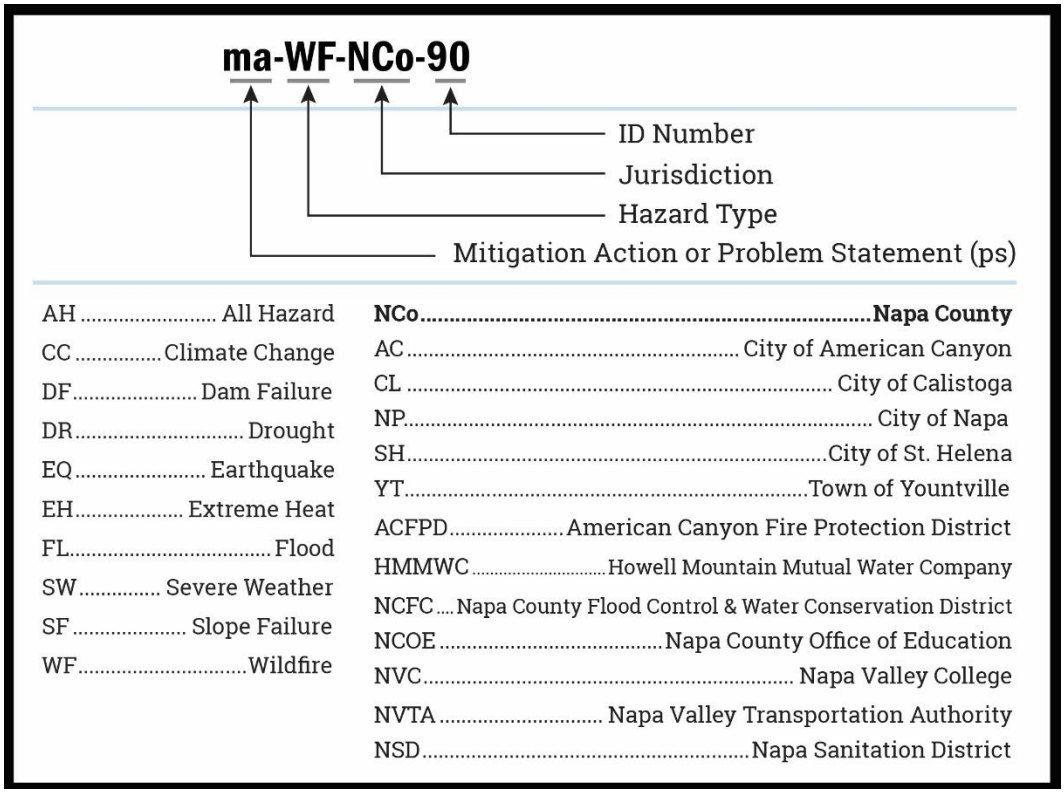


Figure 3-26: Mitigation Action Number Key

The plan addresses Napa's most significant hazards, including wildfire, dam failure, flood, earthquake, drought, severe weather, extreme heat and climate change. Each mitigation action is designed to align with FEMA' s hazard mitigation guidance and the requirements of the Disaster Mitigation Act of 2000. Where appropriate, overlapping or redundant actions were consolidated into broader, more comprehensive strategies that improve clarity, increase feasibility, and strengthen regional coordination.

The mitigation action prioritization method used by all participating jurisdictions is described in Volume 1, Section 4. Each action specific to City of Napa is documented in Table 3-18, which identifies the responsible department, implementation timeframe, potential funding sources, and resources required to complete the action. Each action is also assigned a unique alphanumeric identifier (see Figure 3-26) that links the strategy to its associated hazard and supports consistent monitoring and reporting.

Table 3-18: City of Napa Mitigation Action Plan

Mitigation No.	Hazard Type	Sub-Hazard	Mitigation Type	Year	Primary Agency	Title	Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Problem Statements
ma-AH-CN-0	All Hazard		PE&A - Public Education & Awareness , ES - Emergency Services	2015	City of Napa	Communications System Resilience	Improve and harden the City's public alerting, radio, and data systems (including back-up communications and translation capacity) to maintain connectivity during hazard and other emergency events, with a focus on reaching vulnerable populations.	Fire Department, IT Department, Police Department	High	High	3-5 Years	Project	HMGP / BRIC , EMPG	High	ps-WF-CN-13, ps-DF-CN-41, ps-DF-CN-42, ps-AH-CN-47, ps-CC-CN-4, ps-EQ-CN-6
ma-AH-CN-3	All Hazard		PE&A - Public Education & Awareness	2015	City of Napa	Unified Community Hazard Education & Preparedness Program	Consolidate and modernize all City outreach, education, and public awareness activities into a single, coordinated program that provides guidance and information on assistance resources for earthquake, wildfire, flood, severe weather, extreme heat, drought, dam failure, and climate-change-driven hazards. Activities include education campaigns, website enhancements, hazard-specific toolkits (business continuity, household retrofits, defensible space, water conservation), evacuation route and shelter messaging, and targeted outreach for vulnerable populations (seniors, mobile home parks, renters, low-income households, unhoused populations).	Fire Department	Low	Medium	1-3 Years	5%	Internal Funding , N/A	High	ps-EQ-CN-10, ps-CC-CN-1, ps-EH-CN-2, ps-CC-CN-3, ps-DR-CN-31, ps-FL-CN-26, ps-FL-CN-27, ps-CC-CN-4, ps-CC-CN-19, ps-DF-CN-43, ps-DR-CN-33, ps-EQ-CN-7, ps-FL-CN-22, ps-SW-CN-34, ps-WF-CN-12
ma-AH-CN-7	All Hazard		PE&A - Public Education & Awareness , ES - Emergency Services	2015	City of Napa	Expanded & Improved Shelter Network	In collaboration with the County and other municipalities, expand and improve the shelter network with ADA-compliant facilities, adequate air filtration and cooling equipment, back-up power, options for pets, and transportation strategies for vulnerable populations during extreme heat, prolonged smoke, and other hazard events, with a focus on seniors, households without AC, and people experiencing homelessness.	Economic Development Dept	High	Medium	Ongoing	Project	HMGP / BRIC , EMPG , Internal Funding	Medium	ps-FL-CN-27, ps-WF-CN-12, ps-EH-CN-2, ps-EH-CN-17, ps-FL-CN-22, ps-DF-CN-43, ps-CC-CN-4
ma-AH-CN-8	All Hazard		PRV - Prevention	2015	City of Napa	Enhanced Pre- & Post-Disaster Coordination	Establish the position of Emergency Manager and, in coordination with County Planning, Building, and OES, improve procedures for assessing damage after a disaster event, including inspecting and tagging structures for public occupancy and ensuring compliance with NFIP requirements.	Building / Economic Development Dept	Low	Medium	1-3 Years	Capacity / Capability Building	EMPG , Internal Funding	Medium	ps-EQ-CN-8, ps-DF-CN-44, ps-AH-CN-47, ps-CC-CN-4, ps-DF-CN-41, ps-EQ-CN-5, ps-FL-CN-20, ps-SW-CN-39, ps-WF-CN-14
ma-DF-CN-52	Dam Failure		PRV - Prevention , ES - Emergency Services	2021	City of Napa	Dam Failure Planning & Coordination	Integrate dam-failure risk and response into the City and County EOP, clarify roles and evacuation priorities, and improve coordination with critical facility operators in mapped dam inundation areas.	Fire Department	Low	Medium	1-3 Years	Capacity / Capability Building	CDBG DRI , EMPG , Internal Funding	High	ps-DF-CN-41, ps-DF-CN-42, ps-DF-CN-43, ps-DF-CN-44
ma-DR-CN-16	Drought		SP - Structural Projects	2015	City of Napa	Drought-Resilient Water Supply	Strengthen long-term water supply reliability through diversified supply, storage optimization, interties, and operational changes that account for more frequent and severe drought. Incorporate recommendations from the Napa Valley Drought Contingency Plan and update the Urban Water Management Plan to reflect supply resilience improvements.	Utilities Department	High	High	5-10 Years	Project	HMGP / BRIC , Internal Funding	High	ps-EH-CN-0, ps-DR-CN-29, ps-DR-CN-32, ps-DR-CN-31, ps-DR-CN-33, ps-CC-CN-4

Mitigation No.	Hazard Type	Sub-Hazard	Mitigation Type	Year	Primary Agency	Title	Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Problem Statements
ma-EQ-CN-18	Earthquake		PPRO - Property Protection , PE&A - Public Education & Awareness	2015	City of Napa	Seismic Safety Support Program	Review feasibility of and consider the development of a program to encourage the retrofit seismically vulnerable public and private structures, including historic downtown buildings, multi-family housing, mobile home parks, schools, and community facilities.	Community Development Department	High	High	3-5 Years	Capacity / Capability Building	HMGP / BRIC	Medium	ps-EQ-CN-5, ps-EQ-CN-5, ps-EQ-CN-7
ma-EQ-CN-20	Earthquake		SP - Structural Projects	2015	City of Napa	Lifeline Infrastructure Seismic Hardening	Upgrade water, wastewater, and critical electric infrastructure to withstand major earthquakes, including fault-crossing pipeline replacements, flexible joints, valve and pump redundancy, and backup power at key nodes.	Utilities Department	High	High	3-5 Years	Project	HMGP / BRIC	Medium	ps-EQ-CN-6, ps-EQ-CN-5
ma-FL-CN-23	Flood		PRV - Prevention , SP - Structural Projects	2015	City of Napa	Napa River Flood Project & Residual Risk Reduction	In cooperation with NCFCWCD, complete remaining phases of the Measure A Napa River Flood Project and implement complementary projects (pump stations, detention, localized drainage improvements) to protect critical facilities and neighborhoods that remain at risk of flood hazards.	Community Development Department, Utilities Department	High	High	Ongoing	Project	HMGP / BRIC , FMA	High	ps-FL-CN-20, ps-FL-CN-21, ps-FL-CN-22, ps-CC-CN-19, ps-FL-CN-28, ps-FL-CN-23
ma-FL-CN-28	Flood		PRV - Prevention , PE&A - Public Education & Awareness	2015	City of Napa	Flood Mapping & Risk Communication Updates	In collaboration with the County and FCWCD, update flood hazard mapping to incorporate completed projects, sea-level rise, atmospheric river events, and tidal influences, and improve flood warning systems with enhanced stream sensor coverage and free NOAA weather radios to high risk, limited income households in flood zones.	County Public Works, City Utilities Department	Medium	Medium	1-3 Years	Project	HMGP / BRIC , FMA , Internal Funding	Medium	ps-CC-CN-19, ps-FL-CN-23, ps-FL-CN-22, ps-FL-CN-20, ps-CC-CN-4
ma-SW-CN-24	Severe Weather	Heavy Rain	NRP - Natural Resource Protection , SP - Structural Projects	2015	City of Napa	Drainage Improvement Projects	Implement targeted drainage infrastructure upgrades at localized flooding hotspots (e.g., Trower, Valencia, Yosemite, Diablo, Glacier) to reduce street flooding and hazardous travel conditions during heavy rain events, including nature-based improvements.	Community Development Department, Utilities Department, Public Works Department	High	High	3-5 Years	Project	HMGP / BRIC , FMA	High	ps-FL-CN-20, ps-FL-CN-21, ps-CC-CN-19, ps-FL-CN-28, ps-SW-CN-34, ps-SW-CN-35, ps-CC-CN-4
ma-SW-CN-58	Severe Weather	High Wind	NRP - Natural Resource Protection , ES - Emergency Services	2021	City of Napa	Urban Forest & Windstorm Risk Reduction Program	Implement proactive tree risk assessments, pruning, removals, and replanting with appropriate species that do not interfere with utilities along major corridors and evacuation routes to reduce outages, blocked roads, and damage during high-wind events.	Administration, Public Works Department, Parks and Recreation Department	Medium	High	3-5 Years	Capacity / Capability Building	HMGP / BRIC	Medium	ps-SW-CN-35, ps-SW-CN-39, ps-SW-CN-36, ps-CC-CN-4
ma-WF-CN-41	Wildfire		NRP - Natural Resource Protection	2015	City of Napa	Fuel Management Projects & Maintenance Program	Establish a program to ensure ongoing maintenance of key treatment areas and conduct new fuel management projects in City parks and open spaces (e.g., Westwood Hills and Alston).	Fire Department	Medium	High	1-3 Years	Capacity / Capability Building	HMGP / BRIC , AFG	Medium	ps-WF-CN-12, ps-CC-CN-18, ps-WF-CN-14, ps-WF-CN-11, ps-CC-CN-4
ma-WF-CN-43	Wildfire		NRP - Natural Resource Protection , SP - Structural Projects	2015	City of Napa	Water Resources Protections	Implement coordinated fuels management, access improvements, and structural hardening projects to protect water sources, watersheds, and treatment and conveyance systems from wildfire and post-fire impacts (debris flows, erosion). Coordinate protection efforts within the Lake Hennessey and Lake Milliken watersheds to protect drinking water supplies from water quality impacts.	Utilities Department	High	High	3-5 Years	Project	HMGP / BRIC , AFG	High	ps-WF-CN-11, ps-WF-CN-16, ps-WF-CN-12, ps-WF-CN-14, ps-CC-CN-4

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3.6.3 Status of Previous Mitigation Actions

In 2020, the City of Napa adopted its previous FEMA-approved HMP. This 2026 MJHMP represents a comprehensive update from that previous plan, as discussed in Volume 1, Section 1.5. Table 3-19 provides status updates for all of the previous mitigation actions in the City of Napa HMP, from which many of the mitigation actions in Table 3-18 were sourced and revised.

Table 3-19: City of Napa Status of Previous Mitigation Actions

Mitigation No.	Hazard Type	Status	Year	Primary Agency	Title/Description	Reason Completed/ Cancelled
ma-AH-CN-0	All Hazard	Ongoing	2015	City of Napa	Communications System Resilience	Revised
ma-AH-CN-3	All Hazard	Ongoing	2015	City of Napa	Unified Community Hazard Education & Preparedness Program	Revised
ma-AH-CN-7	All Hazard	Ongoing	2015	City of Napa	Expanded & Improved Shelter Network	Revised
ma-AH-CN-8	All Hazard	Ongoing	2015	City of Napa	Enhanced Pre- & Post-Disaster Coordination	Revised
ma-DF-CN-52	Dam Failure	Ongoing	2021	City of Napa	Dam Failure Planning & Coordination	Revised
ma-DR-CN-16	Drought	Ongoing	2015	City of Napa	Drought-Resilient Water Supply	Revised
ma-EQ-CN-18	Earthquake	Ongoing	2015	City of Napa	Seismic Safety Support Program	Revised
ma-EQ-CN-20	Earthquake	Ongoing	2015	City of Napa	Lifeline Infrastructure Seismic Hardening	Revised
ma-FL-CN-23	Flood	Ongoing	2015	City of Napa	Napa River Flood Project & Residual Risk Reduction	Revised
ma-FL-CN-28	Flood	Ongoing	2015	City of Napa	Flood Mapping & Risk Communication Updates	Revised
ma-FL-CN-24	Flood	Ongoing	2015	City of Napa	Drainage Improvement Projects	Revised
ma-EW-CN-58	Severe Weather	Ongoing	2021	City of Napa	Urban Forest & Windstorm Risk Reduction Program	Revised
ma-WF-CN-41	Wildfire	Ongoing	2015	City of Napa	Fuel Management Projects & Maintenance Program	Revised
ma-WF-CN-43	Wildfire	Ongoing	2015	City of Napa	Water Resources Protections	Revised
ma-AH-CN-1	All Hazard	Completed	2015	City of Napa	Build an alternate EOC	Back-up EOC established at Las Flores Community Center
ma-AH-CN-2	All Hazard	Completed	2015	City of Napa	Create a Remote Workers Infrastructure	Remote access established
ma-AH-CN-4	All Hazard	Completed	2015	City of Napa	Maintain and equip an Emergency Operation Center(EOC) for immediate availability in the event of a disaster.	Back-up power installed and back-up EOC established at Las Flores Community Center

Mitigation No.	Hazard Type	Status	Year	Primary Agency	Title/Description	Reason Completed/ Cancelled
ma-AH-CN-57	All Hazard	Completed	2021	City of Napa	Construct backup generators at critical facilities (fire stations, hospital) and sheltering locations to respond to hazard events in loss of power.	Permanent back-up power in place for key facilities
ma-AH-CN-5	All Hazard	Cancelled	2015	City of Napa	Work with local businesses to prepare Emergency Preparedness Plans by working with other agencies and advocacy organizations to distribute to and assist businesses with the preparation of plans in the case of disaster.	ma-AH-CN-3, ma-AH-CN-5, ma-AH-CN-7, ma-FL-CN-25, ma-FL-CN-29, ma-FL-CN-30, ma-DR-CN-54, ma-EQ-CN-17, ma-WF-CN-42, ma-WF-CN-44, ma-WF-CN-45, ma-PN-CN-31, ma-PN-CN-32 & ma-AH-CN-13 combined and revised
ma-AH-CN-6	All Hazard	Cancelled	2015	City of Napa	Identify and develop programs to be instituted to assist residents to prepare for and recover from a disaster	Ongoing work of the City; also included within MA-AH-CN-3
ma-AH-CN-9	All Hazard	Cancelled	2015	City of Napa	Establish the position of Disaster Coordinator for the City of Napa	ma-AH-CN-8, 9 & 13 Revised
ma-AH-CN-10	All Hazard	Cancelled	2015	City of Napa	Identify critical businesses and prepare emergency response plans to protect against economic loss and speedy recovery	Included within MA-AH-CN-6
ma-AH-CN-11	All Hazard	Cancelled	2015	City of Napa	Develop inventories of specific types of businesses and buildings and prepare procedures for post-disaster recovery efforts	This action is included in ma-AH-CN-8.
ma-AH-CN-12	All Hazard	Cancelled	2015	City of Napa	Prepare a secondary EOC site	Included within MA-AH-CN-1
ma-AH-CN-13	All Hazard	Cancelled	2015	City of Napa	Develop a program to identify evacuation routes and procedures for all sensitive facilities and implement programs to practice evacuation and safety maneuvers.	ma-AH-CN-3, ma-AH-CN-5, ma-AH-CN-7, ma-FL-CN-25, ma-FL-CN-29, ma-FL-CN-30, ma-DR-CN-54, ma-EQ-CN-17, ma-WF-CN-42, ma-WF-CN-44, ma-WF-CN-45, ma-PN-CN-31, ma-PN-CN-32 & ma-AH-CN-13 combined and revised
ma-CC-CN-51	All Hazard	Cancelled	2021	City of Napa	Expanded & Improved Shelter Network	ma-AH-CN-7, ma-CC-CN-51 combined and revised
ma-CC-CN-14	Climate Change	Cancelled	2015	City of Napa	Develop a Climate Action Plan applicable with state and federal law	Addressed in Napa County Regional Climate Action and Adaptation Plan
ma-DF-CN-15	Dam Failure	Cancelled	2015	City of Napa	Maintain a program on dam safety and continue to cooperate with the State Division of Dam Safety in addressing any needed dam maintenance or structural improvements.	Ongoing baseline mitigation activity

Mitigation No.	Hazard Type	Status	Year	Primary Agency	Title/Description	Reason Completed/ Cancelled
ma-DR-CN-54	Drought	Cancelled	2021	City of Napa	Develop a public education campaign to encourage water conservation during drought, in collaboration with the Napa Valley Drought Contingency Plan Task Force and Napa Sanitation District. The intent is to avoid or delay issuance of water restriction emergency declarations.	ma-AH-CN-3, ma-AH-CN-5, ma-AH-CN-7, ma-FL-CN-25, ma-FL-CN-29, ma-FL-CN-30, ma-DR-CN-54, ma-EQ-CN-17, ma-WF-CN-42, ma-WF-CN-44, ma-WF-CN-45, ma-PN-CN-31, ma-PN-CN-32 & ma-AH-CN-13 combined and revised
ma-DR-CN-55	Drought	Cancelled	2021	City of Napa	Implement recommendations from the Napa Valley Drought Contingency Plan. Incorporate into the City's Urban Water Management Plan.	ma-DR-CN-16 & 55 Revised
ma-EQ-CN-17	Earthquake	Cancelled	2015	City of Napa	Develop a program to educate the community on the various methods of retrofitting pre-earthquake code designed structures, which would include: workshops, literature and public safety announcements.	ma-AH-CN-3, ma-AH-CN-5, ma-AH-CN-7, ma-FL-CN-25, ma-FL-CN-29, ma-FL-CN-30, ma-DR-CN-54, ma-EQ-CN-17, ma-WF-CN-42, ma-WF-CN-44, ma-WF-CN-45, ma-PN-CN-31, ma-PN-CN-32 & ma-AH-CN-13 combined and revised
ma-EQ-CN-19	Earthquake	Cancelled	2015	City of Napa	Building Earthquake Safety Program	Included within MA-EW-CN-17
ma-EQ-CN-21	Earthquake	Cancelled	2015	City of Napa	Invest in automation and control features on AC transmission pipeline to protect against catastrophic failures.	Included within MA-EW-CN-20
ma-EQ-CN-22	Earthquake	Cancelled	2015	City of Napa	Invest in water transmission pipeline rehabilitation/replacement to protect against catastrophic failures	Included within MA-EW-CN-20
ma-EQ-CN-56	Earthquake	Cancelled	2021	City of Napa	Encourage privately owned unreinforced masonry buildings and critical facilities (e.g. churches, hotels, other gathering facilities) to evaluate the ability of the buildings to withstand earthquakes and to address any deficiencies identified; explore a cost-share program to assist private owners in conducting seismic retrofits.	ma-EQ-CN-17, 18 & 56 Revised
ma-EW-CN-59	Extreme Weather	Cancelled	2021	City of Napa	Replace dying or dead evergreen vegetation with wind resistant vegetation and implement annual tree trimming program.	ma-EW-CN-58 & 59 combined and revised
ma-FL-CN-25	Flood	Cancelled	2015	City of Napa	Improve Countywide flood surveillance/early warning system	ma-AH-CN-3, ma-AH-CN-5, ma-AH-CN-7, ma-FL-CN-25, ma-FL-CN-29, ma-FL-CN-30, ma-DR-CN-54, ma-EQ-CN-17, ma-WF-CN-42, ma-WF-CN-44, ma-WF-CN-45, ma-PN-CN-31, ma-PN-CN-32 & ma-AH-CN-13 combined and revised

Mitigation No.	Hazard Type	Status	Year	Primary Agency	Title/Description	Reason Completed/ Cancelled
ma-FL-CN-26	Flood	Cancelled	2015	City of Napa	Complete Soscol Interior Drainage Project Preliminary Design	ma-FL-CN-24 & 26 combined and revised
ma-FL-CN-27	Flood	Cancelled	2015	City of Napa	Continue to apply floodplain management regulations for development in the flood plain and floodway.	Baseline mitigation requirement
ma-FL-CN-29	Flood	Cancelled	2015	City of Napa	Distribute NOAA weather Radios to high risk, limited income families living in flood zones. Develop program of at cost NOAA radios for families in the various flood zones in Napa County. Provide weather radios to block captains.	ma-AH-CN-3, ma-AH-CN-5, ma-AH-CN-7, ma-FL-CN-25, ma-FL-CN-29, ma-FL-CN-30, ma-DR-CN-54, ma-EQ-CN-17, ma-WF-CN-42, ma-WF-CN-44, ma-WF-CN-45, ma-PN-CN-31, ma-PN-CN-32 & ma-AH-CN-13 combined and revised
ma-FL-CN-30	Flood	Cancelled	2015	City of Napa	Periodically update the Flood Insurance Rate Maps to reflect the improvements that have been completed as part of the Flood Protection Project.	ma-AH-CN-3, ma-AH-CN-5, ma-AH-CN-7, ma-FL-CN-25, ma-FL-CN-29, ma-FL-CN-30, ma-DR-CN-54, ma-EQ-CN-17, ma-WF-CN-42, ma-WF-CN-44, ma-WF-CN-45, ma-PN-CN-31, ma-PN-CN-32 & ma-AH-CN-13 combined and revised
ma-FL-CN-49	Flood	Cancelled	2021	City of Napa	Implement various flood control projects after approved Flood Control Project. For example, additional pump stations are needed to increase the functionality and resilience of the flood wall along the west side of the Napa River.	ma-FL-CN-23, 49 & 62 combined and revised
ma-FL-CN-62	Flood	Cancelled	2021	City of Napa	Implement the Trower Avenue Storm Drain Improvements, Phase II project, which consists of improvements to alleviate flooding from heavy rain events along Valencia Street, Yosemite Street, Diablo Street and Glacier Drive.	ma-FL-CN-23, 49 & 62 combined and revised
ma-PN-CN-31	Pandemic	Cancelled	2015	City of Napa	Coordinate efforts with health community to respond to communicable diseases	Not profiled; ma-AH-CN-3, ma-AH-CN-5, ma-AH-CN-7, ma-FL-CN-25, ma-FL-CN-29, ma-FL-CN-30, ma-DR-CN-54, ma-EQ-CN-17, ma-WF-CN-42, ma-WF-CN-44, ma-WF-CN-45, ma-PN-CN-31, ma-PN-CN-32 & ma-AH-CN-13 combined and revised
ma-PN-CN-32	Pandemic	Cancelled	2015	City of Napa	Ensure that the city, the hospitals and the County Health Dept. coordinate efforts to educate, prepare for and respond to outbreaks of communicable disease	Not profiled; ma-AH-CN-3, ma-AH-CN-5, ma-AH-CN-7, ma-FL-CN-25, ma-FL-CN-29, ma-FL-CN-30, ma-DR-CN-54, ma-EQ-CN-17, ma-WF-CN-42, ma-WF-CN-44, ma-WF-CN-45, ma-PN-CN-31, ma-PN-CN-32 & ma-AH-CN-13 combined and revised

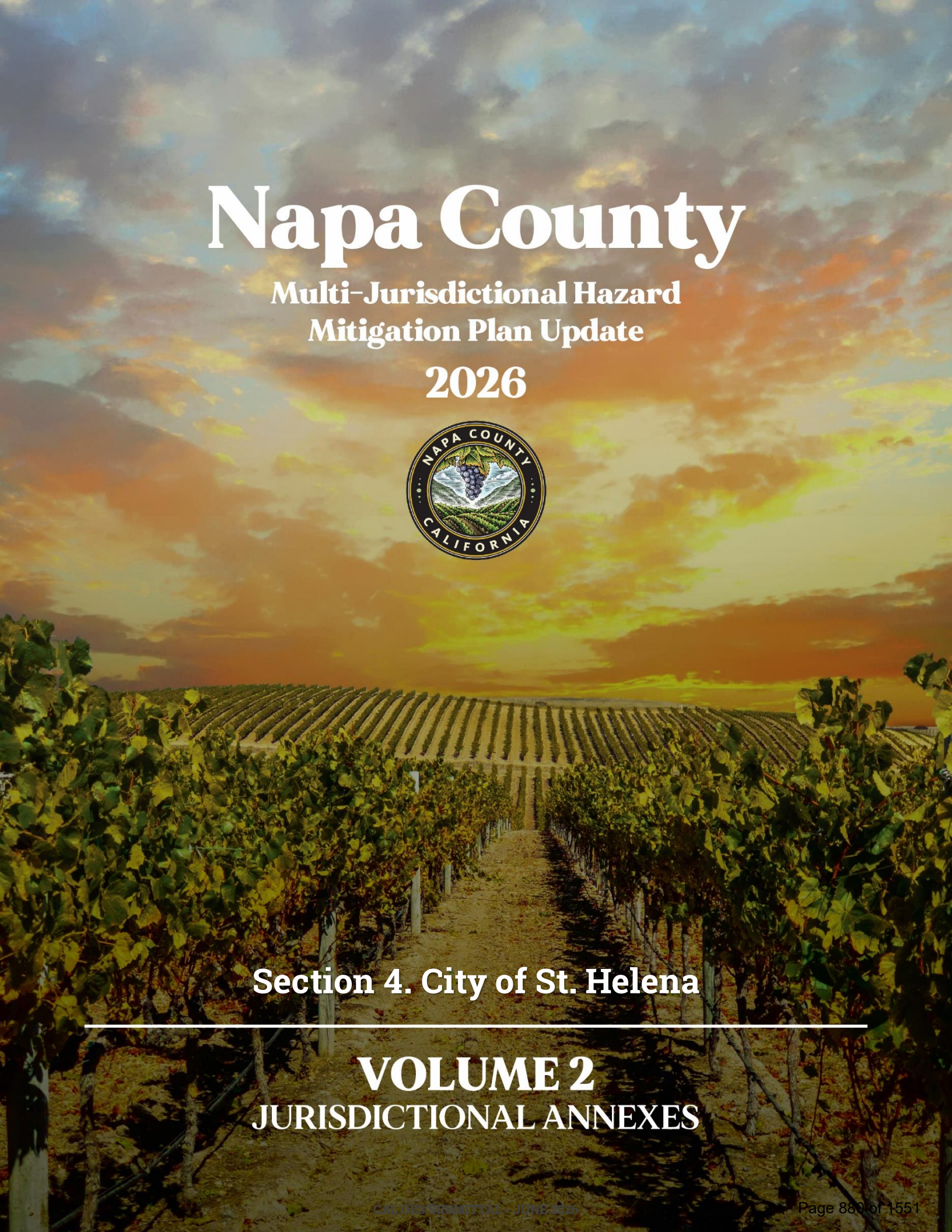
Mitigation No.	Hazard Type	Status	Year	Primary Agency	Title/Description	Reason Completed/ Cancelled
ma-PN-CN-60	Pandemic	Cancelled	2021	City of Napa	Assess and institute necessary upgrades to critical facilities to allow for usage during pandemic, including adequate ventilation and physical barriers	Not profiled
ma-TR-CN-33	Terrorism	Cancelled	2015	City of Napa	Provide training for Public Safety personnel regarding terrorism	Human-caused hazards not prioritized in this HMP; better addressed in other plans
ma-TR-CN-34	Terrorism	Cancelled	2015	City of Napa	Develop training to improve response to civil unrest and riots	Human-caused hazards not prioritized in this HMP; better addressed in other plans
ma-TR-CN-35	Terrorism	Cancelled	2015	City of Napa	Provide terrorism training	Human-caused hazards not prioritized in this HMP; better addressed in other plans
ma-TR-CN-36	Terrorism	Cancelled	2015	City of Napa	Improve response to Mass Casualty/WMD incidents	Human-caused hazards not prioritized in this HMP; better addressed in other plans
ma-TR-CN-37	Terrorism	Cancelled	2015	City of Napa	Increase agency coordination in dealing with terrorism	Human-caused hazards not prioritized in this HMP; better addressed in other plans
ma-TR-CN-38	Terrorism	Cancelled	2015	City of Napa	Modify and increase resources to decrease crime	Human-caused hazards not prioritized in this HMP; better addressed in other plans
ma-TR-CN-39	Terrorism	Cancelled	2015	City of Napa	Purchase an armored citizen rescue vehicle	Human-caused hazards not prioritized in this HMP; better addressed in other plans
ma-TR-CN-40	Terrorism	Cancelled	2015	City of Napa	Improve support of Napa County Hazardous Device Team	Human-caused hazards not prioritized in this HMP; better addressed in other plans
ma-WF-CN-42	Wildfire	Cancelled	2015	City of Napa	Continue to support the Napa Communities Firewise Foundation in the development of Fire Safe Councils and implementation of the 2021 Community Wildfire Protection Plan	ma-AH-CN-3, ma-AH-CN-5, ma-AH-CN-7, ma-FL-CN-25, ma-FL-CN-29, ma-FL-CN-30, ma-DR-CN-54, ma-EQ-CN-17, ma-WF-CN-42, ma-WF-CN-44, ma-WF-CN-45, ma-PN-CN-31, ma-PN-CN-32 & ma-AH-CN-13 combined and revised
ma-WF-CN-44	Wildfire	Cancelled	2015	City of Napa	Ensure the Fire Department reviews all building plans in WUI areas for defensible space, emergency vehicle access, fire flow and ignition resistant construction requirements.	ma-AH-CN-3, ma-AH-CN-5, ma-AH-CN-7, ma-FL-CN-25, ma-FL-CN-29, ma-FL-CN-30, ma-DR-CN-54, ma-EQ-CN-17, ma-WF-CN-42, ma-WF-CN-44, ma-WF-CN-45, ma-PN-CN-31, ma-PN-CN-32 & ma-AH-CN-13 combined and revised
ma-WF-CN-45	Wildfire	Cancelled	2015	City of Napa	Provide an ongoing vegetation management program such as the City's Weed Abatement ordinance to prohibit the spread of wildfire in ground and aerial fuels and to assist homeowners in developing defensible space.	ma-AH-CN-3, ma-AH-CN-5, ma-AH-CN-7, ma-FL-CN-25, ma-FL-CN-29, ma-FL-CN-30, ma-DR-CN-54, ma-EQ-CN-17, ma-WF-CN-42, ma-WF-CN-44, ma-WF-CN-45, ma-PN-CN-31, ma-PN-CN-32 & ma-AH-CN-13 combined and revised

Mitigation No.	Hazard Type	Status	Year	Primary Agency	Title/Description	Reason Completed/ Cancelled
ma-WF-CN-46	Wildfire	Cancelled	2021	City of Napa	Coordinate watershed protection efforts within the Lake Hennessey and Lake Milliken watersheds to protect drinking water supplies from water quality impacts.	ma-WF-CN-43, 46, 47, 48 & 63 combined and revised
ma-WF-CN-47	Wildfire	Cancelled	2021	City of Napa	Implement Lake Hennessy Intake Pump Station Defensible Space /Construction Upgrade	ma-WF-CN-43, 46, 47, 48 & 63 combined and revised
ma-WF-CN-48	Wildfire	Cancelled	2021	City of Napa	Implement Lake Hennessy Pipeline Protection Project	ma-WF-CN-43, 46, 47, 48 & 63 combined and revised
ma-WF-CN-50	Wildfire	Cancelled	2021	City of Napa	Implement demonstration fuels treatment and emergency access project at Timberhill Park	ma-WF-CN-41, 42, 45, 50 & 61 combined and revised
ma-WF-CN-61	Wildfire	Cancelled	2021	City of Napa	Maintain Fire Access Roads and evacuation routes that have been identified throughout the City of Napa.	ma-WF-CN-41, 42, 45, 50 & 61 combined and revised
ma-WF-CN-63	Wildfire	Cancelled	2021	City of Napa	Fund and implement the Milliken Raw Water Pipeline Hardening Project	ma-WF-CN-43, 46, 47, 48 & 63 combined and revised

Napa County

Multi-Jurisdictional Hazard Mitigation Plan Update

2026



Section 4. City of St. Helena

VOLUME 2
JURISDICTIONAL ANNEXES

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Napa County

2026 Multi-Jurisdictional Hazard Mitigation Plan Update

City of St. Helena (SH)

Municipal Annex

Section 4. City of St. Helena 4-9

4.1 Scope & Purpose 4-9

4.2 Jurisdictional Setting 4-9

4.2.1 Geography & Climate 4-10

4.2.2 Demographics & Vulnerable Populations 4-12

4.2.3 Economy 4-28

4.2.4 Growth Trends & Future Development 4-28

4.3 Planning Process 4-29

4.3.1 Public Input & Draft Review 4-32

4.4 What's New 4-32

4.4.1 Mitigation Activities 4-32

4.4.2 Mitigation Successes 4-33

4.5 Risk Assessment 4-34

4.5.1 Hazard Screening & Prioritization 4-35

4.5.2 Vulnerability to Specific Hazards 4-39

4.5.3 Climate Change Impacts & Vulnerable Populations 4-61

4.5.4 Hazard Problem Statements 4-62

4.6 Mitigation Strategy 4-65

4.6.1 Capabilities & Opportunities 4-66

4.6.2 City of St. Helena Mitigation Action 4-79

4.6.3 Status of Previous Mitigation Actions 4-84

List of Figures

Figure 4-1: City of St. Helena Geographic Overview Map 4-11
Figure 4-2: City of St. Helena Median Household Income Map 4-15
Figure 4-3: City of St. Helena Poverty Status Map 4-16
Figure 4-4: City of St. Helena Housing Occupancy Map 4-17
Figure 4-5: City of St. Helena Dependent Age Groups Map 4-21
Figure 4-6: City of St. Helena Disabled Elderly Map 4-22
Figure 4-7: City of St. Helena Race and Ethnicity Map 4-24
Figure 4-8: City of St. Helena Spanish-Speaking Households Map 4-25
Figure 4-9: City of St. Helena CDC Social Vulnerability Index Map 4-27
Figure 4-10: City of St. Helena Risk Assessment Matrix 4-37
Figure 4-11: Exposure Summary – City of St. Helena Wildfire Risk 4-41
Figure 4-12: Exposure Summary – City of St. Helena Earthquake Risk (M7.1 Hunting Creek–Berryessa) 4-44
Figure 4-13: Exposure Summary – City of St. Helena Earthquake Risk (M6.7 West Napa) 4-45
Figure 4-14: Exposure Summary – City of St. Helena Liquefaction Risk 4-46
Figure 4-15: City of St. Helena Flood Risk (FEMA Zones and DWR Awareness Zone) 4-49
Figure 4-16: Exposure Summary – City of St. Helena Flood Risk (FEMA Zones) 4-50
Figure 4-17: Exposure Summary – City of St. Helena Slope Failure Risk 4-52
Figure 4-18: Drought Severity Timeline 2000-2024 4-55
Figure 4-19: Exposure Summary – City of St. Helena Dam Inundation Zone 4-57
Figure 4-20: Mitigation Action Number Key 4-79

List of Tables

Table 4-1: City of St. Helena Population and Households 4-12
Table 4-2: City of St. Helena Income and Poverty 4-13
Table 4-3: City of St. Helena Renter- and Owner-Occupied Housing 4-14
Table 4-4: City of St. Helena Households with Seniors 4-18
Table 4-5: City of St. Helena Households with Children 4-19
Table 4-6: City of St. Helena Population with Disabilities and Access to Transportation 4-20
Table 4-7: City of St. Helena Household Languages 4-23
Table 4-8: City of St. Helena Planning Team and Steering Group Members 4-30
Table 4-9: City of St. Helena Planning Team Meetings 4-31
Table 4-10: City of St. Helena Document Review of Potential Hazards 4-36
Table 4-11: City of St. Helena Hazards Prioritization Summary 4-38
Table 4-12: City of St. Helena National Flood Insurance Program Information 4-48
Table 4-13: Drought Classifications and Impacts 4-54
Table 4-14: Cal-Adapt Extreme Heat Thresholds 4-59
Table 4-15: City of St. Helena Hazard Problem Statements 4-62
Table 4-16: City of St. Helena Capabilities and Opportunities Assessment 4-74
Table 4-17: City of St. Helena Mitigation Action Plan 4-82
Table 4-18: City of St. Helena Status of Previous Mitigation Actions 4-84

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Adoption Resolution

To comply with the Federal Disaster Mitigation Act of 2000 (DMA 2000), the St. Helena City Council has officially adopted this 2026 Napa County Multi-Jurisdictional Hazard Mitigation Plan, including Volume 1 in its entirety as well as this Volume 2 municipal annex. The adoption of the MJHMP recognizes the city's commitment to reducing the impacts of natural hazards within its jurisdiction and across Napa County.

A copy of the city's adoption record is provided on the following pages. Adoption records for all jurisdictions are summarized in Volume 1, Table ES-1.

ADOPTION RECORD TO BE INSERTED UPON COMPLETION.

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Section 4. City of St. Helena

4.1 Scope & Purpose

This Jurisdictional Annex for the City of St. Helena of the 2026 Napa County Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) details the hazard mitigation planning elements specific to the city's planning area. The annex is not intended to be a standalone document but appends to and supplements the information contained in the umbrella plan document (Volume 1). As such, all sections of the umbrella plan, including the planning process and other procedural requirements, apply to and were met by the City of St. Helena. This annex provides additional information specific to the city, with a focus on hazard identification and risk assessment, vulnerability assessment, problem statements, mitigation strategy, and capabilities assessment. Below are the City of St. Helena Points of Contact:

Primary Point of Contact	Alternate Point of Contact
City Manager City of St. Helena 1088 College Avenue St. Helena, CA 94574 Telephone: (707) 968-2744 ext. 500 email: citymanager@cityofsthelena.org	John Sorensen, Fire Chief City of St. Helena 1088 College Avenue St. Helena, CA 94574 Telephone: (707) 486-2882 email: chief170@cityofsthelena.org

4.2 Jurisdictional Setting

The City of St. Helena sits at the heart of the upper Napa Valley in Napa County in Northern California, approximately 50 miles north of San Francisco. The city is bounded by the Mayacamas Mountains to the west, the Napa Valley to the south and north, and the Howell Mountains to the east. The city is situated along Highways 29 and 128, which provide regional access to other parts of Napa County, as well as Sonoma and Lake Counties. St. Helena is a small town characterized by a mix of residential neighborhoods, a Central Business District, resorts and other visitor-serving commercial business, and wine production facilities.

The St. Helena city limits encompass approximately 4.7 square miles on the Napa Valley floor and are bisected by the Napa River. This varied topography and proximity to a major waterway influences the city's exposure to natural hazards, including flooding, seismic shaking, wildfire along the wildland–urban interface, and climate change–related impacts such as extreme heat and increased flood risk.

The city operates as a general law city under a council-manager form of government and provides a full range of municipal services, including fire protection, police protection, public works, community development, and water and wastewater services.

In addition to its incorporated boundaries, the city provides water and wastewater services to areas outside the city limits. Under California planning law, these extraterritorial service areas are considered part of the city's planning area because damage to infrastructure beyond municipal boundaries can directly affect

public health, safety, and continuity of essential services within St. Helena. The City of St. Helena's location within Napa County is shown in Figure 4-1.

- **Year of Incorporation:** 1876
- **2021 Population:** 5,426 (US Census Bureau, 2021)
- **Population Growth:** Slow population growth from founding to 1970s; Moderate population growth since.

4.2.1 Geography & Climate

The City of St. Helena is located in the upper Napa Valley at the base of the Mayacamas Mountains. The city is bisected by the Napa River. Figure 4-1 provides a geographic overview of the city. Hydrologically, St. Helena is part of the Napa River watershed, which conveys runoff from northern Napa County through the City before discharging into San Pablo Bay. Portions of the City lie near or within historic floodplain areas, particularly adjacent to the Napa River. These low-lying areas are subject to flooding. Stormwater systems throughout the City are designed to manage runoff generated by seasonal precipitation.

The climate in St. Helena and the Napa Valley is warmer than that in the rest of the Bay Area. Nevertheless, in summer, St. Helena and the rest of the Napa Valley are protected from the hot weather of the Central Valley of California by the coastal mountain ranges. The Pacific Ocean provides a source of cool, moist air in the summer, and this steady flow of marine air holds temperatures at a moderate level. The greatest variation in temperature occurs in summer. In St. Helena, average high summer temperatures are in the upper 80's to the mid 90's. Winters are generally mild, but there are occasional cold spells. Average high winter temperatures are in the high 50's to low 60's, while the minimum temperatures are in the upper 20's and 30's. Frost is common during clear, calm mornings in the late fall and winter.

The growing season, which is the period between the last freezing temperature event in spring and the first in fall, ranges from 215 to 260 days in St. Helena. Most of the annual precipitation falls during the period of November through April. The greatest amount of rainfall is expected to range from 0.9 inch in one hour once in two years to 2.1 inches in one hour once in 100 years.

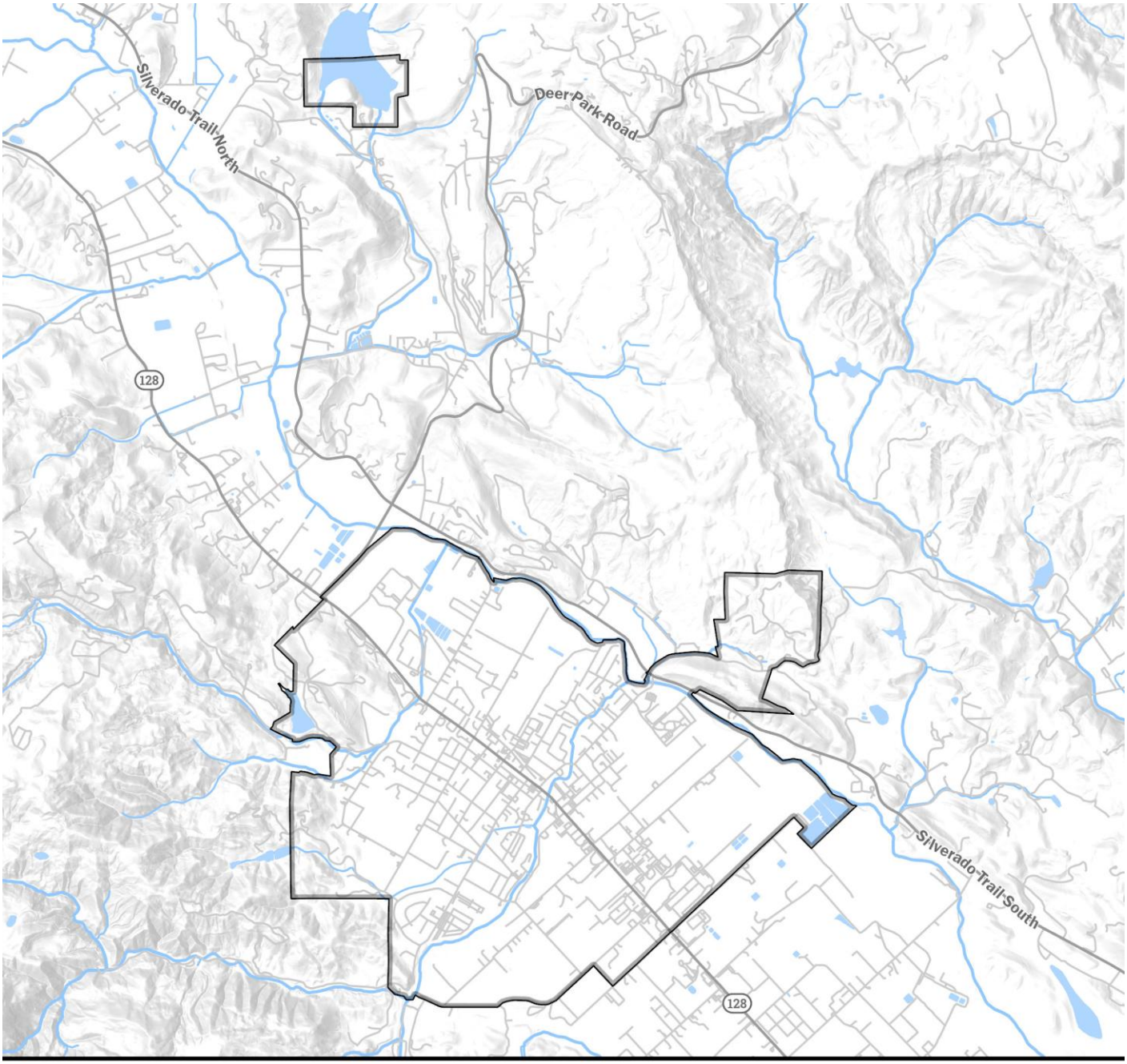


Figure 4-1: City of St. Helena Geographic Overview Map

4.2.2 Demographics & Vulnerable Populations

This section describes the demographic characteristics of the City of St. Helena to guide hazard mitigation planning efforts. Natural disasters affect communities both physically and socially, with demographic composition playing a central role in determining how impacts are distributed, particularly among vulnerable groups facing greater challenges in preparedness, response, and recovery. Understanding the area's social and economic landscape also helps assess potential social costs from infrastructure damage, including housing, industry, public facilities, essential services, and transportation.

Exploring local demographic data may help to identify groups and geographic areas with specific vulnerability to hazard events. In the context of all-hazards preparedness and response planning, at-risk individuals (often used interchangeably with "vulnerable populations") are defined federally as "children, pregnant women, senior citizens, and other individuals who have access or functional needs in the event of a public health emergency." (42 U.S.C. § 2802(b)(4)(B) (2019)) These populations may include, but are not limited to, individuals who are economically disadvantaged, living with disabilities, dependent on caregivers, from historically marginalized communities, have limited English proficiency or are non-English speaking, lack access to transportation, are experiencing homelessness, or have chronic medical conditions.

Certain populations face greater risk following a natural hazard event due to age, economic mobility, physical disability, geographic location, or a combination of factors. Vulnerability in the face of a hazard event is not a fixed characteristic; the same individual may be at risk for some hazards but not at risk for others. Planning for vulnerable populations in the context of hazard mitigation can help communities to prioritize limited resources where they will be the most effective. Refer to Volume 1, Section 1.4.3, for a more in-depth discussion of planning for vulnerable populations, at-risk individuals with access and functional needs, and environmental justice.

The total population, total number of households, and average household size of the City of St. Helena are presented in Table 4-1, compared to the other municipalities and Napa County. As shown in the table, St. Helena is the third-largest city in Napa County.

Table 4-1: City of St. Helena Population and Households

Area	Total Population	Total Households (HH)	Average HH Size
Napa County	137,384	55,588	2.40
City of Napa	79,233	31,666	2.47
City of American Canyon	21,669	5,924	3.64
City of Calistoga	5,191	2,330	2.20
City of St. Helena	**5,426**	**2,963**	**1.81**
Town of Yountville	3,397	1,824	1.45

Source: ACS 5-Year, 2017-2022

4.2.2.1 Income & Housing

Economic mobility is one of the most important predictors of natural hazard vulnerability. Low-income residents are more likely to occupy housing which is inadequately maintained or otherwise poorly built to withstand extreme events. For example, mobile or modular homes are more susceptible to damage in earthquakes and floods than other types of residences and are less likely to contain air conditioning units to cope with high heat events. In urban areas, low-income residents are more likely to occupy older homes and apartment complexes with unreinforced masonry, which is particularly susceptible to seismic damage.

Low-income households and communities face disproportionate financial burden from costs associated with disaster preparedness, response, and recovery. Disasters create unexpected expenses which may serve as "tipping points" for families and individuals living on the edge of poverty or homelessness. Recovery costs may be higher for those without resources to conduct hazard mitigation activities ahead of time. Families and individuals who lack access to transportation may be unable to evacuate ahead of an emergency. (Krause & Reeves, 2017)

Low-income residents and renters are also less likely to purchase insurance, meaning that those with the most to lose during an event are also the least prepared to deal with potential losses. Major hurricane events in recent history such as Harvey, Irma, and Katrina all demonstrate that low-income or historically marginalized communities face increased vulnerability to hazard events and struggle the most to recover.

Median household income in the City of St. Helena was approximately $135,781, with an overall poverty rate of around 6%. By comparison, median income and poverty rates for Napa County were nearly $106,000 and 8%, respectively; refer to Table 4-2. Median income and poverty rates are also shown on the block group level in Figure 4-2 and Figure 4-3.

Table 4-2: City of St. Helena Income and Poverty

Area	Median Income	Poverty Rate
Napa County	$105,809	7.9%
City of Napa	$100,273	8.1%
City of American Canyon	$122,694	7.4%
City of Calistoga	$96,667	5.4%
City of St. Helena	**$135,781**	**5.7%**
Town of Yountville	$75,134	10.6%

Source: ACS 5-Year, 2017-2022

Renters are also more vulnerable to natural hazards, as they are less likely to take out property insurance and the decision to make major structural improvements typically lies with the property owner. Federal disaster recovery services can exacerbate inequality between renters and homeowners; payout amounts are significantly higher for homeowners applying through FEMA's Individual Assistance (IA) program; from 1999 to 2013 U.S. homeowners saw their wealth increase with local hazard damages, whereas renters' wealth decreased. (Howell, Junia; Elliot, James, 2019)

Approximately 44% of occupied housing units in the City of St. Helena are renters, compared to approximately 35% for Napa County as a whole; refer to Table 4-3.

Table 4-3: City of St. Helena Renter- and Owner-Occupied Housing

Jurisdiction	# Occupied Housing Units	# Renter Occupied	% Renter Occupied	# Owner Occupied	% Owner Occupied
Napa County	49,738	17,676	35.5%	32,062	64.5%
City of Napa	26,978	10,616	39.4%	16,362	60.6%
City of American Canyon	6,192	1,371	22.1%	4,821	77.9%
City of Calistoga	2,042	822	40.3%	1,220	59.7%
City of St. Helena	**2,380**	**1,048**	**44%**	**1,332**	**56.0%**
Town of Yountville	1,050	362	34.5%	688	65.5%

Source: ACS 5-Year, 2017-2022

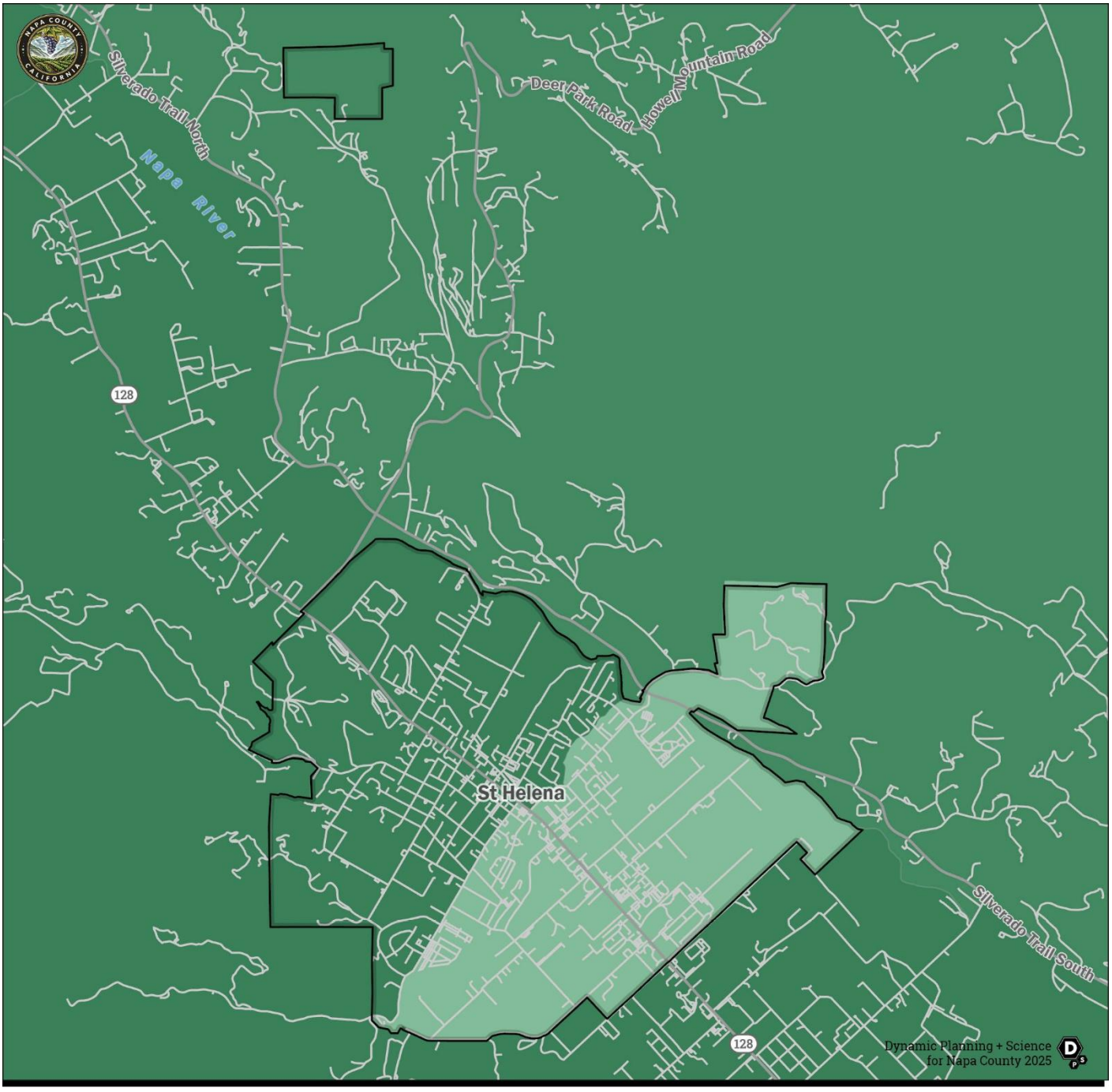


Figure 4-2: City of St. Helena Median Household Income Map

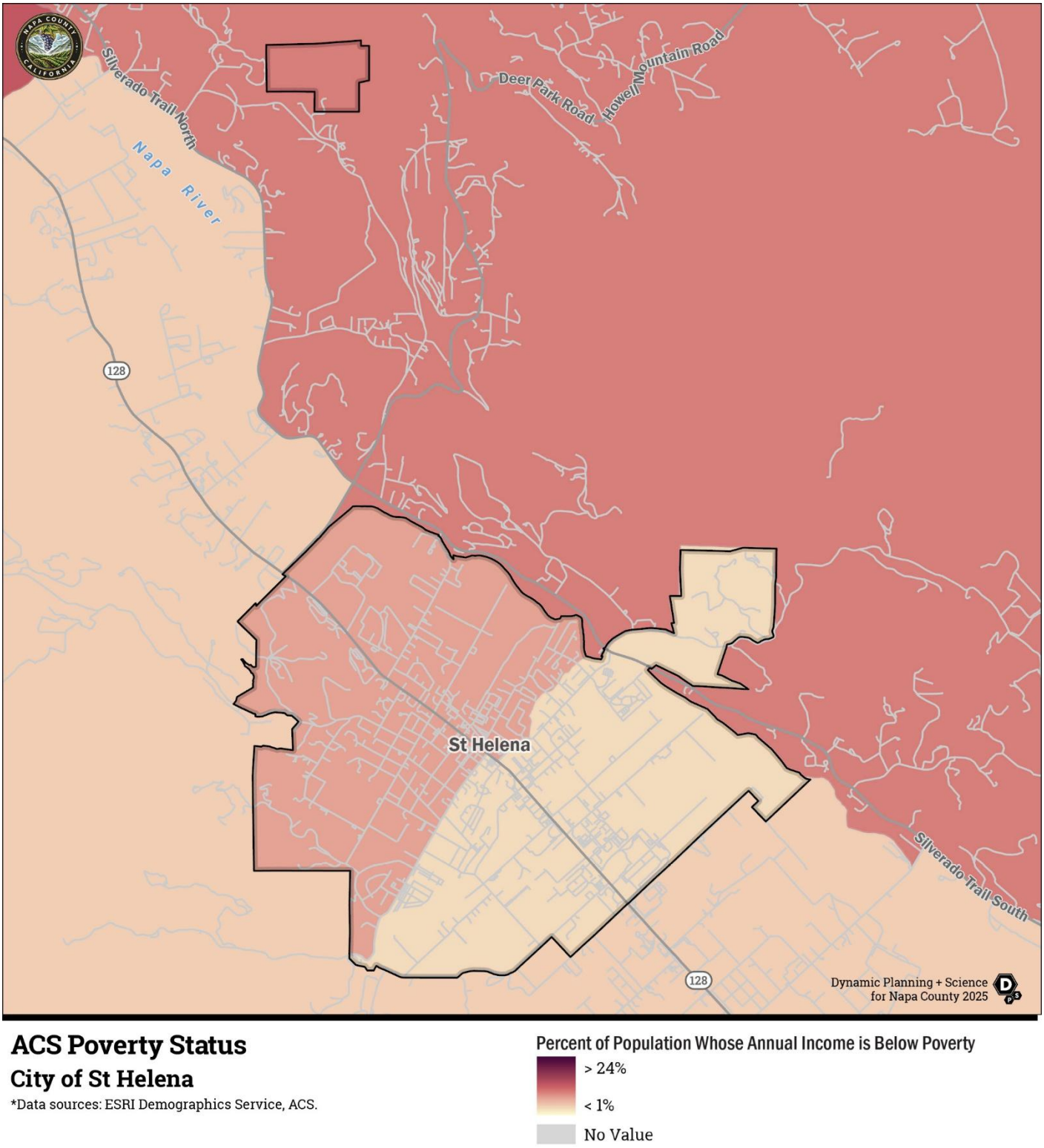


Figure 4-3: City of St. Helena Poverty Status Map

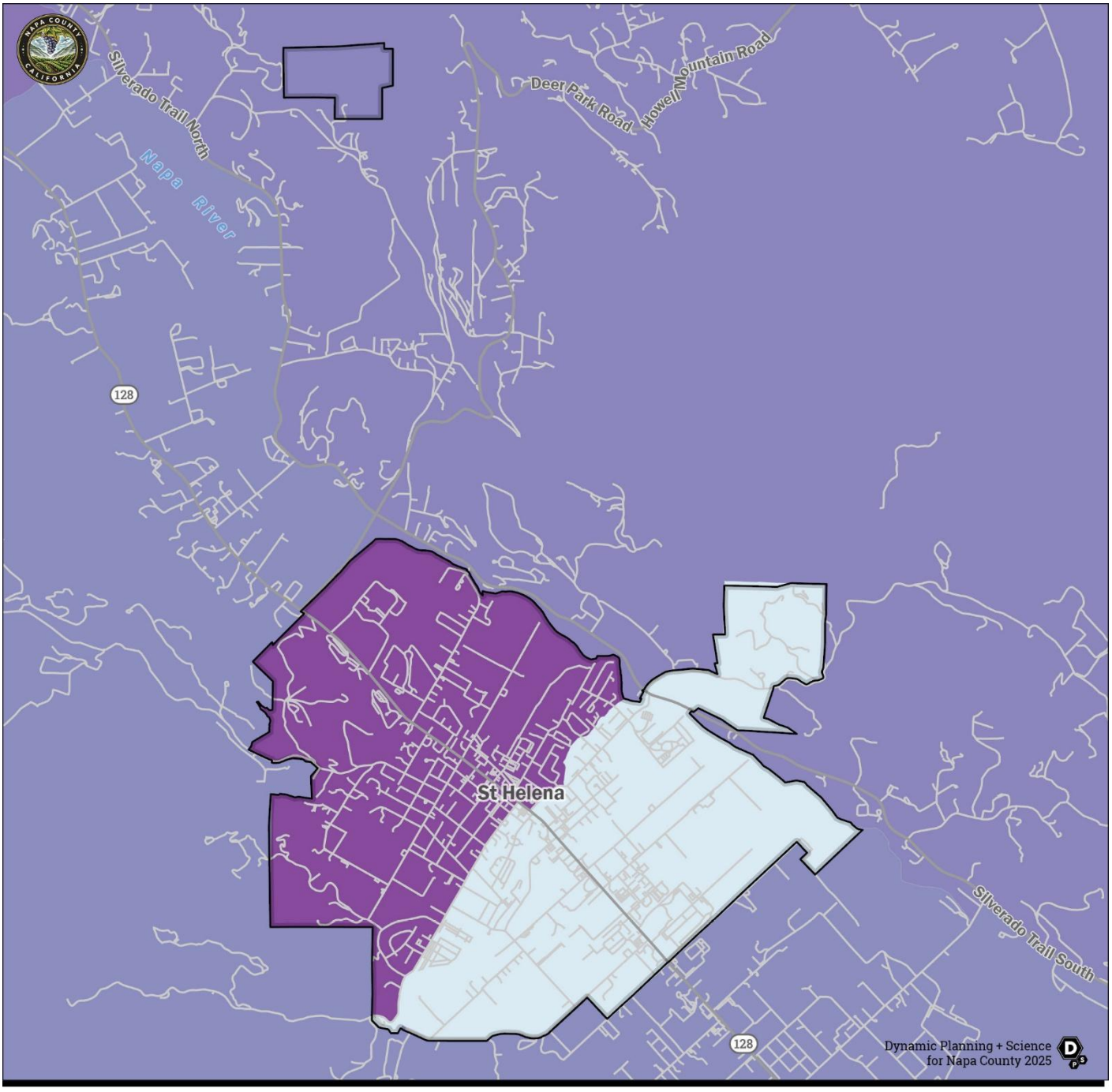


Figure 4-4: City of St. Helena Housing Occupancy Map

4.2.2.2 Dependent & Disabled Populations

Age is a significant factor in assessing vulnerability to natural hazards. Both older adults and children are considered dependent populations due to their reliance on caregivers for safety, mobility, and support during emergency events. These populations face heightened risks during disasters such as floods, wildfires, and earthquakes, particularly when compounding factors such as poverty, disability, or social isolation are present.

In the City of St. Helena, approximately 39% of households include at least one individual over the age of 65, and 10% of all households consist of seniors living alone. While only around 1% of senior households live below the poverty line (Table 4-4), seniors, particularly those who are low-income or socially isolated, remain among the most vulnerable populations in disaster situations. Challenges for older adults may include limited mobility, chronic health conditions, reduced digital literacy, and lack of access to real-time emergency alerts. Seniors living alone may require additional assistance during evacuations or power outages, and assisted living facilities necessitate advanced coordination to ensure continuity of care and safety during emergencies.

Children represent another dependent population requiring special consideration (Table 4-5). In St. Helena, nearly 21% of households include individuals under the age of 18, with around 6% of these households headed by a single caregiver. During emergencies, children are entirely dependent on caregivers for decision-making, transportation, and access to essential resources. Disruptions to schools, childcare, and youth services can result in significant emotional, educational, and developmental impacts. Families with limited means or single caregivers may also face greater challenges in securing housing, supplies, and recovery assistance.

Figure 4-5 highlights areas within St. Helena with higher concentrations of economically dependent age groups, informing targeted outreach and response strategies during emergencies.

Table 4-4: City of St. Helena Households with Seniors

Jurisdiction	Households (HH)	65+	%	65+ Alone	%	65+ Poverty	%
Napa County	55,588	18,777	33.8%	4,816	8.7%	1,271	2.3%
City of American Canyon	5,924	1,772	29.9%	184	3.1%	111	1.9%
City of Calistoga	2,330	1,003	43.0%	419	18.0%	101	4.3%
City of Napa	31,666	10,299	32.5%	2,674	8.4%	703	2.2%
City of St. Helena	**2,963**	**1,153**	**38.9%**	**296**	**10.0%**	**42**	**1.4%**
Town of Yountville	1,824	873	47.9%	351	19.2%	77	4.2%

Source: ACS 5-Year, 2017-2022

Table 4-5: City of St. Helena Households with Children

Jurisdiction	Households	<18	%	<18 Single Caregiver	%
Napa County	55,588	14,596	26.3%	3,109	5.6%
City of American Canyon	5,924	2,633	44.4%	417	7.0%
City of Calistoga	2,330	471	20.2%	33	1.4%
City of Napa	31,666	8,934	28.2%	2,315	7.3%
City of St. Helena	**2,963**	**619**	**20.9%**	**168**	**5.7%**
Town of Yountville	1,824	160	8.8%	0	0.0%

Source: ACS 5-Year, 2017-2022

Elderly populations face increased risks during disaster events due to age-related health conditions, mobility limitations, and potential social isolation. In St. Helena, approximately 13% of the non-institutionalized population lives with a disability, a slightly higher rate than the countywide average of 12% (Table 4-6).

Among those with access and functional needs, elderly individuals with disabilities represent a highly vulnerable subpopulation when it comes to disaster preparedness, response, and recovery. This group includes seniors living with physical or cognitive impairments such as hearing or vision loss, reduced mobility, reliance on assistive medical devices, neurodivergence, or chronic health conditions that may be exacerbated by hazard events (e.g., exposure to wildfire smoke or extreme heat).

Figure 4-6 illustrates that in some portions of the city, more than 47% of the elderly population is estimated to have one or more disabilities, while other areas show lower proportions or lack available data. The spatial distribution shown on this map suggests that vulnerability is not uniform across the city and that certain neighborhoods may have greater needs for evacuation assistance, medical support, and continuity of care during emergencies. Seniors with disabilities may also be more sensitive to extended power outages, disruptions to medical services, and transportation interruptions. These risks are expected to increase under climate change conditions that intensify extreme heat events and strain emergency response resources.

The combination of advanced age and disability can present significant challenges not only during emergency response but also in implementing hazard mitigation measures. Elderly individuals with disabilities may face physical, financial, or logistical barriers to undertaking activities such as seismic retrofitting, anchoring fuel tanks, installing foundation bracing, or implementing residential flood-proofing techniques. Many live in older housing stock that is more vulnerable to earthquake damage or repetitive flooding and may lack the resources or support networks needed to complete mitigation upgrades.

Table 4-6: City of St. Helena Population with Disabilities and Access to Transportation

Jurisdiction	Population	Persons w/ Disability	%	Persons Reliant on Public Trans.	%	Households	HH w/o Vehicle	%
Napa County	137,384	16,544	12.0%	890	0.6%	55,588	2,421	4.4%
City of American Canyon	21,669	2,201	10.2%	287	1.3%	5,924	138	2.3%
City of Calistoga	5,191	573	11.0%	36	0.7%	2,330	83	3.6%
City of Napa	79,233	9,837	12.4%	291	0.4%	31,666	1,554	4.9%
City of St. Helena	**5,426**	**683**	**12.6%**	**121**	**2.2%**	**2,963**	**219**	**7.4%**
Town of Yountville	3,397	683	20.1%	15	0.4%	1,824	210	11.5%

Source: ACS 5-Year, 2017-2022

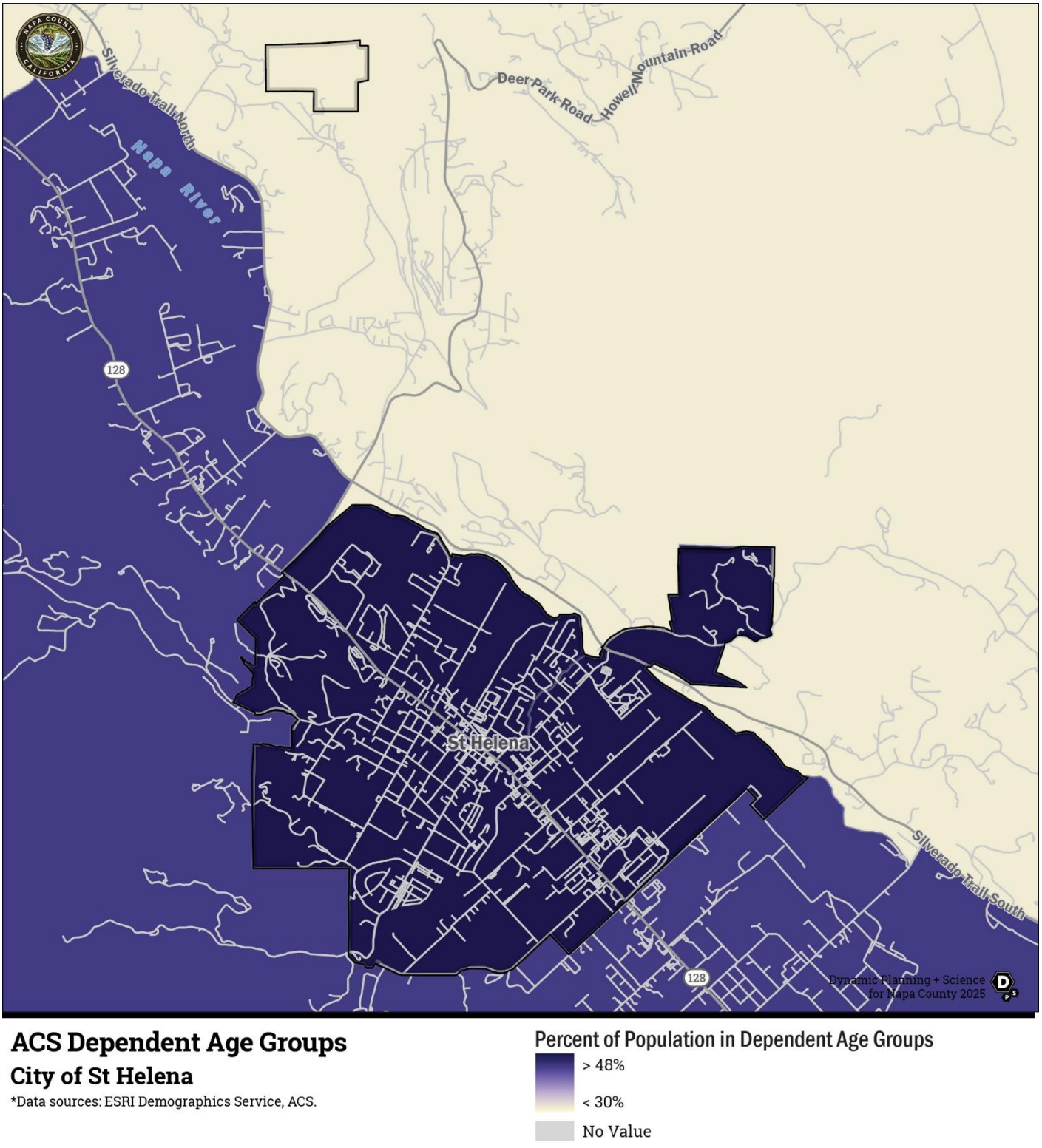


Figure 4-5: City of St. Helena Dependent Age Groups Map

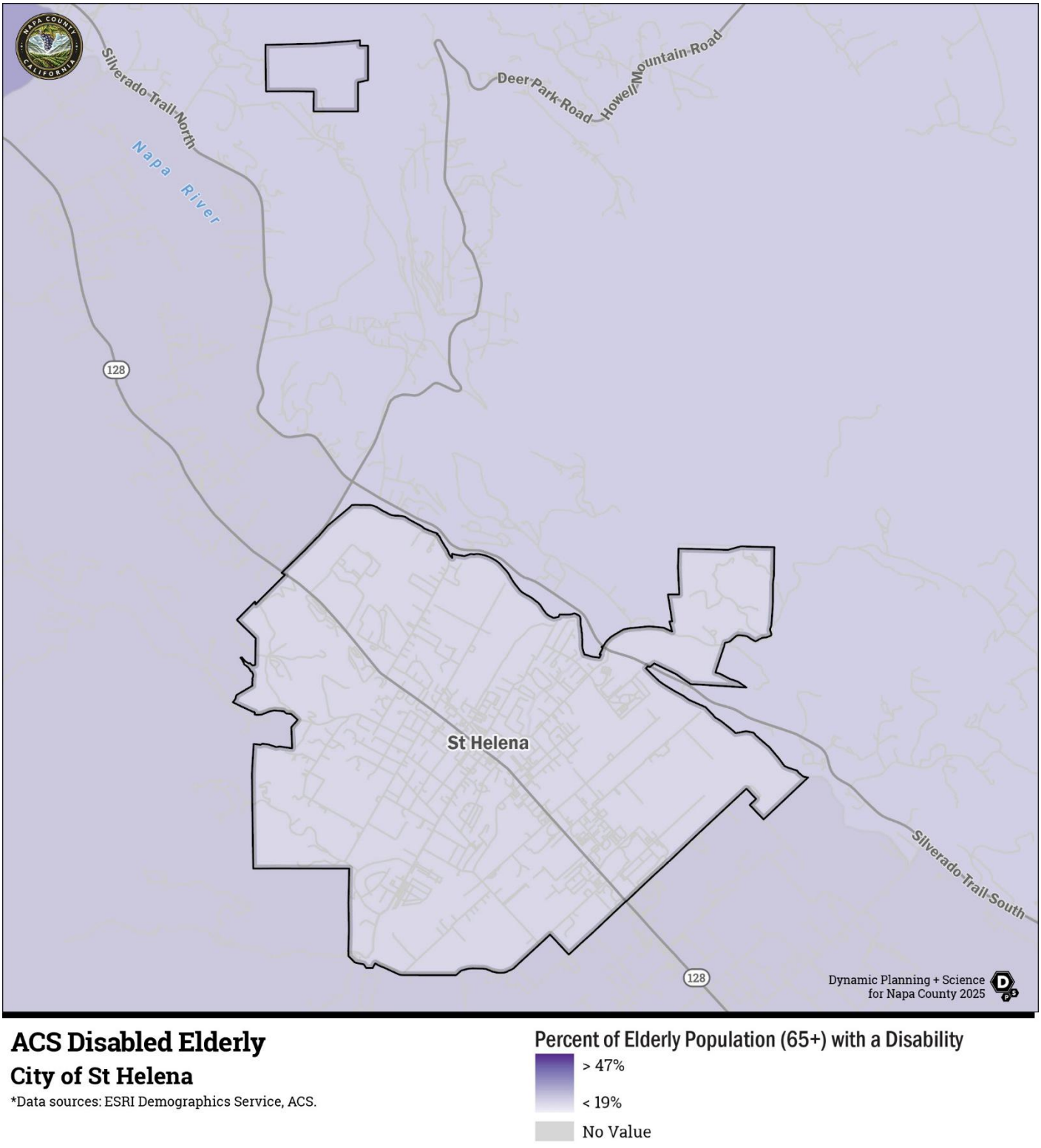


Figure 4-6: City of St. Helena Disabled Elderly Map

4.2.2.3 Race, Ethnicity & Language

Natural disasters compound racial disparities; non-white individuals and communities receive less recovery aid from FEMA than their white counterparts, even where the amount of damage is the same. (Howell, Junia; Elliott, James R., 2019) (National Advisory Council, 2020) These disparities are evidence of the complicated relationship between disaster recovery and overlapping social vulnerabilities including race, income, language, and health. Black and Latino residents are more likely to be low income and renters, conditions which create barriers to navigating FEMA's Individual Assistance programs. Communities with more non-white residents may have lower tax revenue and property values, which means less investment in mitigation and rebuilding efforts before and after an emergency.

Figure 4-7 depicts the racial and ethnic composition of the City of St. Helena. According to ACS data, the city is mostly White, but also has a significant Hispanic or Latino population.

Residents with limited English proficiency (LEP) face heightened barriers to understanding emergency alerts, accessing preparedness resources, and navigating post-disaster recovery programs. In St. Helena, approximately 12% of households speak Spanish, but only around 3% report limited English proficiency. (Table 4-7). Figure 4-8 highlights where Spanish-speaking populations are concentrated in St. Helena.

Table 4-7: City of St. Helena Household Languages

Jurisdiction	Households (HH)	Spanish Speaking	%	Limited English	%	Other Lang.	%
Napa County	55,588	8,738	15.7%	2,141	3.9%	12	0.0%
City of American Canyon	5,924	1,069	18.0%	177	3.0%	-	0.0%
City of Calistoga	2,330	474	20.3%	63	2.7%	-	0.0%
City of Napa	31,666	5,800	18.3%	1,653	5.2%	9	0.0%
City of St. Helena	**2,963**	**370**	**12.5%**	**88**	**3.0%**	**-**	**0.0%**
Town of Yountville	1,824	49	2.7%	21	1.2%	-	0.0%

Source: ACS 5-Year, 2017-2022

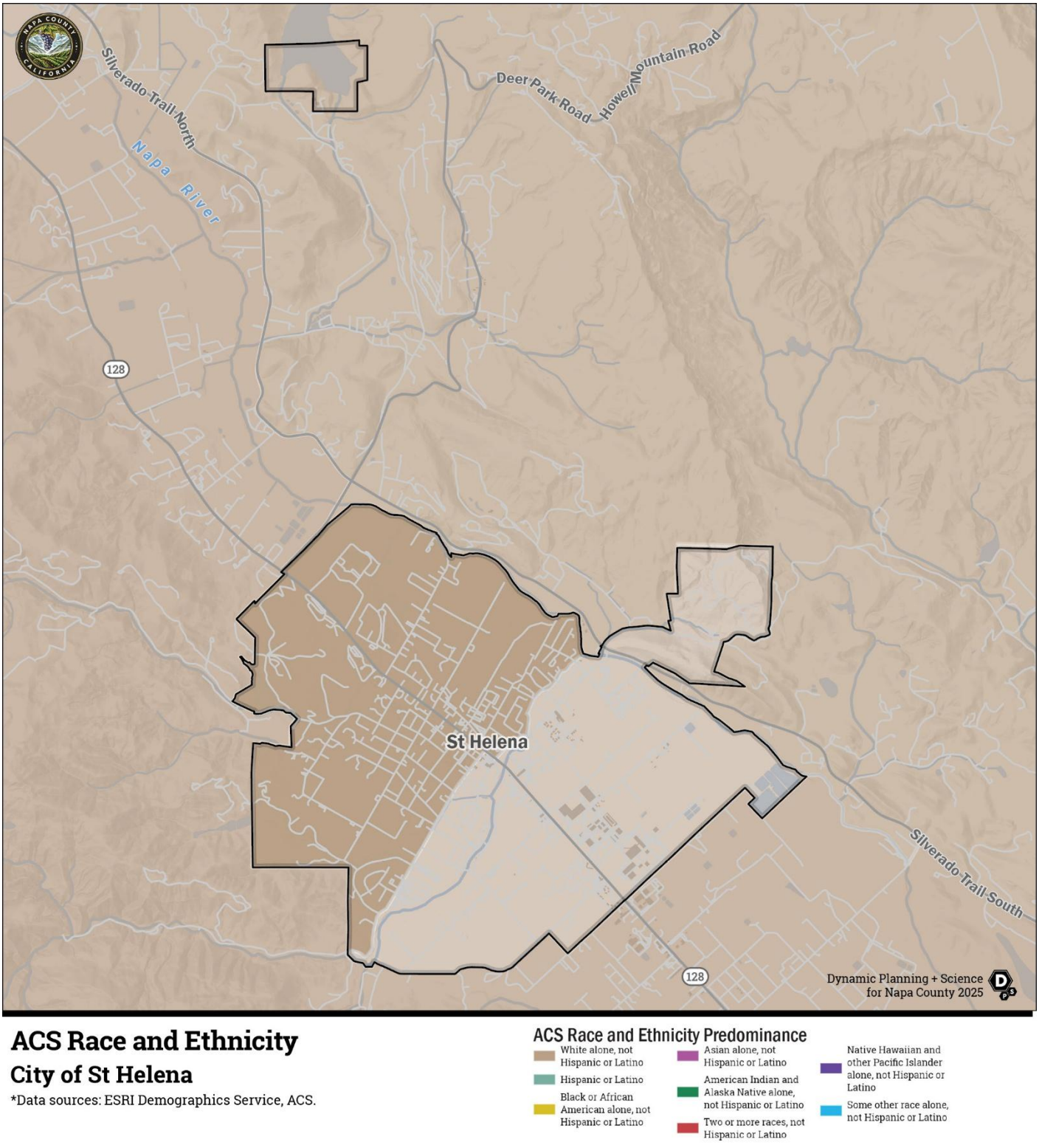


Figure 4-7: City of St. Helena Race and Ethnicity Map

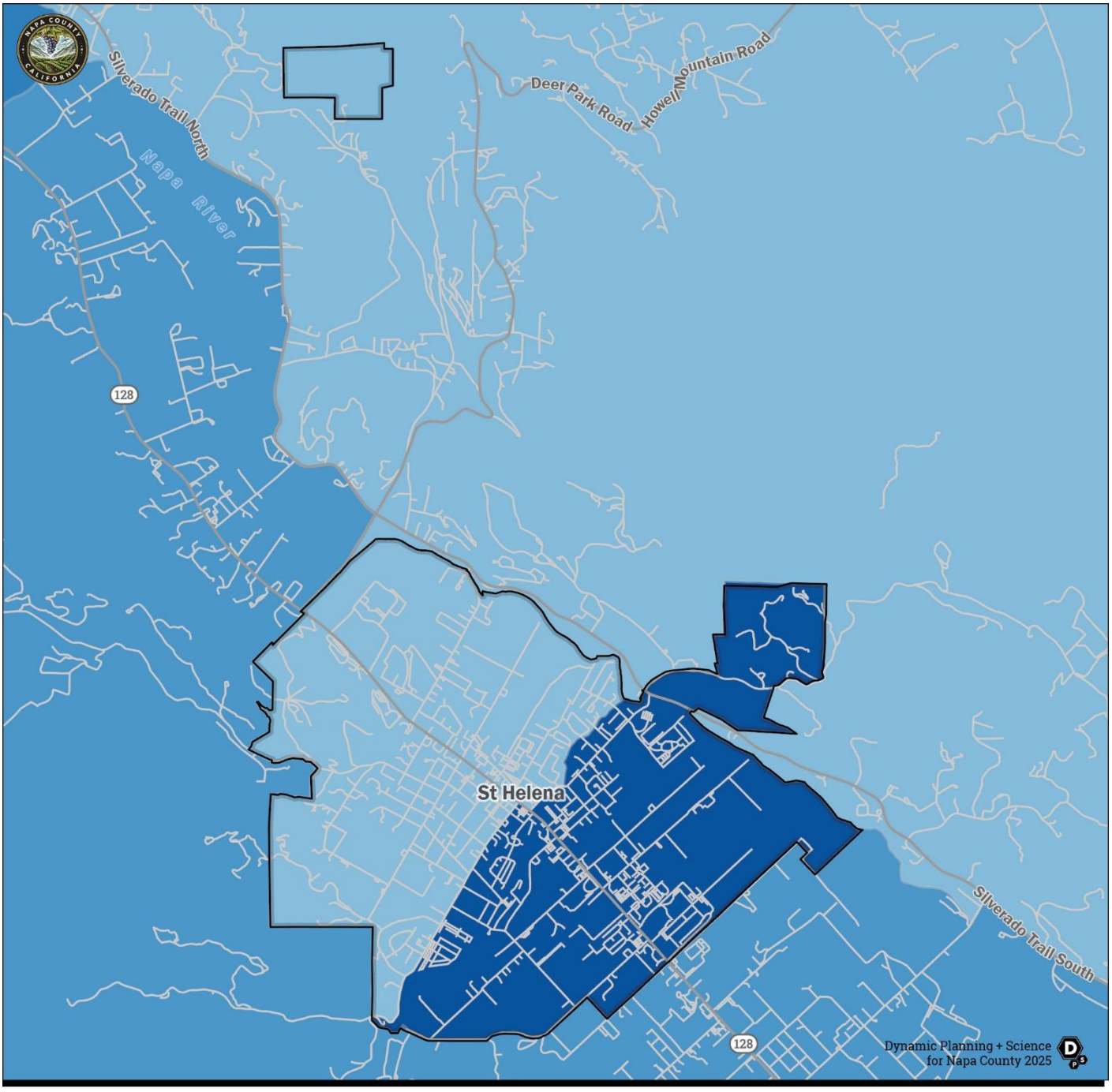


Figure 4-8: City of St. Helena Spanish-Speaking Households Map

4.2.2.4 Social Vulnerability Index (SVI)

The Centers for Disease Control and Prevention (CDC) Social Vulnerability Index (SVI) for City of St. Helena reveals important spatial and demographic patterns that have direct implications for equitable hazard mitigation planning. As discussed in detail in Volume 1, Section 1.4.3.6, the SVI is a composite measure developed by the CDC to identify communities that are more likely to require support before, during, and after a disaster. It incorporates a range of factors across four key dimensions: socioeconomic status, household composition and disability, minority status and language, and housing type and transportation access. The resulting index score ranges from 0 (lowest vulnerability) to 1 (highest vulnerability).

Figure 4-9 shows that social vulnerability ranges between 0.50 and 1.00 in St. Helena, which is indicative of moderate to high SVI. Areas with higher SVI values indicate neighborhoods where residents may have reduced capacity to prepare for, respond to, and recover from hazard events due to factors such as lower income, higher proportions of renters, limited access to vehicles, language barriers, or greater concentrations of elderly and disabled individuals. Conversely, areas with lower SVI scores generally reflect populations with greater access to resources and adaptive capacity.

Spatial patterns in the SVI map suggest that higher social vulnerability is concentrated in portions of the central and southern areas of the city, where multiple vulnerability indicators overlap. These areas may experience disproportionate impacts during events such as flooding, extreme heat, earthquakes, or wildfire smoke episodes, particularly if hazards coincide with power outages, transportation disruptions, or prolonged recovery periods. Residents in higher-SVI neighborhoods may also face challenges accessing emergency information, evacuation assistance, sheltering, and post-disaster financial or housing resources.

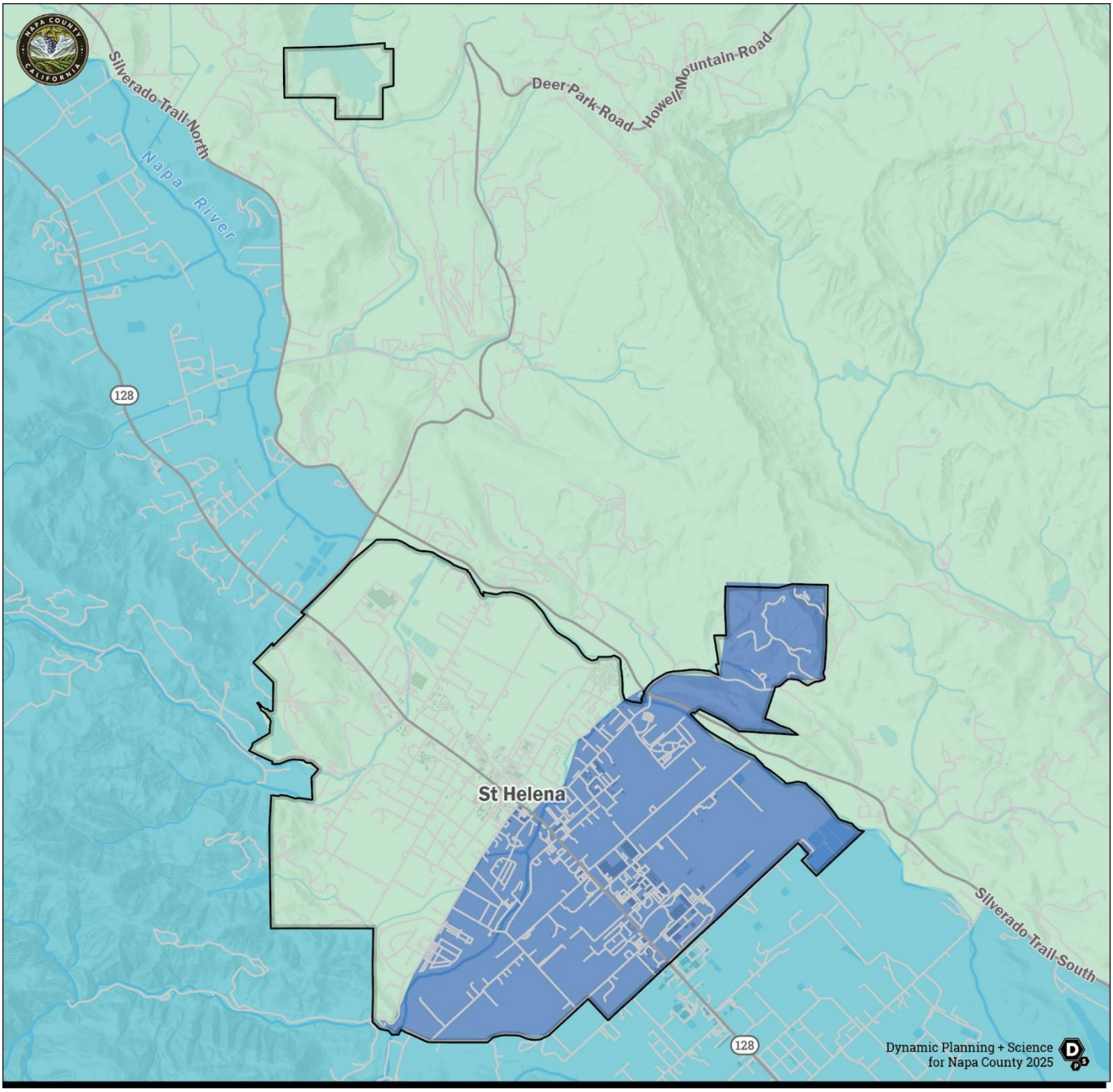


Figure 4-9: City of St. Helena CDC Social Vulnerability Index Map

4.2.3 Economy

The City of St. Helena plays an important economic role within central Napa County, serving as a local employment center and tourism hub. St. Helena serves as a commercial and business center for the surrounding towns and unincorporated areas, including Calistoga, Angwin, Deer Park, Rutherford, and the unincorporated area south of St. Helena. The local economy is largely centered around visitor-serving commercial uses and wine production. St. Helena is also home to or located near three higher educational institutions: the Culinary Institute of America, Napa Valley College Upper Valley Campus, and Pacific Union College in Angwin.

Retail, restaurants, and visitor-serving commercial uses are primarily concentrated on Main Street (Highway 29). These businesses contribute significantly to local tax revenues and provide jobs for residents of St. Helena and surrounding communities. At the same time, the concentration of economic activity along Main Street increases the importance of protecting critical infrastructure, transportation corridors, and utility systems from natural hazards such as flooding, earthquakes, and power outages.

The city's commercial economy includes neighborhood-serving retail, restaurants, and personal services that support daily needs and contribute to community vitality. These businesses are particularly sensitive to hazard-related disruptions, as temporary closures, infrastructure damage, or reduced access can result in lost income and longer-term economic impacts. Small businesses may have limited capacity to absorb prolonged disruptions, making economic resilience an important consideration in hazard mitigation planning.

A significant portion of St. Helena's workforce is employed in sectors that involve physical labor or outdoor activity, including agriculture and visitor-serving commercial uses. These workers may face heightened exposure to hazards such as extreme heat, wildfire smoke, and poor air quality. Climate change projections indicating more frequent heat events and longer wildfire seasons have implications for worker safety, productivity, and business continuity within these sectors.

Economic vulnerability is also influenced by income variability and employment stability. Workers in hourly or service-based positions may experience immediate income loss during disaster-related closures or evacuations, which can compound household vulnerability and slow community recovery. Protecting employment centers, maintaining transportation access, and ensuring continuity of utilities and communications are therefore key components of reducing economic disruption from hazard events.

4.2.4 Growth Trends & Future Development

The City of St. Helena has experienced moderate growth since the 1970s, with development patterns shaped by adopted growth management policies, infrastructure capacity, and regional housing demand. Growth in recent decades has occurred primarily through planned residential development and visitor-serving commercial uses. This approach reflects the city's long-standing emphasis on directing growth toward areas that can be efficiently served by public services and infrastructure while limiting outward expansion into agricultural and environmentally sensitive lands.

Residential growth has been driven largely by approved specific plans and infill development within existing neighborhoods. Recent development activity has included a mix of single-family and multi-family housing intended to accommodate population growth and meet state-mandated housing requirements. The City's Housing Element and Annual Progress Reports document continued efforts to increase housing supply while addressing affordability, infrastructure demands, and community character.

Future development in St. Helena is expected to continue focusing on buildout of remaining developable parcels within the Urban Limit Line and Sphere of Influence. Planned growth areas are generally located near existing transportation corridors, utilities, and employment centers, supporting more compact and efficient development patterns. This strategy reduces the need for extensive new infrastructure and helps limit exposure to hazards associated with hillside development, wildfire risk, and access constraints.

Economic development is also anticipated to remain a key component of future growth. Expansion and intensification of industrial and commercial uses, particularly those related to logistics, manufacturing, and the wine industry, are expected to support employment and fiscal stability. At the same time, continued development in flood prone areas and near critical transportation routes underscores the importance of incorporating hazard mitigation and climate adaptation measures into future land use and infrastructure planning.

4.3 Planning Process

The City of St. Helena followed the planning process detailed in Volume 1, Section 2, including participating in the county-wide Hazard Mitigation Planning Team (HMPT) and formulating their own internal planning team to support the broader planning process.

The city's representatives in the Steering Group led stakeholder and public engagement efforts alongside the Consultant Team, with assistance from the county-wide HMPT and their internal planning team. This engagement process is described in Volume 1. Specifically, for the City of St. Helena, this included postings to the city website and social media, and outreach events, as documented in Appendix B. Examples of Key Stakeholders engaged by Napa County on behalf of the city with relevance to the development of St. Helena's mitigation strategy include the USDA and other federal agencies; CAL FIRE and other state agencies; other neighboring jurisdictions; community-based organizations such as the Chamber of Commerce; utility providers like PG&E; UC Davis and other academia; and local businesses.

All Key Stakeholders that were invited to participate in the planning process are listed in Volume 1, Section 2, and the input received from stakeholders was integrated into the city's annex, as described in Volume 1 Table 2-9. The city's internal planning team participants, their positions, and how they participated in the planning process are shown in Table 4-8.

Table 4-8: City of St. Helena Planning Team and Steering Group Members

Team Members	Title	Description of Involvement
Anil Comelo	**City Manager (former)**	**Lead Point-of-Contact, HMPT #1 and #2**
John Sorensen	**Fire Chief**	**Alternate Point-of-Contact, HMPT #1, #2, #3 and #4, BO #1 and #2**
Andrew Bradley	Program Manager	Participating Stakeholder, BO #1 and #2
Chris Hartley	Police Chief (former)	Participating Stakeholder, BO #1
Dave Jahns	Parks and Recreation Director (former)	Participating Stakeholder, BO #1 and #2
Jackie Oneal	Senior Planner	Participating Stakeholder, BO #1 and #2
Leza Mikhail	Director of Community Development	Participating Stakeholder
Maya DeRosa	Planning and Building Director (former)	Participating Stakeholder, BO #1
Joseph Leach	Public Works Director / City Engineer	Participating Stakeholder, BO #1 and #2
Justin Tharp	Police Lieutenant	Participating Stakeholder, BO #1
Lesley Milton	Deputy City Manager (former)	Participating Stakeholder, BO #1 and #2
Mandy Kellogg	Administrative Services Director	Participating Stakeholder, BO #1 and #2
Phillip Henry	Chief Building Official	Participating Stakeholder, BO #1 and #2

City of St. Helena participated in a comprehensive hazard mitigation planning process as part of the 2026 Napa County MJHMP update. This included a series of breakout meetings, listed in Table 4-9 that engaged the district's planning team, which included key city personnel and stakeholders in evaluating hazards, identifying local vulnerabilities, and prioritizing mitigation strategies.

The process began with a County-Wide Steering Group Kickoff Meeting on February 28, 2024. This initial meeting focused on welcoming participants, establishing a shared understanding of the project scope and schedule, clarifying roles and responsibilities of the Steering Group, the county-wide Hazard Mitigation Planning Team (HMPT), and individual jurisdictional planning teams, and included a review of key changes since the 2020 Local Hazard Mitigation Plan The meeting set the foundation for coordinated participation throughout the planning effort.

Throughout the series of breakout meetings, the City of St. Helena engaged in a structured and collaborative planning process focused on assessing hazard risks, identifying vulnerabilities, and developing targeted mitigation strategies. The meetings began with recaps of the county-wide HMPT meetings to ensure alignment of goals and progress.

During the September 24, 2024, breakout out meeting, discussions concentrated on community engagement outcomes, initial risk assessments, and the integration of demographic data to better understand vulnerable populations. Jurisdictional teams reviewed their specific hazard exposures using the Risk Assessment Mapping Platform (RAMP) and participated in prioritization exercises to identify their top hazards.

The June 18, 2025, breakout meeting shifted toward reviewing local capabilities and defining specific areas of concern, which informed the drafting of problem statements. Teams worked collaboratively to refine mitigation alternatives, align actions with FEMA guidelines, and develop a shortlist of priority mitigation actions and inter-jurisdictional collaboration opportunities. Participants also engaged in a hexagon mapping activity designed to visually identify mitigation actions that could benefit from or require inter-jurisdictional coordination. These collaborative efforts helped shape a refined set of mitigation alternatives, establish shared planning goals, and align local strategies with FEMA's Hazard Mitigation Assistance (HMA) funding framework. The meetings also included consensus-building activities around hazard rankings, capabilities, and planned actions, while providing regular updates on the overall project schedule.

Table 4-9: City of St. Helena Planning Team Meetings

Meeting & Date	Agenda / Topics	Goals / Key Inputs
County-Wide Steering Group and HMPT Kick-off and Meetings #1 & #2 February 28, 2024– July 18, 2024		
St. Helena Planning Team Breakout Meeting #1 September 24, 2024	▪ County-wide HMPT meetings #1 and #2 recaps ▪ Community engagement progress and results ▪ Risk assessment and community vulnerability ▪ Demographics and vulnerable populations ▪ Overview of jurisdiction-specific hazard risks and exposure ▪ Introduction to Risk Assessment Mapping Platform (RAMP) ▪ Jurisdiction-specific hazard risk ranking exercise ▪ Project schedule updates and next steps	▪ Consensus on jurisdiction-specific priority hazards ▪ Identify capabilities and potential mitigation actions ▪ Community engagement volunteers
County-Wide HMPT Meeting #3 March 25, 2025		
St. Helena Planning Team Breakout Meeting #2 June 18, 2025	▪ Breakout Meeting #1 and HMPT #3 recaps ▪ Review capabilities assessment ▪ Review areas of concern and define problem statements ▪ Principles of effective mitigation strategies and actions, and mitigation alternatives ▪ Refine and align jurisdiction-specific mitigation actions exercise ▪ Project schedule updates and next steps	▪ Consensus on jurisdiction-specific capabilities ▪ Consensus on jurisdiction-specific areas of concern ▪ Consensus on priority mitigation actions and collaboration opportunities ▪ Community engagement volunteers
County-Wide HMPT Meeting #4 December 10, 2025		

4.3.1 Public Input & Draft Review

As detailed in Volume 1, Section 2, the draft plan was available for public review and comment from May 15 to June 2, 2026. Public comments received during that time were similar to those gathered throughout the public engagement process, including the need for more equity in the distribution of mitigation activities and funding and the need for enhanced cooperation among jurisdictions, utility providers, and state agencies. More specifically for St. Helena, public feedback received requested additional information and clarity about the risk assessment as well as updates to city plans and policies, such as the General Plan Safety Element, to better integrate equitable hazard mitigation. These comments were incorporated into the city's mitigation strategy, as appropriate; although, most were already addressed by the Mitigation Action Plan which was based on previous public input. Integration of this MJHMP and municipal annex with the General Plan, Municipal Code, and other city plans and policies will occur throughout the next five-year implementation period, as described in Volume 1, Section 2, and Section 4.6.1.

Public and stakeholder input was gathered and incorporated throughout the plan development process, before the public review period, such as from the online public survey (see Volume 1, Section 2.1.2 and Appendix B, for details). During the review period, jurisdictional staff and stakeholders that participated in the plan development also reviewed the public draft and provided comments on minor corrections and revisions, which were addressed in the final plan.

4.4 What's New

This section provides an overview of hazard mitigation planning efforts for the planning area and highlights the updates made in the 2026 MJHMP. The City of St. Helena previously participated and maintained a Hazard Mitigation Plan, which guided resilience planning and hazard mitigation actions at the city level. St. Helena is updating their current plan on a county wide level. This integration reflects the city's ongoing commitment to regional resilience and acknowledges that many hazards such as flooding, severe storms and earthquakes cross jurisdictional boundaries.

Through participation in the MJHMP, St. Helena has identified its highest priority hazards, developed hazard specific problem statements, and proposed actionable strategies to reduce risks. By aligning with countywide partners and leveraging regional resources, St. Helena has strengthened its capacity to prepare for, withstand, and recover from disasters while continuing to protect its unique community character.

4.4.1 Mitigation Activities

The city has successfully implemented several initiatives aimed at addressing identified vulnerabilities. Some of these accomplishments are highlighted in this section and have directly contributed to reducing risks from hazards such as flooding, all hazards, and severe weather. These completed projects showcase St. Helena's ability to effectively plan, fund, and execute measures that protect its residents and infrastructure.

In addition, St. Helena has systematically reviewed and adjusted its mitigation actions, exemplifying adherence to FEMA's Planning Policy Guide principles and emphasizing the importance of dynamic and adaptive mitigation planning. By fostering partnerships, leveraging funding opportunities, and prioritizing equity in implementation, the city aligns with best practices to build resilience against natural disasters. This ongoing effort is a testament to the city's commitment to the principles of risk-informed decision-making, equitable resource allocation, and integration with broader regional and state hazard mitigation objectives.

Adjustments to Previous Mitigation Actions

A significant portion of the city's mitigation efforts remain ongoing or in the pipeline. These actions, ranging from infrastructure upgrades to community outreach initiatives, represent the city's proactive approach to addressing hazards as resources become available.

Recognizing constraints such as limited funding, staffing, and shifting priorities, the city has reevaluated certain initiatives, leading to their reprioritization or canceling of mitigation actions. Factors such as feasibility, cost-effectiveness, and emerging risks informed these decisions, ensuring alignment with the city's updated hazard mitigation goals. Adjustments to previous mitigation actions are documented as part of the City of St. Helena's Mitigation Action Plan Table 4-17, and more specific status updates are provided in Table 4-18.

4.4.2 Mitigation Successes

Since the adoption of the 2021 Hazard Mitigation Plan, the City of St. Helena has made measurable progress in implementing mitigation actions that reduce risk and enhance community resilience. These successes reflect the City's continued commitment to integrating hazard mitigation into local planning, capital improvement projects, and community programs.

The following success stories highlight completed and ongoing efforts that address key hazards such as drought, climate change, and resource sustainability. Collectively, these initiatives demonstrate the City's ability to move from planning to implementation by leveraging regulatory tools, aligning with state requirements, and advancing projects that provide long-term risk reduction benefits to the community.

Water Conservation & Drought Resilience through Landscape Standards (WELO)

The City of St. Helena has implemented water-efficient landscape requirements through adoption of the State of California's Water Efficient Landscape Ordinance (WELO) into its local zoning and development code, ensuring that new development and significant landscape renovations incorporate long-term water conservation measures. This regulatory approach supports drought resilience and sustainable water use by requiring efficient irrigation systems, climate-appropriate plant selection, and limits on high-water-use landscaping.

Under WELO, new development projects are required to prepare landscape documentation that demonstrates compliance with water budgets, including maximum applied water allowance (MAWA) calculations and efficient irrigation design. These requirements promote the use of drought-tolerant and native vegetation, reduce reliance on potable water for irrigation, and improve overall landscape performance during periods of water scarcity.

The ordinance serves as a proactive mitigation measure by reducing community-wide water demand and increasing resilience to drought conditions, which are expected to intensify due to climate change. By integrating water efficiency standards into the development review process, the City ensures that future growth does not exacerbate water supply constraints and that landscapes remain sustainable under increasingly variable hydrologic conditions.

In addition to water savings, WELO-compliant landscapes provide co-benefits such as improved soil health, reduced runoff, and enhanced urban aesthetics. The program represents a cost-effective, regulatory-based mitigation strategy that aligns with state water conservation goals while supporting long-term community resilience.

Updated Safety Element

The Safety Element update includes multiple mitigation-forward policies such as tailored evacuation messaging for single-access neighborhoods, assessing ingress/egress improvements, zone-based evacuation planning, siting critical infrastructure outside hazard zones where feasible, and maintaining participation in the Napa County MJHMP update cycle.

4.5 Risk Assessment

This section focuses on profiling hazards specific to the City of St. Helena and assessing their vulnerability independent of the broader county-wide planning area, which has been evaluated in Section 3 of Volume 1. The hazard profiles in Volume 1 discuss overall impacts to the planning area and describe relevant plans, policies, and regulations; past events; location; frequency and probability of future occurrences; severity and extent; warning time; secondary hazards; and climate change impacts. For more information on risk assessment methodologies, see Volume 1, Appendix A.

This section includes a tailored vulnerability assessment, analyzing assets at risk such as population, property, and critical facilities and infrastructure unique to the city, and information on city-specific differences in hazard vulnerability across the planning area. It also identifies total city assets at risk, including people, property, and critical facilities and infrastructure within the city. In addition, this section presents growth and development trends for the community, offering insights into vulnerabilities and risks that represent the broader context of assets at risk.

4.5.1 Hazard Screening & Prioritization

Members of the Planning Team from each participating jurisdiction came together to collaboratively decide which county-wide hazards would be included in the MJHMP, and which would be excluded. Hazard screening and prioritization took place early in the process and integrated historic data, local knowledge, and consensus opinions to create a risk assessment matrix for the county as well as for each participating jurisdiction. These matrices indicate the priority of hazards prior to further refinement. Details about this process, the results of the discussion, and in-depth profiles for county-wide hazards can be found in Volume 1, Sections 2 and 3.

The City of St. Helena's internal planning group used the same hazard identification and prioritization process as the county-wide Planning Team. They reviewed previously prepared hazard mitigation plans and other relevant documents to determine the realm of natural hazards that have the potential to affect the city. Table 4-10 provides a crosswalk of hazards identified in select planning documents, including the 2020 Napa County MJHMP, the City of City of St. Helena General Plan, and the 2023 State of California HMP. The crosswalk was used to develop a preliminary hazards list, providing a framework for the group to evaluate which hazards were truly relevant to the City of St. Helena and which ones were not.

The internal planning group then ranked hazards based on their probability of affecting the City of St. Helena and potential impacts on the community. Figure 4-10 displays the results of the hazard risk ranking exercise that was performed before further refinement. All hazards have been profiled in Volume 1 of this document. The purpose of this annex is to specifically address the city's vulnerability to specifically identified hazards.

Table 4-10: City of St. Helena Document Review of Potential Hazards

Hazard	2020 Napa County MJHMP	City of St. Helena General Plan	2023 California SHMP
Agricultural Pests	■		■
Avalanche			■
Climate Change	■	■	■
Coastal			■
Dam Failure	■		■
Drought	■	■	■
Earthquake / Liquefaction	■	■	■
Extreme Cold			■
Extreme Heat		■	■
Extreme Weather / Storms	■	■	■
Flood	■	■	■
Geologic / Mass Movement	■	■	■
Human-Caused			■
Insects			■
Levee Failure			■
Pandemic Disease	■		■
Sea Level Rise			■
Soil			■
Subsidence			■
Tornado			■
Tsunami / Seiche Wave			■
Volcano			■
Wildfire	■	■	■

Risk Assessment Matrix Definitions

PROBABILITY RATING

The likelihood of a hazard event occurring within a time period?

PROBABILITY

Highly Likely	**Highly likely** - 100% annual probability. Or Likely to occur every year in your lifetime.
Likely	**Likely** - between 10 & 100% annual probability. Or will occur several times in your lifetime.
Possible	**Possible** - between 1 & 10% annual probability. Or Likely to occur some time in your lifetime.
Unlikely	**Unlikely** - less than 1% annual probability. Or unlikely but possible to occur in your lifetime.

IMPACT RATING

In terms of injuries, damage, or death, would you anticipate impacts to be minor, limited, critical, or catastrophic when a significant hazard event occurs? The impact could be in terms of one hazard event (flooding from a culvert failure) or a large-scale event (multiple rivers flooding) in the same jurisdictional boundary.

IMPACT

Minor	Limited	Critical	Catastrophic

Minor - very few injuries, if any. Only minor property damage & minimal disruption on quality of life. Temporary shutdown of critical facilities.

Limited - minor injuries only. Approx. 10% or less of property in disaster footprint damaged or destroyed. Complete shutdown of critical facilities for more than one day.

Critical - multiple deaths/injuries possible. Between 25% and 50% of property in disaster footprint is damaged or destroyed. Complete shutdown of critical facilities for more than one week.

Catastrophic - high number of deaths/injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for 30 days or more.

To concentrate resources, the jurisdictional planning team will focus on "High" and "Extreme" risk hazards, and "Medium" risk hazards to a lesser extent. These hazards have the higher probability and greater impact as it relates to the jurisdictions planning area.

Hazard definitions are included in **Vol. 1** of this plan. Some hazards are discussed as subset hazards— e.g., "Levee Failure" within the "Flood" hazard profile. If a hazard is not present on the risk matrix, is grey, or categorized as a "Low" risk hazard, the jurisdictional planning team felt the hazard had a minimal footprint or impact within their planning area and chose not to profile the hazard.

Hazard Information / Legend:



Climate Change impacts will be addressed within each relevant hazard section within the plan update and as a stand alone section for each jurisdiction. Climate change may change the frequency, duration, or intensity of other hazards profiled.

City of St Helena Risk Matrix

PROBABILITY \ IMPACT	Minor	Limited	Critical	Catastrophic
Highly Likely	Medium	SEVERE WEATHER	WILDFIRE	Extreme
Likely	Medium	FLOOD, EARTHQUAKE	DROUGHT	Extreme
Possible	Low	SLOPE FAILURE	High	DAM FAILURE
Unlikely	Low	Low	Medium	Medium

Figure 4-10: City of St. Helena Risk Assessment Matrix

Note: Hazard naming in the Risk Assessment Matrix may not match the final naming used. Refer to hazards prioritization summary table.

Priority Hazards

The results of the initial risk ranking exercise completed by the city's Planning Team, before further refinement, are identified in the county's completed matrix in Figure 4-10. Table 4-11 provides the final list of priority hazards and subhazards with additional details about why certain hazards were chosen and why others were not prioritized. However, it should be noted that many hazards not prioritized for profiling are briefly discussed as secondary or compounding hazards, and subhazards that were profiled and included in the risk assessment are listed specifically.

Table 4-11: City of St. Helena Hazards Prioritization Summary

Hazard	Priority	Explanation
Earthquake / Liquefaction	**High**	Profiled in Volume 1, Section 3.3.4, and Section 4.5.2.2 in this annex, including Liquefaction
Wildfire	**Extreme**	Profiled in Volume 1, Section 3.3.1, and Section 4.5.2.1 in this annex
Flood	**High**	Profiled in Volume 1, Section 3.3.2, and Section 4.5.2.3 in this annex
Levee Failure	-	Profiled in Volume 1, Section 3.3.2; not a priority due to low probability and impact potential
Extreme Weather / Storms	**High**	Profiled in Volume 1, Section 3.3.5, and Section 4.5.2.7 in this annex as Severe Weather, including High Wind and Heavy Rain (Winter Weather not a priority due to low probability and impact potential)
Drought	**High**	Profiled in Volume 1, Section 3.3.6, and Section 4.5.2.5 in this annex
Geologic / Mass Movement	**Medium**	Profiled in Volume 1, Section 3.3.5, and Section 4.5.2.4 in this annex as Slope Failure
Extreme Heat	**High**	Profiled in Volume 1, Section 3.3.8, and Section 4.5.2.8 in this annex
Agricultural Pests	-	Profiled in Volume 1, Section 3.3.9; not a priority due to low probability and impact potential and jurisdictional focus
Sea Level Rise	-	Profiled in Volume 1, Section 3.3.9; not a priority due to no exposure
Climate Change	**High**	Profiled in Volume 1, Section 3.3.9, and Section 4.5.2.8 in this annex and discussed as a compounding hazard in relevant profiles
Dam Failure	**High**	Profiled in Volume 1, Section 3.3.3, and Section 4.5.2.6 in this annex

4.5.2 Vulnerability to Specific Hazards

Assessing vulnerabilities exposes the unique characteristics of individual hazards and begins the process of narrowing down which areas within the city are vulnerable to specific hazard events. The vulnerability assessment considered unique local knowledge of hazards and impacts and a GIS overlaying method for examining such vulnerabilities in more depth. Using these methods, the city's planning group estimated vulnerable populations, properties, and assets, and potential losses. In addition, the exposure of city assets to drought, geological, earthquake, wildfire and flood hazards were also considered.

Many of the hazard profiles include a snapshot map and damage estimation tables that illustrate the city's vulnerabilities to those specific hazards. These maps assisted the planning group in understanding the hazard exposure of populations, parcels, and critical facilities and infrastructure. Each snapshot map contains an exposure summary that displays the percentage of the population, the improvement and content value of parcels, and the amount of critical infrastructure that is exposed. For hazards without geospatial extents, such as drought and severe weather, narratives are provided instead of exposure maps and tables.

Based on the hazard prioritization exercise, this vulnerability assessment focuses on nine hazards for the City of St. Helena, some of which encompass sub hazards such as Liquefaction and Heavy Rain

Wildfire
SECTION 4.5.2.1



Earthquake
SECTION 4.5.2.2



Flood
SECTION 4.5.2.3



Slope Failure
SECTION 4.5.2.4



Drought
SECTION 4.5.2.5



Dam Failure
SECTION 4.5.2.6



Severe Weather
SECTION 4.5.2.7



Extreme Heat
SECTION 4.5.2.8



Climate Change
SECTION 4.5.2.9



4.5.2.1 Wildfire Hazard

Wildfire risk in the City of St. Helena is primarily concentrated along the eastern and western edges of the community, where developed areas interface with open space, and the Mayacamas Mountains and Howell Mountains. The wildfire risk exposure map, Figure 4-11, shows that portions of the city and surrounding Sphere of Influence are located within Moderate and High Fire Hazard Severity Zones, particularly in areas adjacent to undeveloped land and wildland vegetation.

The eastern boundary of St. Helena, which transitions from the Napa Valley floor to the Howell Mountains near Silverado Trail, is characterized by Very High wildfire hazard. These areas contain dense vegetation on steep slopes that can dry rapidly during summer and fall months, increasing the potential for fast-moving fires under windy or extreme heat conditions. Residential neighborhoods, resorts, and wineries located near this wildland–urban interface (WUI) may face heightened risk related to ember intrusion, evacuation constraints, and access limitations during wildfire events.

High wildfire hazard areas are also present along portions of the City's western edge near the Mayacamas Mountains. Seasonal drying of vegetation and wind conditions can exacerbate localized wildfire risk, particularly during extended drought periods.

The exposure summary associated with the wildfire risk map indicates that, within current mapped hazard areas, there are no permanent residential populations, parcels, or critical infrastructure classified within the Very High Fire Hazard Severity Zone inside city limits. As a result, population exposure, parcel exposure, and critical infrastructure exposure rates within the highest hazard category are reported at 186 persons and 13 parcels. This reflects St. Helena's relatively urbanized development pattern and limited extent of very high-risk wildfire terrain within incorporated boundaries.

Despite the small amount of Very High Fire Hazard Severity Zones within the city, wildfire remains an important planning consideration due to proximity to higher-risk areas outside city limits, regional wildfire activity, and secondary impacts such as smoke exposure, power shutoffs, transportation disruptions, and evacuation demands. Climate change projections indicating hotter temperatures, longer dry seasons, and increased frequency of extreme weather events are expected to exacerbate wildfire conditions throughout Napa County, including areas surrounding St. Helena.

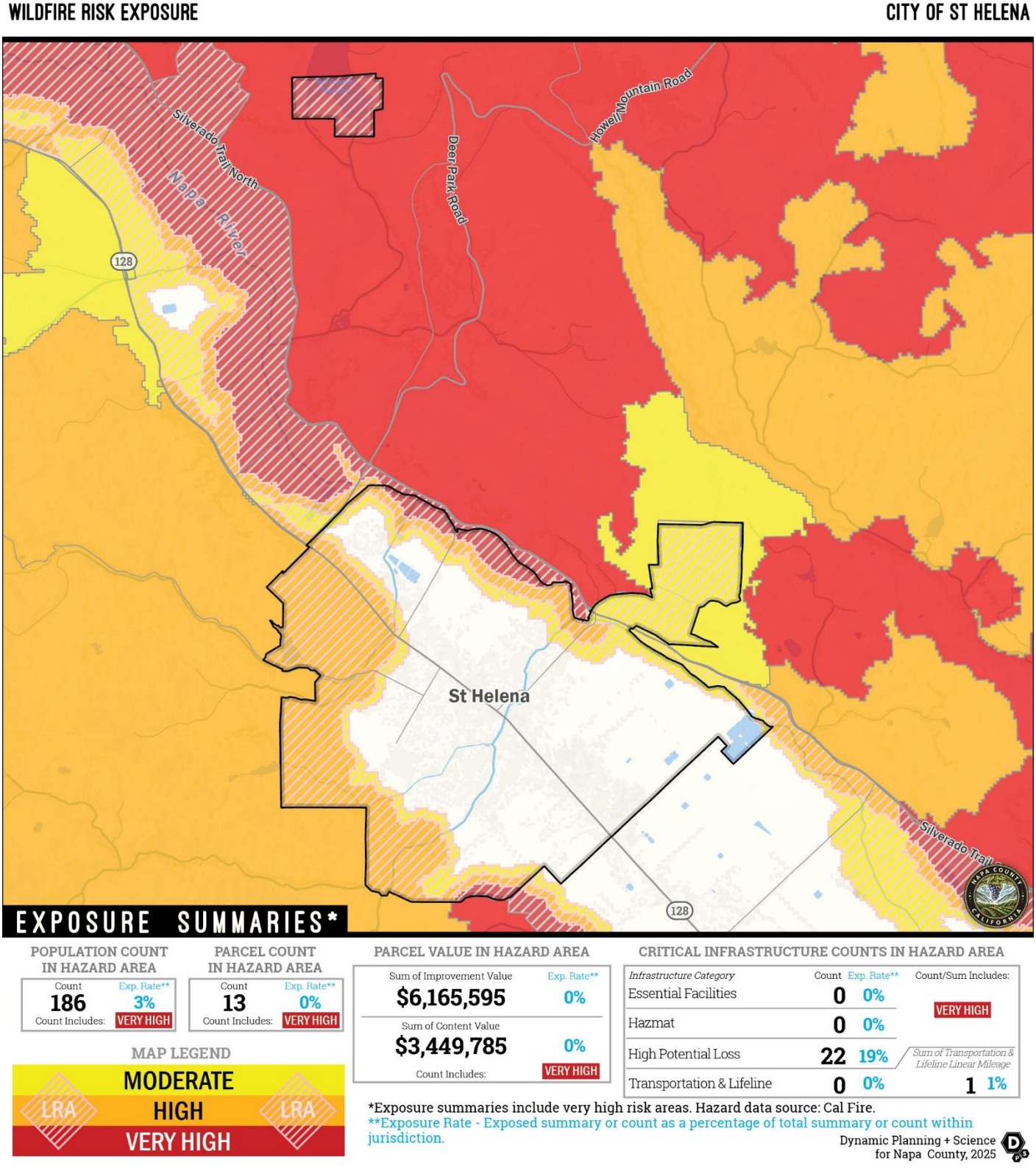


Figure 4-11: Exposure Summary – City of St. Helena Wildfire Risk

4.5.2.2 Earthquake Hazard

The City of St. Helena is subject to significant earthquake risk due to its location within the seismically active San Francisco Bay Area and proximity to multiple active faults in Napa County and the surrounding region. Earthquake impacts in the city are best illustrated through scenario modeling, including the Hunting Creek–Berryessa Earthquake Scenario (Magnitude 7.1) and the West Napa Earthquake Scenario (Magnitude 6.7). These scenarios reflect credible seismic events that could produce strong to severe ground shaking throughout the city.

Under the Hunting Creek–Berryessa M7.1 scenario (Figure 4-12), ground shaking across St. Helena is generally characterized as Strong and Very Strong (Modified Mercalli Intensity [MMI] VI – VII). Exposure summaries indicate that approximately 300 residents, 7 parcels, and nearly $19 million in building improvement value and $7 million in content value fall within these intensity ranges. In addition, all mapped critical infrastructure categories, including essential facilities, hazardous materials sites, high potential loss facilities, and transportation and lifeline systems, are exposed to damaging levels of ground shaking.

The West Napa Earthquake M6.7 scenario, Figure 4-13, represents a less impactful event for St. Helena. Under this scenario, 100 percent of the City's population, parcels, and assessed parcel value are exposed to Strong (MMI VI). Exposure summaries indicate that approximately 200 residents, 200 parcels, and nearly $110 million in building improvement value and $84 million in content value fall within these intensity ranges.

While exposure summaries indicate no population, parcels, or critical infrastructure located in the highest modeled intensity categories for this scenario within city limits, the widespread nature of strong shaking suggests the potential for damage to buildings, infrastructure, and lifelines, particularly older structures and non-ductile construction.

Earthquake impacts associated with these scenarios include structural damage to residential, commercial, and industrial buildings; failure of non-structural components; disruption of transportation corridors such as Highway 29 and Silverado Trail; and damage to utilities including water, wastewater, power, and communications systems.

Secondary earthquake hazards also present a concern for St. Helena. These include hazardous materials releases from industrial and commercial facilities, fires following earthquakes, prolonged power outages, and limited access for emergency response due to damaged roadways or bridges. Given the city's strategic location in the upper Napa Valley, such disruptions could have regional economic and public safety consequences.

Liquefaction

Liquefaction represents a significant secondary earthquake hazard for the City of St. Helena due to local soil conditions, groundwater characteristics, and proximity to the Napa River. Liquefaction occurs when saturated, loose, fine-grained soils temporarily lose strength during intense ground shaking, causing the ground to behave more like a liquid. This phenomenon can result in ground settlement, lateral spreading,

loss of bearing capacity, and damage to buildings, roadways, and buried utilities. While liquefaction is a consideration in hazard mitigation planning, it is not profiled as a standalone hazard but addressed as a secondary earthquake effect.

Areas of St. Helena with higher liquefaction susceptibility are generally located in low-lying portions of the city. These conditions are most prevalent near the Napa River, where shallow groundwater levels increase the likelihood of liquefaction during moderate to strong earthquake shaking (Figure 4-14). In these areas, even structures designed to withstand seismic forces may experience damage if foundations or supporting soils lose stability.

Liquefaction can significantly amplify earthquake impacts by damaging lifeline infrastructure such as water, wastewater, storm drainage, gas, and telecommunications systems. Buried pipelines may rupture or become misaligned, roadways and bridges may settle or deform, and access routes needed for emergency response may be compromised. Industrial and commercial areas located on susceptible soils may face additional risks related to hazardous materials releases if tanks, pipelines, or containment systems are affected.

The earthquake scenario analyses for St. Helena indicate that strong to very strong ground shaking (MMI VII–VIII) is likely under credible seismic events. When combined with local liquefaction-prone soils, these shaking intensities increase the potential for widespread ground failure in susceptible areas. As a result, liquefaction poses a threat not only to individual structures but also to the city's broader functionality and recovery following a major earthquake.

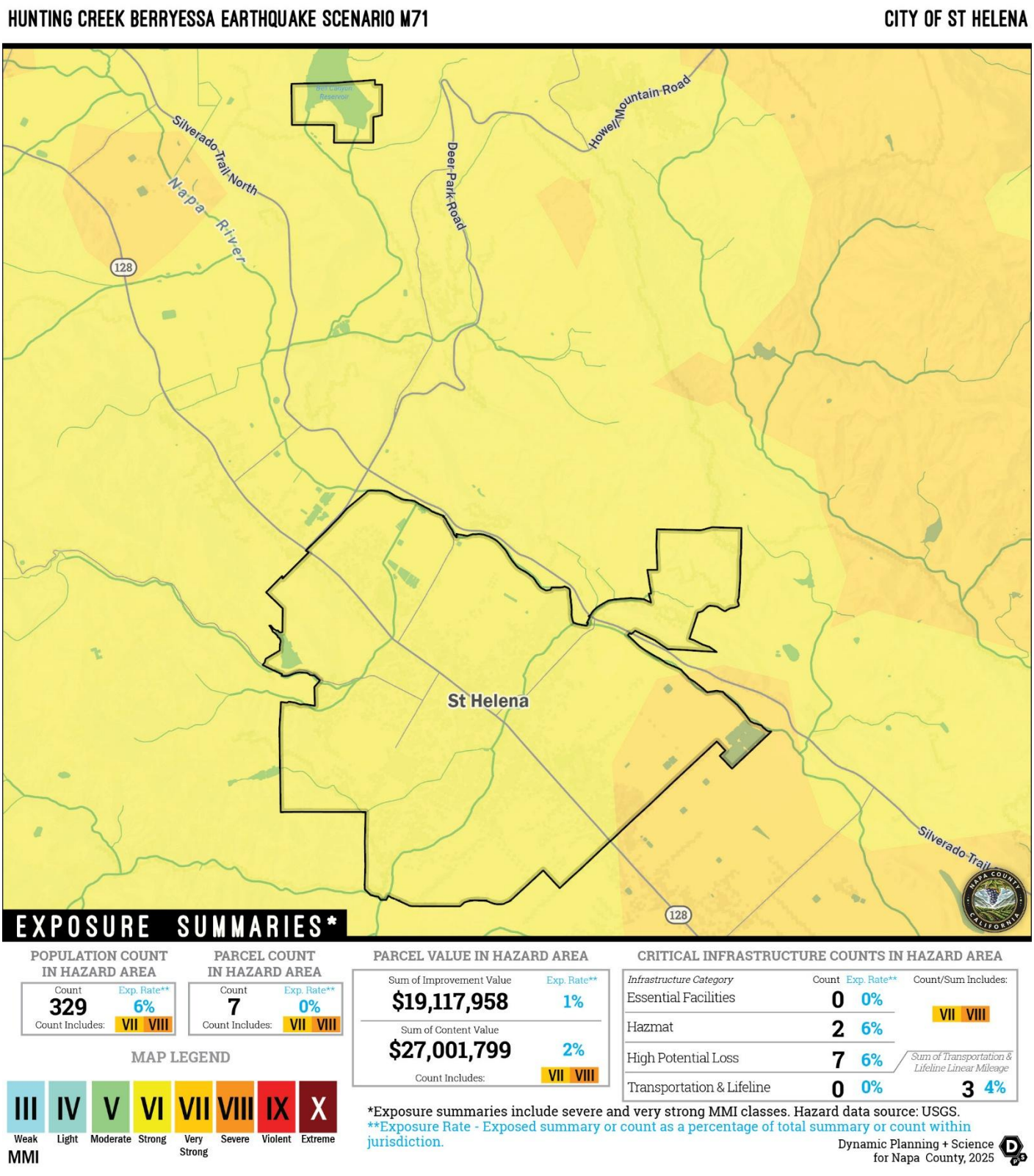


Figure 4-12: Exposure Summary – City of St. Helena Earthquake Risk (M7.1 Hunting Creek–Berryessa)

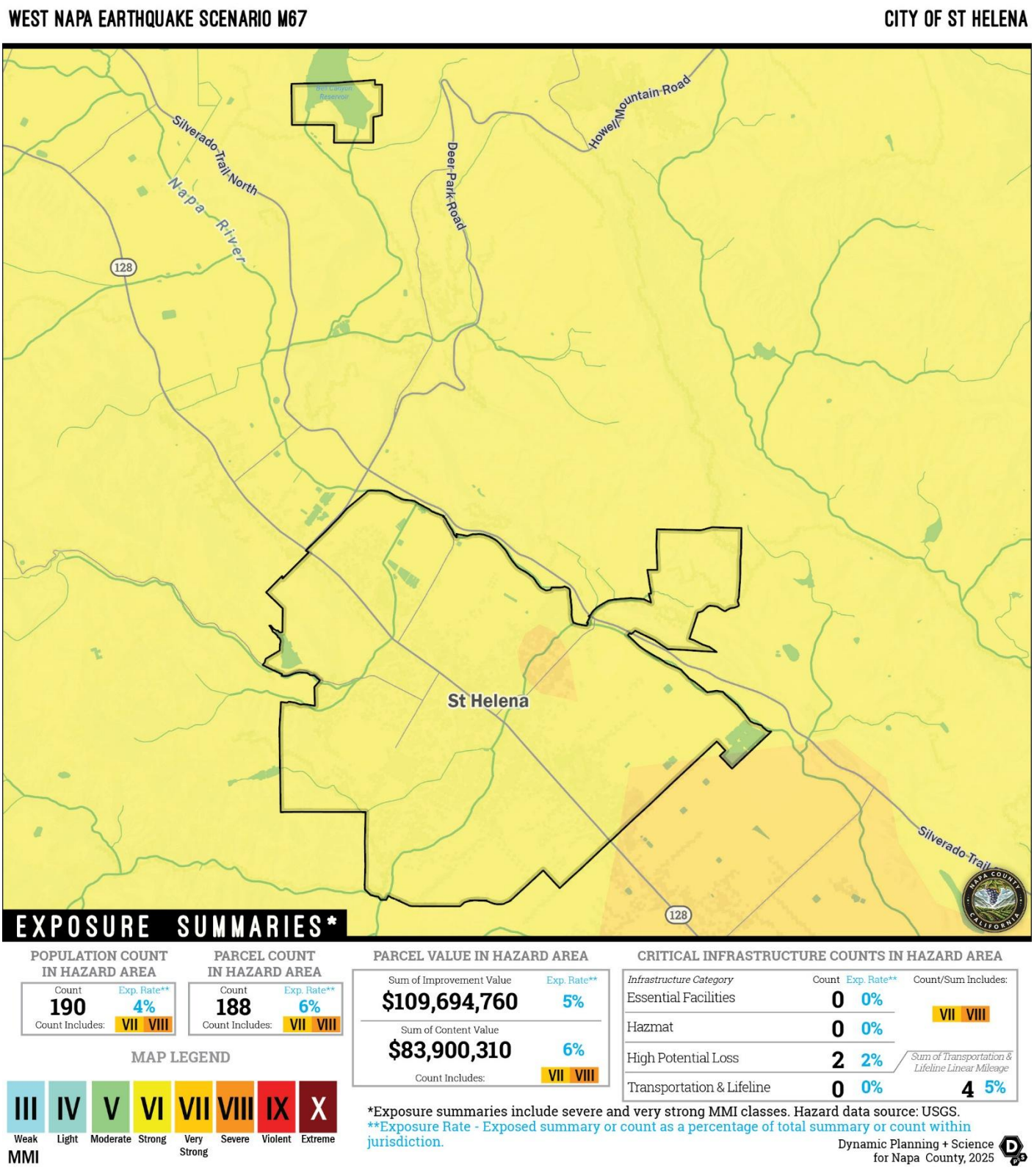


Figure 4-13: Exposure Summary – City of St. Helena Earthquake Risk (M6.7 West Napa)

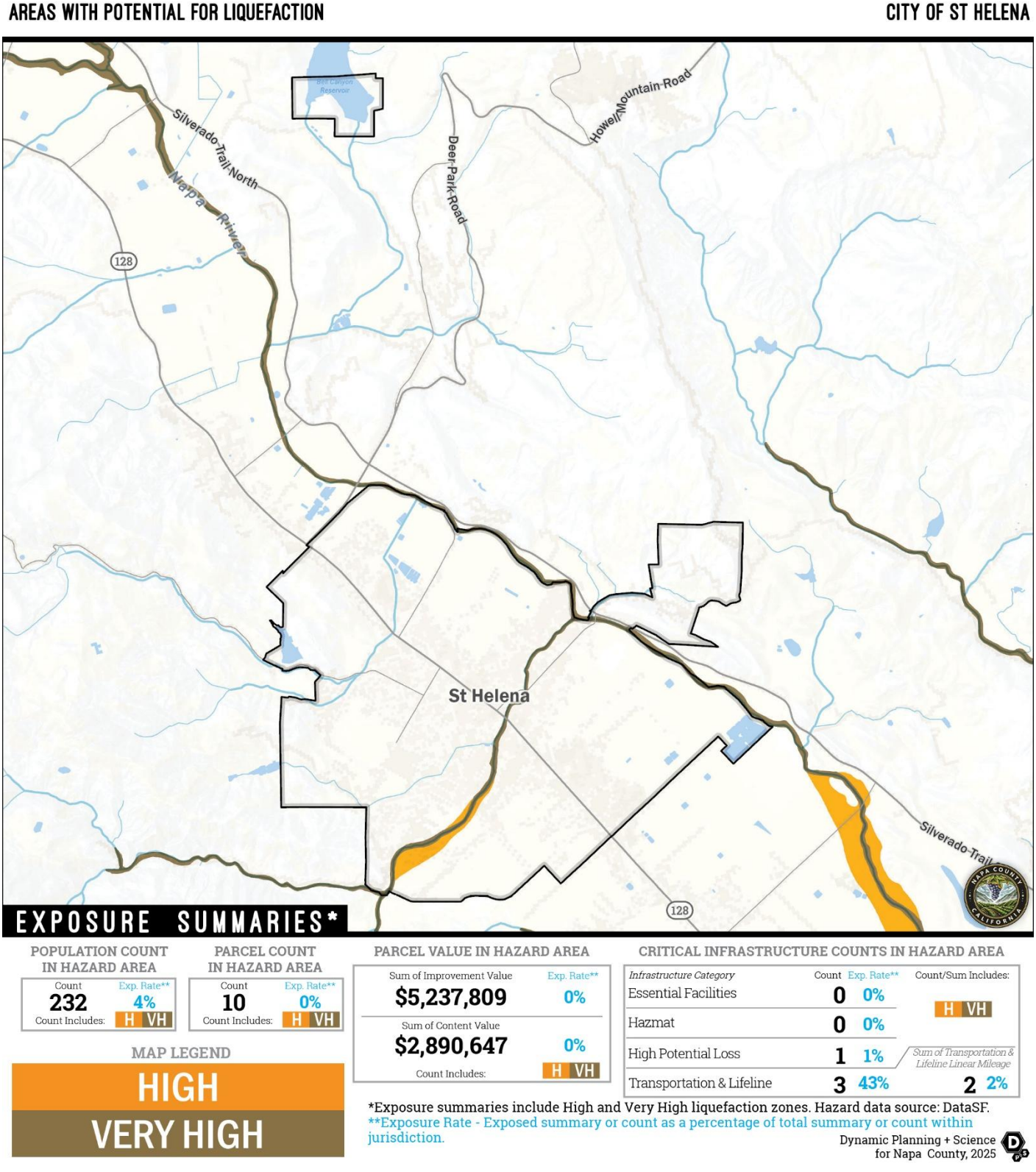


Figure 4-14: Exposure Summary – City of St. Helena Liquefaction Risk

4.5.2.3 Flood Hazard

Flooding is a significant natural hazard for the City of St. Helena due to its location on the Napa River. Portions of the City are subject to riverine flooding, particularly during major precipitation events. Flood hazard areas within St. Helena are primarily concentrated along the Napa River, as well as along localized drainage corridors.

The FEMA Flood Risk Exposure map, Figure 4-16, shows areas within the 100-year (1-percent annual chance) and 500-year (0.2-percent annual chance) floodplains, including mapped floodway areas and zones protected by levees. These flood-prone areas reflect the combined influence of river overflow and constrained drainage capacity. Flood hazards in these areas may be exacerbated during extreme storm events.

Exposure analysis indicates that approximately 725 residents are located within mapped flood hazard areas. In addition, over 500 parcels are exposed to flooding, with an estimated $166 million in building improvement value. A small number of essential facilities or hazardous materials sites are located within the mapped flood hazard areas and several transportation and lifeline facilities intersect flood-prone zones, highlighting the potential for access disruptions and service interruptions during flood events.

Flooding in St. Helena can result in structural damage to buildings, roadway inundation, utility system impacts, and long-term economic disruption. Repetitive or prolonged flooding may also affect industrial and commercial areas near the river, compounding recovery challenges. Secondary impacts include erosion, sediment deposition, and degradation of wetlands and shoreline infrastructure.

Climate change is expected to increase flood risk in St. Helena over time. Projections for more intense precipitation events may expand flood extents, increase flood depths, and reduce the effectiveness of existing levees and drainage systems. Areas currently mapped within the 500-year floodplain may experience more frequent flooding in the future, increasing exposure to residents, infrastructure, and economic assets.

National Flood Insurance Program

The National Flood Insurance Program (NFIP) makes federally backed flood insurance available to homeowners, renters, and business owners in participating communities. FEMA has prepared a detailed Flood Insurance Study (FIS) for Napa County and municipalities. The study presents water surface elevations for floods of various magnitudes, including the 1% annual chance flood (100-YR flood) and the 0.2% annual chance flood (500-YR flood). Base flood elevations and the boundaries of the 100- and 500-YR floodplains are shown on Flood Insurance Rate Maps (FIRMs), which are the principal tools for identifying the extent and location of the flood hazard. FIRMs are the most detailed and consistent data source available, and for many communities they represent the minimum area of oversight under their floodplain management program. See Section 4 of Volume 1 for general information on the NFIP.

The City of St. Helena has participated in the NFIP since 1980 and has adopted the most recent FIRMs and FIS issued by FEMA (dated September 26, 2008) as well as local floodplain development regulations in

compliance with the minimum NFIP standards (St. Helena Municipal Code Chapter 15.52). These minimum standards include procedures and provisions for substantial improvements and substantial damages to existing structures, the latter of which are employed by the floodplain administrator and city building inspectors following any hazard event affecting structures located in the flood hazard area in accordance with NFIP requirements. Regulations for substantial improvements are enforced via permitting procedures. Implementation and enforcement of the city's floodplain regulations are assigned to the floodplain administrator.

The City of St. Helena is currently in good standing with the provisions of the NFIP. Compliance is monitored by FEMA regional staff and by the California Department of Water Resources under a contract with FEMA. Maintaining compliance under the NFIP is an important component of flood risk reduction. See Table 4-12 for more information on the City's policies and historic flood insurance claims.

Table 4-12: City of St. Helena National Flood Insurance Program Information

City of St. Helena NFIP Status and Flood Insurance Statistics	
NFIP Status	Participating Since 5/01/1980
Community Identification (CID)	060208
CRS Class (Entry Date)	N/A
Policies in Force (Total Coverage)	47 Policies ($18,477,000 Coverage)
Policies Inside SFHA / Outside SFHA	Inside 26 / 21 Outside
Policies in Coastal Zones (Total Coverage)	N/A
Total Claims (Total Paid)	51 Claims ($1,789,688 Paid)
Repetitive Loss (RL) / Severe Repetitive Loss (SRL) Properties	12 RL / 0 SRL
Repetitive Loss Payments	$671,596

Note: The number of policies is by property and does not count policies for individual buildings. The Privacy Act of 1974 (5 USC 522a) restricts the release of certain types of data to the public. Flood insurance policy and claims data is included in the list of restricted information. FEMA can only release such data to state and local governments, and only if the data is used for floodplain management, mitigation, or research purposes. Therefore, this plan does not identify the repetitive loss properties or include claims data for any individual property.

Principal Flooding Sources

The principal flooding source for the City of St. Helena is the Napa River and its tributaries. Riverine flooding from the Napa River and its tributaries is the primary driver of mapped flood risk in St. Helena. During major storm events, high river flows can overtop banks or exceed channel capacity.

Localized flooding from creeks, drainage channels, and stormwater systems occurs within the city but generally represents a secondary source compared to the riverine flooding associated with the Napa River system.

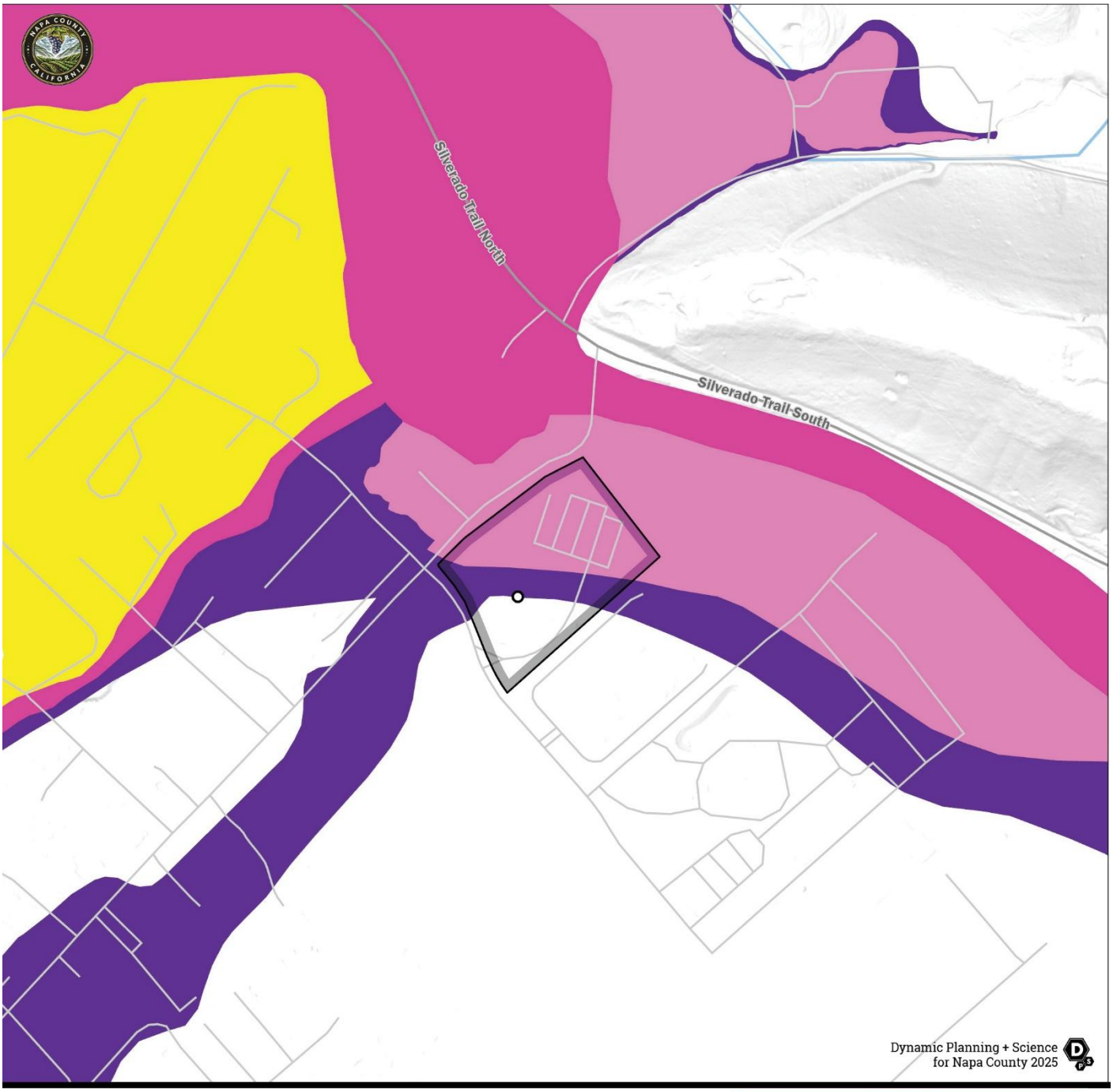


Figure 4-15: City of St. Helena Flood Risk (FEMA Zones and DWR Awareness Zone)

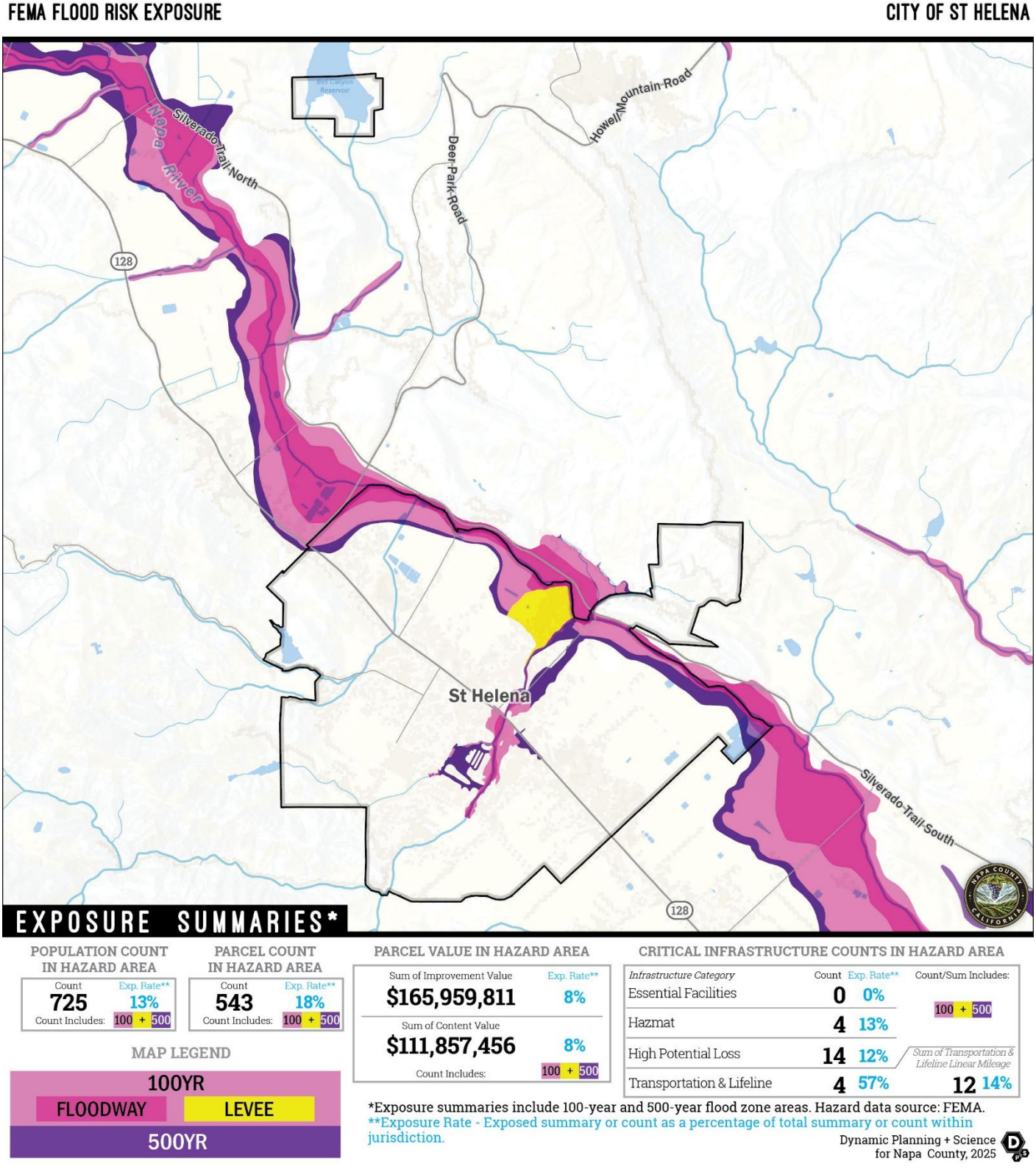


Figure 4-16: Exposure Summary – City of St. Helena Flood Risk (FEMA Zones)

4.5.2.4 Slope Failure

Slope failure, including landslides, debris flows, and earth movement, poses a localized but notable hazard for the City of St. Helena due to the presence of steep terrain along the western and eastern edges of the city.

The Landslide Risk Exposure map, Figure 4-17, based on data from the California Geological Survey, identifies areas of moderate and high landslide susceptibility. High-susceptibility areas are concentrated outside the City's urban core, particularly in undeveloped or sparsely developed hillside terrain. These areas are more prone to slope failure during periods of prolonged or intense rainfall, which can saturate soil and reduce slope stability.

Exposure analysis indicates that slope failure risk affects a relatively small portion of St. Helena's developed areas. Approximately 500 residents and 50 parcels are located within mapped high-susceptibility zones, with an estimated $90 million in building improvement and $60 million in contents value exposed. Only three essential facilities, hazardous materials sites, high potential loss facilities, or major transportation and lifeline infrastructure are located within high-risk slope failure areas, limiting the potential for widespread community impacts.

Although overall exposure is limited, slope failure events can still result in localized damage to structures, roadways, and utilities, particularly where development occurs near steep slopes or drainage channels. Landslides may also block access routes, disrupt emergency response, and increase sediment loads in downstream waterways. In addition, slope instability can be triggered or exacerbated by earthquake shaking, compounding risks during major seismic events.

Climate change may increase slope failure risk over time by contributing to more intense storm events and longer periods of soil saturation. Hillside areas around St. Helena may experience increased erosion and slope movement under these conditions, emphasizing the importance of proactive planning and monitoring.

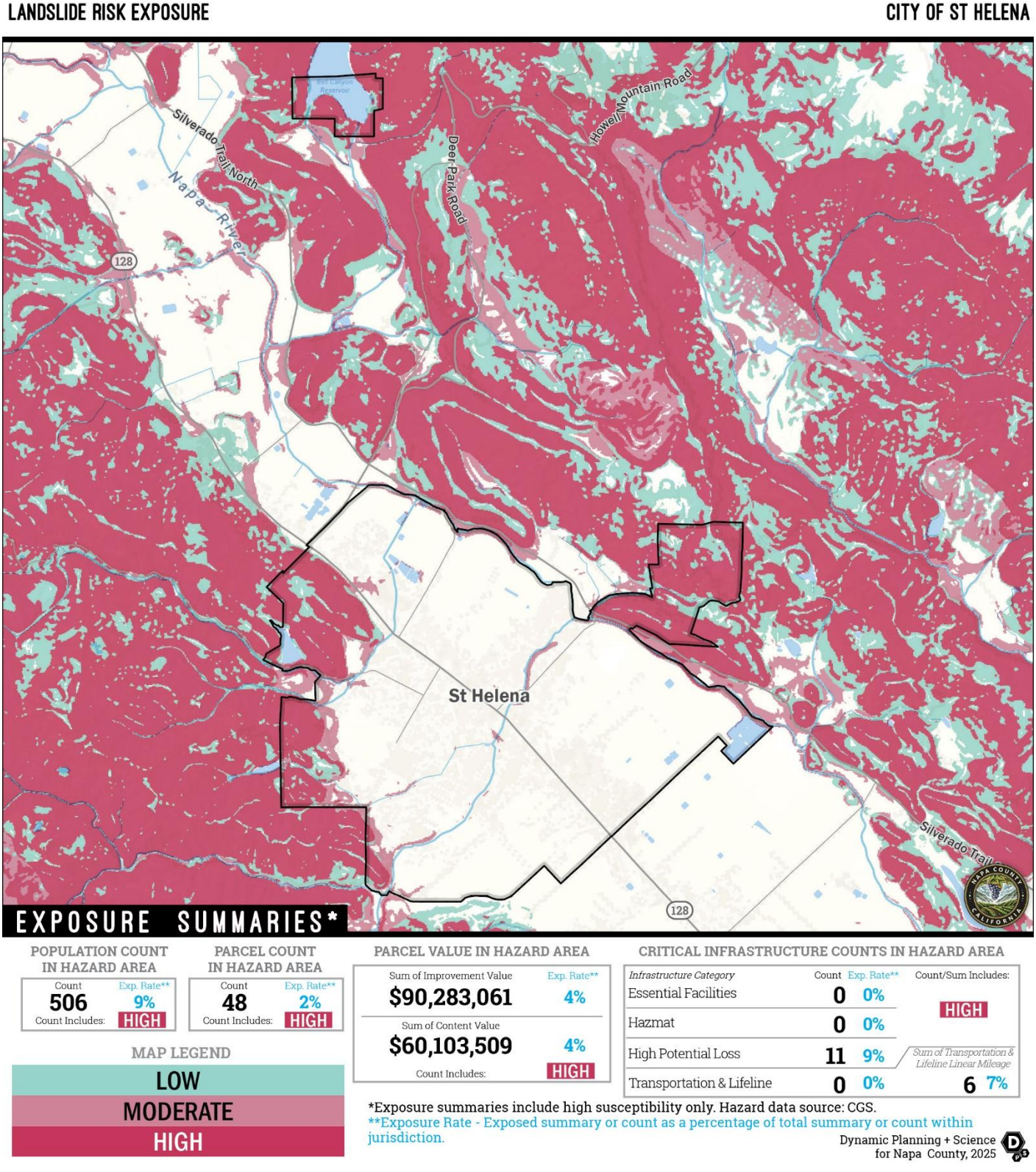


Figure 4-17: Exposure Summary – City of St. Helena Slope Failure Risk

4.5.2.5 Drought Hazard

The National Drought Monitor provides drought data and maps nationally and on a localized, watershed scale. The National Drought Monitor is the product of 11 agencies, including the NDMC, NOAA and USDA, and is available at http://droughtmonitor.unl.edu/. The National Drought Monitor categorizes the level of drought from D0 through D4, with D4 being the highest "exceptional drought." Table 4-13 depicts drought classifications and impacts from the level of drought occurrence in California, while Figure 4-18 shows a time series of the level of drought in Napa County from 2000 to 2025 according to the National Drought Monitor.

Drought is a recurring and long-term hazard for the City of St. Helena due to California's Mediterranean climate, variable precipitation patterns, and increasing impacts from climate change. Periods of prolonged below-average rainfall, reduced snowpack in the Sierra Nevada, and higher temperatures can significantly affect regional water supplies, ecosystems, and community resilience. Although drought does not typically cause immediate physical damage like other hazards, its cumulative impacts can be widespread and long-lasting.

St. Helena relies on a combination of surface water and imported water supplies that are vulnerable to regional drought conditions. Extended drought periods can reduce available water supplies, increase demand during hotter and drier conditions, and place stress on water delivery systems. Drought conditions may also require implementation of mandatory water conservation measures, affecting residents, businesses, landscaping, and industrial operations.

Drought can exacerbate other natural hazards affecting St. Helena. Dry conditions increase vegetation stress and fuel loads, elevating wildfire risk in surrounding grasslands and open space areas. Reduced soil moisture can also contribute to land subsidence, soil instability, and increased erosion during subsequent storm events. In addition, drought can degrade wetlands and riparian habitats along the Napa River and bayfront, reducing their natural flood attenuation and ecological functions.

Economic impacts of drought may include increased operational costs for businesses, reduced agricultural productivity in the surrounding region, and higher household expenses related to water use restrictions or rate adjustments. Vulnerable populations, including low-income households and elderly residents, may be disproportionately affected by higher utility costs and reduced access to cooling and water resources during extreme heat events associated with drought.

Climate change projections indicate that drought conditions in California are likely to become more frequent and severe, with longer dry periods punctuated by fewer but more intense storm events. These trends increase uncertainty in water supply reliability and place additional importance on long-term water resource planning, conservation, and resilience measures.

Table 4-13: Drought Classifications and Impacts

Category	Description	Possible Impacts
D0	Abnormally Dry	▪ Soil is dry; irrigation delivery begins early ▪ Dryland crop germination is stunted ▪ Active fire season begins
D1	Moderate Drought	▪ Dryland pasture growth is stunted; producers give supplemental feed to cattle ▪ Landscaping and gardens need irrigation earlier; wildlife patterns begin to change ▪ Stock ponds and creeks are lower than usual
D2	Severe Drought	▪ Producers increase water efficiency methods and drought-resistant crops ▪ Grazing land inadequate ▪ Fire season is longer, with high burn intensity, dry fuels, and large fire spatial extent, more fire crews on staff ▪ Lake- and river-based tourism declines; boat ramps close ▪ Trees are stressed; plants increase reproductive mechanisms; wildlife diseases increase ▪ Water temperatures increase; programs to divert water to protect fish begin ▪ River flows decrease; reservoir levels are low and banks are exposed
D3	Extreme Drought	▪ Federal water is not adequate to meet irrigation contracts; extracting supplemental groundwater is expensive ▪ Fire season lasts year-round; fires occur in typically wet parts of the state; burn bans are implemented ▪ Ski and rafting business are low; mountain communities suffer ▪ Low water levels impede fish migration and cause lower survival rates ▪ Wildlife encroaches on developed areas; little native food and water is available for bears, which hibernate less ▪ Water sanitation is a concern; reservoir levels drop significantly; surface water is nearly dry; flows are very low; water theft occurs ▪ Livestock need supplemental feed, cattle and horses are sold; little pasture remains ▪ Well and aquifer levels decrease; homeowners drill new wells
D4	Exceptional Drought	▪ Fire season is very costly; number of fires and areas burned are extensive ▪ Many recreational activities are affected ▪ Fields are left fallow; orchards are removed; vegetable yields are low; honey harvest is small; agricultural unemployment is high, food aid is needed ▪ Fish rescue and relocation begin; pine beetle infestation occurs; forest mortality is high; wetlands dry up; wildlife death is widespread; algae blooms appear ▪ Poor air quality affects health: greenhouse gas emissions increase as hydropower production decreases; West Nile outbreaks rise ▪ Water shortages are widespread; surface water is depleted; federal irrigation water deliveries are curtailed; water prices are extremely high; wells are dry, more and deeper wells are drilled; water quality is poor

Source: Adapted from U.S. Drought Monitor Drought Classifications and Impacts

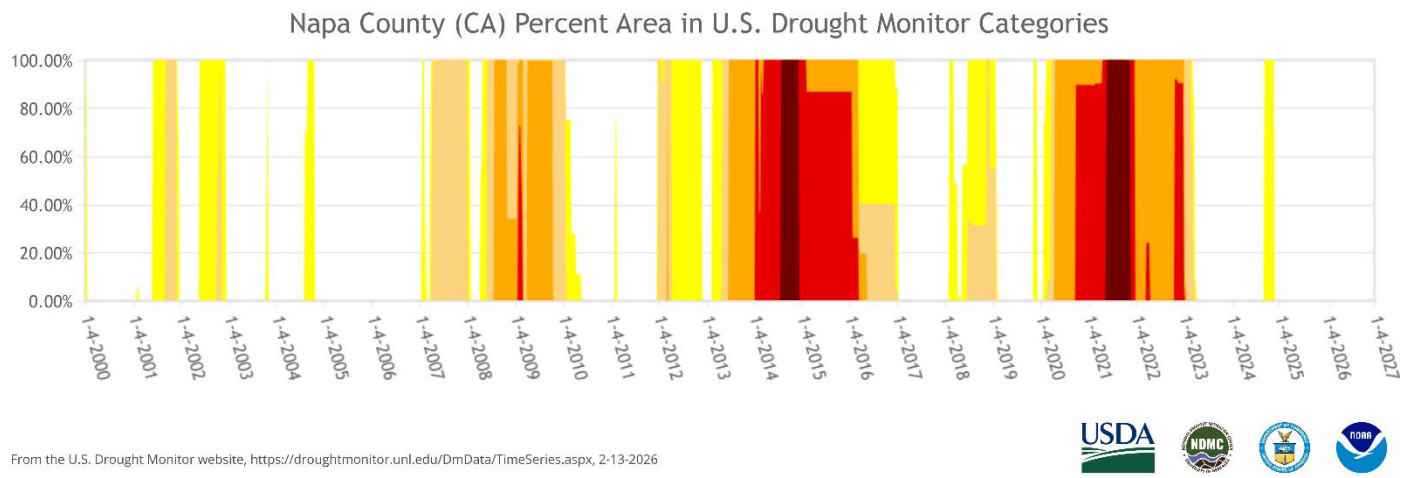


Figure 4-18: Drought Severity Timeline 2000-2024

4.5.2.6 Dam Failure

Dam failure is a lower-probability but high-consequence hazard for the City of St. Helena due to its downstream location from several reservoirs. Dam failure refers to the partial or complete structural failure of an upstream dam, resulting in the uncontrolled release of stored water. Although there are no major dams located within St. Helena city limits, failure of an upstream dam could generate rapid downstream flooding affecting portions of the city.

Potential causes of dam failure include extreme precipitation events that exceed design capacity, seismic activity, internal erosion or piping, slNope instability, aging infrastructure, or operational issues. Earthquakes are a particular concern in Napa County, where strong ground shaking could compromise dam embankments, spillways, or outlet works. Climate change may also increase stress on dam systems by intensifying storm events and altering hydrologic conditions.

Dam failure events differ from typical riverine flooding in that floodwaters may arrive with little warning, high velocity, and significant destructive force, greatly increasing risks to life safety, structures, transportation corridors, and utilities. Because warning times may be limited, emergency preparedness, public awareness, and evacuation planning are critical components of risk reduction.

Dam safety oversight, inspection, and emergency action planning are managed at the state and regional levels, including by the California Department of Water Resources and the California Division of Safety of Dams. These agencies work with dam owners and local jurisdictions to monitor dam conditions and coordinate emergency notification procedures.

Dam inundation describes the geographic areas that could be flooded as a result of a dam failure upstream. Inundation mapping identifies where floodwaters would travel and accumulate if a failure were to occur.

The Dam Inundation Exposure map, Figure 4-19, shows that inundation zones in St. Helena are primarily concentrated along the western portion of the city near the Napa River corridor and other low-lying terrain. These areas reflect natural flow paths where floodwaters would be conveyed downstream under a dam failure scenario.

Exposure analysis indicates that approximately 600 residents and close to 100 parcels fall within these areas, with an estimated $94 million in building improvement value and $83 million in contents value exposed. Several high-potential-loss facilities and transportation and lifeline facilities are also located within inundation zones, underscoring the potential for service disruptions and access limitations during a dam-related flood event.

Dam inundation flooding can result in deep, fast-moving water capable of causing severe structural damage, roadway washouts, utility failures, and long-term economic disruption. Because these areas may experience flooding rapidly following a dam failure, evacuation and emergency response may be challenging, particularly in locations with limited access routes.

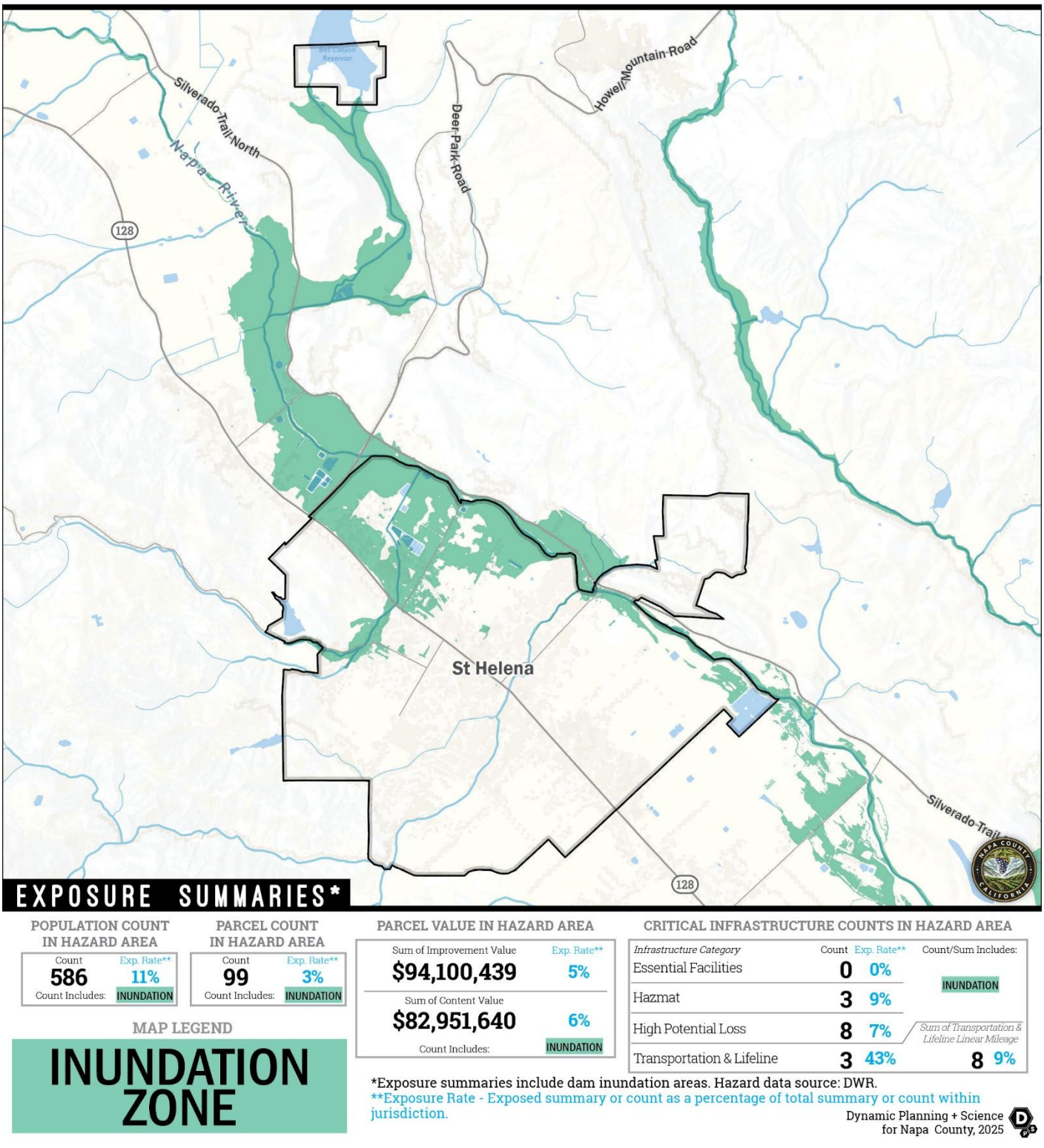


Figure 4-19: Exposure Summary – City of St. Helena Dam Inundation Zone

4.5.2.7 Severe Weather Hazard

Severe storms are a recurring hazard in St. Helena, typically driven by high winds, heavy rainfall, and atmospheric river events during the winter months. While tornadoes, hail, and snow are rare in the region, severe storm impacts can be significant due to the city's vulnerable infrastructure, older housing stock, and concentrations of at-risk populations.

Residents in mobile homes and older housing, many of whom are low-income or elderly, are particularly vulnerable during storm events. These households face heightened risks from power outages, mobility limitations, and health impacts during prolonged high-wind or heavy-rain events.

High winds frequently cause downed trees and power lines in and around St. Helena, leading to widespread power outages, communication disruptions, and blocked roadways. Such conditions strain emergency response capabilities, delay evacuations, and exacerbate challenges for dependent populations.

Heavy rainfall during atmospheric river events can overwhelm St. Helena's aging stormwater infrastructure, especially in older downtown areas and low-lying neighborhoods near culverts and sloughs. These localized flash floods result in hazardous road conditions, temporary isolation of neighborhoods, and damage to property and infrastructure.

Severe storm frequency and intensity are projected to increase because of climate change. St. Helena already faces winter storms and recurring atmospheric rivers, which are contributing to repeated road closures, localized flooding, and long-term infrastructure strain. Climate-driven changes to storm severity highlight the city's continued vulnerability to cascading hazards, including flooding and slope instability along the slough system.

While severe storms in St. Helena may not produce catastrophic destruction, their compounding effects on vulnerable populations, lifeline infrastructure, and mobility make them a critical hazard for ongoing mitigation planning. Strategies to reduce risk should prioritize hardening power and drainage systems, enhance stormwater infrastructure, and develop targeted preparedness and response measures that reach the city's most at-risk residents.

4.5.2.8 Extreme Heat Hazard

The City of St. Helena's inland valley location and reliance on outdoor agricultural labor make it particularly sensitive to rising temperatures and more frequent extreme heat days. While the bay influence of San Pablo Bay provides some natural moderation, climate change is projected to increase both the frequency and intensity of heat waves in the region, posing growing risks to public health, agriculture, and infrastructure.

The frequency of extreme heat days is projected to rise significantly across inland Napa County by mid-century. By the end of the century, the number of warm nights—when temperatures remain elevated and prevent recovery from daytime heat—is also projected to increase dramatically.

Heat waves are becoming more common across California, with projections showing a significant rise in the number of extreme heat days by mid-century. In St. Helena, outdoor agricultural workers face elevated risks during extreme heat events, particularly those without access to shaded rest areas, cooling stations, or protective equipment. Seniors, low-income residents, and individuals in older housing stock without air conditioning are also especially vulnerable to heat-related illness and may lack transportation to reach cooling centers. In addition, the city can experience power outages due to heat events and increased demand on the grid during peak hours.

According to Cal-Adapt, St. Helena will likely experience a climate change-driven increase in extreme heat days from four days per year to 18 days per year by the end of the century under a medium emissions scenario (RCP 4.5). Over the same time period, the city is also likely to see an increase in warm nights from four per year to 36. Table 4-14 explains the extreme heat event thresholds for St. Helena.

Table 4-14: Cal-Adapt Extreme Heat Thresholds

Term	Cal-Adapt Definition	Thresholds for City of St. Helena
Extreme Heat Day	Defined as a day in a year when the daily maximum/minimum temperature exceeds the 98th percentile of daily maximum/minimum temperatures based on observed historical data from 1961-1990 between April and October.	**101.3°F**
Warm Night	Defined as a day in April through October when daily minimum temperature exceeds the 98th historical percentile of daily minimum temperatures, based on observed data from 1961-1990 between April and October.	**63.3°F**
Heat Wave	Defined as four consecutive days or nights above the extreme heat / warm night threshold.	**3 days ≥ 101.3°F** or **4 nights ≥ 63.3°F**

Source: Cal-Adapt Extreme Heat Days and Warm Nights Tool

For St. Helena, this means disproportionate impacts on its agricultural workers as well as low-income households with limited adaptive capacity. Further, with almost 40% of the population over 65 years and a significant percentage of people living with disabilities, much of the St. Helena community may be susceptible to extreme heat impacts.

Extreme heat often coincides with elevated wildfire risk, reduced air quality from ozone and particulates, and public safety power shutoffs designed to prevent utility-caused ignitions. These secondary hazards can compound vulnerabilities by cutting access to cooling or disrupting medical care reliant on electricity.

4.5.2.9 Climate Change Hazard

Average annual temperatures across most of California have already increased by more than 1°F, with some areas experiencing rises of over 2°F when comparing the 1901 to 1960 average to that of 1986 to 2016. Daily

maximum temperatures—a key indicator of extreme heat—are projected to increase by 4.4°F to 5.8°F by 2050 and by 5.6°F to 8.8°F by 2100. Heat waves that impact public health, known as heat-health events, are also expected to intensify across the state. By 2050, these events are projected to last up to two weeks longer in the Central Valley and occur four to ten times more often in the Northern Sierra region (California Natural Resources Agency, 2022).

California is already experiencing significant impacts from climate change, including prolonged drought, a lengthened wildfire season, increased coastal flooding and erosion, and widespread tree mortality. The state has observed rising average temperatures, more extreme heat days, fewer cold nights, a longer growing season, and shifts in the water cycle, with less winter precipitation falling as snow. In addition, summertime fog has declined by approximately 33%, and both snowmelt and rainwater runoff are occurring earlier in the year (Cal OES, 2018).

Long-term trends indicate a 12% to 20% decline in fog across California from 1900 through projections to 2070. Climate experts suggest that warming temperatures reduce the ability of air masses to cool enough to produce fog, which plays a critical role in supporting California's ecosystems (Grantham, Teodore; University of California, Berkeley, 2018).

The City of St. Helena is increasingly vulnerable to the long-term impacts of climate change, which function as hazard multipliers across the Napa Valley and broader North Bay region. St. Helena's location within an inland valley, combined with its proximity to San Pablo Bay and surrounding upland areas, creates a complex climate setting that is sensitive to shifts in temperature, precipitation patterns, and seasonal variability. Projected changes in these conditions are expected to intensify existing hazards, including flooding, severe weather, drought, and wildfire.

Precipitation, Storms & Flooding

Although total annual precipitation may not significantly increase, climate projections indicate that rainfall is more likely to occur in fewer, more intense storm events. These high-intensity storms, often associated with atmospheric river systems, increase the risk of riverine flooding along the Napa River as well as localized flooding in urban areas with constrained drainage systems.

Intense rainfall following extended dry periods can also increase the risk of erosion, localized slope instability, and debris flows, particularly in hillside areas surrounding the valley floor and along transportation corridors. These conditions can impact critical infrastructure, damage roadways, and disrupt emergency access. In addition, sea level rise combined with higher peak flows in the Napa River and its tributaries may exceed existing system capacity during extreme events, contributing to flooding beyond currently mapped floodplain boundaries.

Drought & Water Reliability

Climate change is expected to result in more frequent and prolonged drought conditions across Napa County. While the City of St. Helena benefits from a combination of local and regional water sources, extended dry periods can reduce water availability, increase demand, and place stress on both surface water

and groundwater systems. Reduced precipitation and earlier snowmelt in upstream watersheds may affect reservoir storage and seasonal water supply reliability.

Drought conditions also have broader environmental and hazard implications. Reduced soil moisture and vegetation stress increase susceptibility to wildfire in surrounding areas, while also affecting urban landscaping and tree canopy health within the city. Prolonged dry conditions may also impact local creeks and riparian systems, which play an important role in stormwater conveyance, habitat, and groundwater recharge.

Wildfire & Vegetation Change

Climate-driven increases in temperature and changes in precipitation patterns are expected to extend the wildfire season and increase fire risk in areas surrounding the City of St. Helena. While much of the city is urbanized, it is bordered by wildland and open space areas that are susceptible to wildfire. Fires in surrounding areas can affect the city through evacuation impacts, degraded air quality, and strain on emergency services.

Changes in vegetation patterns, including increased tree mortality and shifts in species composition, may contribute to higher fuel loads over time. Even when wildfire does not directly impact the city, smoke and poor air quality can have significant public health consequences, particularly for sensitive populations.

Cascading Effects

Climate change amplifies interactions between hazards, creating compounding risks for the City of St. Helena. These cascading effects underscore the importance of integrating climate considerations into hazard mitigation planning, infrastructure investment, emergency preparedness, and community outreach. As climate conditions continue to evolve, proactive planning will be critical to reducing long-term risk and enhancing community resilience.

4.5.3 Climate Change Impacts & Vulnerable Populations

Climate change is expected to exacerbate many of the natural hazards affecting the City of St. Helena, increasing risks to populations that already face social, economic, or physical vulnerabilities. Rising temperatures, more extreme precipitation events, prolonged drought, sea level rise, and increased frequency of extreme heat are projected to intensify existing hazard conditions and create new challenges for public health, safety, and emergency response.

Certain populations in St. Helena are more likely to experience disproportionate impacts from climate-related hazards. Older adults, individuals with disabilities, low-income households, renters, and households with limited English proficiency may have reduced capacity to prepare for, respond to, and recover from climate-driven events. These groups may face barriers related to mobility, access to transportation, financial resources, housing stability, or timely access to emergency information.

Extreme heat presents a growing risk to vulnerable populations, particularly elderly residents, individuals with underlying health conditions, outdoor workers, and households without adequate cooling. Heat waves can increase the incidence of heat-related illness, strain electrical systems, and worsen air quality, especially when combined with wildfire smoke. Low-income households may be less able to afford cooling costs or make energy-efficient upgrades, increasing exposure during prolonged heat events.

Flooding and sea level rise disproportionately affect residents and workers in flood prone areas near the Napa River. Vulnerable populations living or working in these areas may face greater risk of displacement, property damage, and disruption of access to essential services. Flood events can also impact transportation routes and utilities, creating additional challenges for individuals who rely on public transit, medical equipment, or nearby services.

Drought and water scarcity can place added burdens on vulnerable populations by increasing utility costs, limiting access to cooling and landscaping, and reducing the resilience of natural systems that provide flood protection and cooling benefits. For low-income households and fixed-income seniors, increased water and energy costs associated with drought and heat can compound financial stress.

Climate change may also increase the frequency and duration of poor air quality events, particularly from regional wildfires. Individuals with respiratory conditions, older adults, children, and outdoor workers are especially sensitive to smoke exposure. Limited access to air filtration, clean indoor environments, or protective equipment can further increase health risks for vulnerable populations.

4.5.4 Hazard Problem Statements

As part of the mitigation action identification process, the Planning Team for each jurisdiction identified areas of concern (aka problem statements) for their respective facilities based on the risk assessment and vulnerability analysis, utilizing the RAMP mapping and static snapshot maps. Problem statements focused on the impact, victim, or threat that the hazard could create in the jurisdiction, as described in Table 4-15. Identifying common issues and weaknesses through these problem statements assisted the planning group in understanding the realm of resources needed for mitigation.

The goal is to have at least one mitigation action for every problem statement. Projects or actions have been developed to mitigate each problem identified. See Table 4-17 for a full list of mitigation actions and corresponding problem statements that they address. Each problem statement is coded with a problem number for cross-referencing between Table 4-15 and Table 4-17

Table 4-15: City of St. Helena Hazard Problem Statements

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-CC-SH-329	Climate Change	Threat	**City of St. Helena**	Climate change is expected to increase the frequency and intensity of existing hazards, amplifying the impacts of extreme heat, drought, severer weather, wildfire, and flood.	ma-AH-SH-7, ma-AH-SH-8, ma-AH-SH-9, ma-DR-SH-29, ma-FL-SH-71, ma-WF-SH-103

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-DF-SH-27	Dam Failure	Victim	**City of St. Helena**	There are almost 600 residents and hundreds of parcels exposed to dam inundation associated with Bell Canyon and other upstream dams, creating life-safety and service disruption risks in St. Helena.	ma-FL-NCo-52, ma-FL-NCo-56, ma-DF-NCo-120, ma-DF-SH-222, ma-FL-SH-71
ps-DF-SH-330	Dam Failure	Impact	**City of St. Helena**	Dam failure could damage or disrupt several critical facilities, including key transportation routes, water and wastewater infrastructure, and electric systems, hindering evacuation and emergency response and complicating recovery efforts.	ma-FL-SH-71, ma-DF-SH-222
ps-DR-SH-54	Drought	Threat	**City of St. Helena**	Residents lack clear, consistent information on drought stages, water rationing requirements, and available assistance programs during multi-year droughts.	ma-DR-SH-29
ps-DR-SH-55	Drought	Impact	**City of St. Helena**	Increasingly frequent and severe droughts heighten wildfire risk, stress water supplies for firefighting and cooling, and strain the City's ability to maintain service levels.	ma-DR-SH-30
ps-DR-SH-331	Drought	Victim	**City of St. Helena**	Seniors, medically vulnerable residents, and low-income households are disproportionately impacted by water rate increases and use restrictions during drought, with fewer resources to adapt.	ma-DR-SH-29, ma-AH-SH-7, ma-AH-SH-9
ps-EQ-SH-68	Earthquake	Victim	**City of St. Helena**	About 5,400 residents, including many seniors in Vineyard Valley, Woodbridge Village, and Silverado Orchards areas, live in severe shaking zones associated with the West Napa Fault and face disproportionate risk due to age, mobility, and housing type.	ma-EQ-SH-44, ma-AH-SH-9, ma-AH-SH-7, ma-AH-SH-8
ps-EQ-SH-86	Earthquake	Impact	**City of St. Helena**	A major earthquake could damage or destroy homes, businesses, and critical facilities; cause long-duration power and utility outages; displace residents; strain services for those who are ill-prepared needing food and water; disrupt tourism; and overburden public safety and city staff.	ma-EQ-SH-44, ma-AH-SH-8, ma-AH-SH-7, ma-AH-SH-9
ps-EQ-SH-331	Earthquake	Threat	**City of St. Helena**	Local bridges, older water transmission lines, and seismically vulnerable wastewater and stormwater infrastructure are at risk of significant damage in a major earthquake, threatening evacuation circulation and community lifelines, including water delivery.	ma-AH-SH-8, ma-FL-SH-71
ps-HH-SH-397	Extreme Heat	Threat	**City of St. Helena**	The number of extreme heat days and warm nights is anticipated to increase significantly by the end of the century.	ma-AH-SH-8, ma-AH-SH-9
ps-HH-SH-398	Extreme Heat	Victim	**City of St. Helena**	Outdoor workers, seniors, people with disabilities, and those without adequate shelter are disproportionately impacted by extreme heat events, including heat illness and economic stress.	ma-AH-SH-9
ps-HH-SH-399	Extreme Heat	Impact	**City of St. Helena**	Increased electricity demand and strain on the grid during extreme heat events can cause power outages, impacting people, utilities, and public services.	ma-AH-SH-8

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-FL-SH-112	Flood	Victim	**City of St. Helena**	Flooding along the Napa River can affect hundreds of residents living in the 100- and 500-YR floodplains.	ma-FL-NCo-53, ma-FL-SH-70, ma-FL-SH-71, ma-AH-SH-7
ps-FL-SH-118	Flood	Victim	**City of St. Helena**	St. Helena has at least one RL property on Pope Street, indicating ongoing, localized flood risk that has resulted in multiple paid NFIP claims.	ma-FL-SH-69, ma-FL-SH-70, ma-AH-SH-7, ma-FL-SH-71
ps-FL-SH-131	Flood	Impact	**City of St. Helena**	Flood events can damage or destroy structures and vineyards; disrupt business operations and tourism; displace residents and require evacuation and sheltering; and place prolonged demands on public safety and City staff.	ma-FL-SH-69, ma-FL-SH-71, ma-AH-SH-7
ps-FL-SH-135	Flood	Impact	**City of St. Helena**	Debris accumulation and high flows at the Pratt Avenue and Pope Street bridges, storm drain outfalls, and riverbanks can obstruct water flow, worsen localized flooding, and damage adjacent infrastructure and property.	ma-FL-SH-71
ps-SW-SH-334	Severe Weather	Impact	**City of St. Helena**	Severe winter storms and atmospheric river events can down trees, damage the urban forest, block roads, and cause power outages and utility disruptions, leading to temporary isolation and service interruptions.	ma-FL-SH-71, ma-AH-SH-9, ma-AH-SH-8, ma-AH-SH-7
ps-SW-SH-335	Severe Weather	Victim	**City of St. Helena**	Seniors, medically dependent residents, and households without backup power or reliable transportation are especially vulnerable to extended outages and limited mobility during severe storms and high-wind events.	ma-FL-SH-71, ma-AH-SH-7, ma-AH-SH-8, ma-AH-SH-9
ps-SF-SH-332	Slope Failure	Impact	**City of St. Helena**	Multiple critical facilities and miles of infrastructure could be damaged or blocked from repair and maintenance access due to landslides or other slope failures.	ma-SF-SH-223, ma-FL-SH-71
ps-SF-SH-333	Slope Failure	Victim	**City of St. Helena**	Approximately 500 residents live in high landslide susceptibility areas, exposing them to isolation risks from damaged lifelines in a major slope failure event.	ma-FL-SH-71, ma-SF-SH-223
ps-WF-SH-186	Wildfire	Impact	**City of St. Helena**	Wildfires can generate prolonged smoke and poor air quality; damage structures and vineyards; cause power outages and road closures; strain sheltering and health care facilities; impact businesses and tourism; and create long work hours and stress for public safety and City staff.	ma-WF-SH-103, ma-AH-SH-7, ma-AH-SH-8, ma-AH-SH-9
ps-WF-SH-192	Wildfire	Victim	**City of St. Helena**	Residents, visitors, and businesses within and adjacent to the WUI, including seniors in Silverado Orchards, Hunts Grove, Stone Bridge Apartments, Culinary Institute dorms, Woodbridge Village, and Vineyard Valley and students at local schools, are at risk of evacuation, displacement, smoke inhalation, and lifeline disruption during a wildfire.	ma-WF-SH-103, ma-WF-SH-104, ma-WF-SH-106, ma-AH-SH-7, ma-WF-SH-103

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-WF-SH-197	Wildfire	Threat	**City of St. Helena**	Extensive WUI areas, fuel buildup following wet winters, and human ignition sources (e.g., equipment use, debris burning, and arson) increase the threat of fast-moving wildfires impacting St. Helena and nearby critical water facilities. According to the California Board of Forestry's Assessment 220 structures in "High" severity zone. 8 structures in "Very High" severity zone.	ma-WF-SH-104, ma-WF-SH-105, ma-WF-SH-103

4.6 Mitigation Strategy

This section provides the framework for how the City of St. Helena will reduce hazard risk within its jurisdiction while supporting the broader goals of the Napa County MJHMP. It includes an overview of existing capabilities, opportunities to strengthen resilience, and the city's prioritized mitigation actions. Together, these elements demonstrate how St. Helena integrates hazard awareness into its planning and development processes while contributing to a coordinated countywide approach.

Within the Napa County MJHMP, the mitigation strategy serves as the roadmap for future hazard mitigation efforts. For St. Helena, the strategy outlined in this annex reflects the outcomes of the countywide planning process while also addressing the city's unique risks, priorities, and community needs. The strategy is designed to reduce vulnerabilities identified in the risk assessment, including the problem statements developed for flooding, earthquakes and liquefaction, slope failure, wildfire, drought, severe storms, extreme heat, and climate change.

Mitigation actions identified in this annex include both policy-based and project-based initiatives, with an emphasis on integrating resilience into land use planning, infrastructure investments, and community programs. Actions are structured to align with FEMA's requirements and to coordinate with existing city, county, and regional planning mechanisms. Each action identifies responsible parties, potential funding sources, and the resources needed for implementation.

For St. Helena, this strategy provides a framework for strengthening resilience by combining city-led initiatives, such as infrastructure improvements, building code enforcement, and community preparedness, with regional coordination through the MJHMP. By advancing these efforts in alignment with the General Plan and other local planning documents, St. Helena enhances its ability to reduce hazard risk while supporting long-term community safety, sustainability, and economic stability.

The subsections that follow describe these elements in detail:

- **Sections 4.6.1, Capabilities and Opportunities,** provides a summary of the city's capacity to address natural hazards.
- **Section 4.6.2, Mitigation Action Plan,** presents St. Helena's prioritized actions to guide implementation in coordination with countywide strategies.

- **Section 4.6.3, Status of Previous Mitigation Actions,** provides a summary of all previous actions and their current status, whether completed, cancelled, or revised.

Aligning the Action Plan

This section connects St. Helena's mitigation actions with its existing capabilities and areas for growth. Capability assessments are a required element of hazard mitigation planning under the Disaster Mitigation Act of 2000 and FEMA's 2023 guidance, ensuring that actions are realistic, achievable, and aligned with available resources.

The section begins with a summary of St. Helena's capabilities across four areas: planning and regulatory, administrative and technical, fiscal, and education and outreach. This overview highlights the tools and strengths that the district already uses to reduce hazard risk. The section then provides a detailed analysis of each capability area, identifying both current practices and opportunities to expand resilience.

4.6.1 Capabilities & Opportunities

This section provides a detailed assessment of the city's current capabilities to support hazard mitigation, as well as future opportunities. This consists of describing how the city is planning for hazards and growth and a summary of its existing capabilities and the potential for enhancement.

4.6.1.1 Planning for Hazards & Growth

As a general law city, the City of St. Helena manages growth within the framework of California's comprehensive planning, zoning, subdivision, and environmental regulations. Much of the City's developable land has already been urbanized, and remaining growth is largely directed toward infill development, redevelopment, and planned buildout within the existing urban footprint. St. Helena is bisected by the Napa River, with hillside terrain to the west and east, which constrains outward expansion and concentrates future development in areas already subject to natural hazards.

This development pattern places portions of the city's population, infrastructure, and economic assets within areas exposed to hazards such as riverine flooding along the Napa River, dam inundation zones, strong earthquake ground shaking and liquefaction, and extreme heat and drought conditions. Industrial and commercial areas near the river corridor and residential neighborhoods in low-lying areas are particularly sensitive to flooding, while hillside areas east of the city face localized risks related to slope instability and wildfire exposure.

Hazard vulnerability is addressed through coordination with the city's General Plan, particularly the Safety Element, which integrates hazard information into land use decisions, infrastructure planning, and development review. This approach ensures that growth and redevelopment consider site-specific risks and incorporate appropriate mitigation measures, such as flood-resilient design, geotechnical stabilization, and emergency access planning. Integration of hazard considerations into long-range planning also supports compliance with state and federal hazard mitigation requirements and strengthens the City's eligibility for disaster recovery and resilience funding.

Climate change is expected to intensify several of the hazards affecting St. Helena, including more extreme precipitation events, prolonged drought, and increasing extreme heat. As growth continues within constrained and hazard-exposed areas, resilience must be embedded into every phase of planning and development. Growth management in St. Helena therefore emphasizes sustainable building practices, water conservation, protection of natural floodplain functions, and climate-adaptive infrastructure, ensuring that future development and redevelopment reduce, rather than exacerbate, existing hazard risks and support long-term community resilience.

Long-Range Planning & Growth Management

Long-range planning and growth management policies play a central role in limiting hazard exposure in St. Helena. The city's General Plan establishes the overall land use pattern, directs growth toward areas that can be safely and efficiently served by infrastructure, and discourages development in areas subject to significant natural hazards where feasible.

Growth in St. Helena has largely occurred within an established urban footprint, with an emphasis on infill development, redevelopment, and planned expansion areas that are supported by existing transportation, utility, and emergency services. This approach helps reduce the need for development in hazard-prone areas such as floodplains, steep slopes, and wildfire-prone wildland–urban interface locations. Where development does occur near hazard areas, planning policies emphasize hazard-aware site design, infrastructure resilience, and emergency access.

Long-range planning efforts also account for future climate conditions, recognizing that sea level rise, extreme heat, drought, and more intense storm events may alter hazard profiles over time. Incorporating these considerations into growth management helps ensure that future development does not increase vulnerability or place undue strain on emergency response and public services.

Building Codes & Development Standards

St. Helena's development strategies combine comprehensive planning frameworks with robust regulatory measures to guide growth while reducing risks from natural hazards. Building codes play a central role in this approach. Nationally, continual improvements to building codes since 1990 have added only about one percent to construction costs while greatly improving disaster resilience (National Institute of Building Sciences, 2019). In California, building codes are among the most stringent in the world, setting minimum standards that safeguard against hazards such as earthquakes, flooding, wildfire, landslides, and severe weather. St. Helena enforces these standards locally, providing a strong foundation for resilient construction.

The city is required to regularly update its development regulations to reflect the California Building Code (CBC), which is revised every three years and was most recently updated in 2025. The CBC establishes some of the world's highest construction standards, ensuring occupant safety in the face of natural hazards. Climate change is also addressed through adoption and updating of the California Green Building Standards (CALGreen) and Energy Codes, which integrate energy efficiency, sustainable design, and climate

adaptation measures. In addition, St. Helena participates in the National Flood Insurance Program (NFIP), requiring that all new development in designated flood hazard areas meet FEMA's minimum flood protection standards.

Through these building and development regulations, St. Helena ensures that new development in hazard-prone areas is either restricted or subject to strict hazard-mitigation requirements. Where development is allowed, codes emphasize reducing exposure and vulnerability through appropriate siting, advanced construction techniques, emergency access, and defensible space. For example, new construction in the wildland–urban interface (WUI) must comply with fire-resistant building materials and vegetation management requirements under the California Fire Code.

Beyond code enforcement, St. Helena integrates these mandates into broader local planning frameworks, including the General Plan and HMP This alignment ensures that growth management, environmental review, and hazard mitigation strategies collectively address emerging risks from wildfire, drought, flooding, extreme heat, and severe weather intensified by climate change.

California Environmental Quality Act (CEQA) & Hazard Mitigation

The California Environmental Quality Act (CEQA) requires General Plans, Specific Plans, and major development projects to evaluate hazards such as seismic risk and wildfire. Environmental documents must identify these risks and propose mitigation measures, which may include setbacks from hazard-prone areas, infrastructure upgrades, evacuation planning, or restrictions on development in high-risk zones.

Regional and state public safety planning frameworks that inform development review in St. Helena include the State Seismic Hazards Mapping Act, the California Environmental Quality Act (CEQA) and its Guidelines, California Noise Insulation Standards (Title 24), and the Federal Emergency Management Agency (FEMA) Flood Insurance Program. Together, these programs establish requirements for evaluating and mitigating environmental and hazard-related impacts associated with development.

Under CEQA, residential projects that require discretionary approval from the city are subject to environmental review concurrently with the approval process. While CEQA review can add time to development and is therefore considered a potential constraint to housing production, much of St. Helena's remaining vacant and developable land has already undergone environmental review through Environmental Impact Reports (EIRs) prepared as part of adopted specific plans. These EIRs streamline subsequent project-level CEQA review by identifying environmental impacts and mitigation measures in advance, allowing later residential projects to tier from or rely on existing CEQA documents. Projects that deviate from the assumptions or scope of adopted specific plans may also tier from previously certified CEQA analyses, where appropriate.

Recent updates to CEQA standards have also changed how transportation and air quality impacts are evaluated. Transportation impacts are no longer assessed using Level of Service (LOS), which measured vehicle delay, but instead rely on Vehicle Miles Traveled (VMT) as the primary metric. This shift emphasizes reducing vehicle travel and associated emissions rather than roadway congestion.

In addition, updated Bay Area Air Quality Management District (BAAQMD) greenhouse gas (GHG) thresholds, adopted in April 2022, require changes to how GHG impacts are analyzed in CEQA documents. Under these standards, plans or projects within BAAQMD jurisdiction must either demonstrate consistency with an adopted, qualified local Climate Action Plan or incorporate specific project features, including all-electric buildings, a minimum reduction in VMT, and electric vehicle infrastructure meeting CalGreen Tier 2 requirements.

Although LOS is no longer used for CEQA compliance, the city continues to use LOS analysis as a non-CEQA planning tool to evaluate roadway operations, support infrastructure planning, and ensure that key transportation corridors function effectively and meet community expectations. Together, CEQA and related regulatory frameworks play a critical role in integrating hazard mitigation, climate adaptation, and sustainability considerations into development and long-range planning decisions in St. Helena.

By integrating hazard analysis into the development review process, CEQA helps ensure that future growth in St. Helena is designed with resilience and long-term community safety in mind.

4.6.1.2 Development & Hazard Considerations

Development in the City of St. Helena occurs within a physical and regulatory context shaped by natural hazards, environmental constraints, and long-term growth management policies. As a general law city operating under California planning and environmental regulations, St. Helena evaluates development proposals with consideration for hazard exposure, public safety, infrastructure capacity, and long-term resilience. This integrated approach helps ensure that new development and redevelopment do not increase risk to people, property, or critical systems.

Much of the city's remaining development potential lies within areas that are already urbanized or planned through adopted specific plans. As a result, development often occurs in proximity to known hazard areas, including floodplains along the Napa River, dam inundation zones, liquefaction-prone soils, and areas exposed to strong seismic shaking and extreme heat. Rather than avoiding development entirely in these locations, the city emphasizes risk-informed site planning, design, and construction standards to reduce vulnerability and limit potential impacts.

Flood hazards are addressed through enforcement of flood plain management regulations, participation in the National Flood Insurance Program, and incorporation of flood-resilient design measures for development in or near mapped flood hazard areas. These measures may include elevating structures, protecting utilities, maintaining flood conveyance, and avoiding critical facilities in the highest-risk locations. Development decisions also consider future flood conditions associated with more intense storm events.

Seismic hazards are a key consideration in development review due to the City's location within the seismically active San Francisco Bay Area. Projects are required to comply with state seismic design standards and, where appropriate, conduct site-specific geotechnical investigations to address ground

shaking, liquefaction, and slope stability. These requirements help reduce structural damage and protect infrastructure during earthquake events.

Wildfire, slope failure, and extreme weather hazards are also considered during development review, particularly in areas near the eastern hills, open space, and transportation corridors. Development standards related to defensible space, access, drainage, and emergency response are used to minimize risk and support safe evacuation and emergency operations.

The CEQA provides a framework for identifying hazard-related impacts at the project level and requiring feasible mitigation measures. Through CEQA review, the city evaluates whether proposed development would expose people or structures to significant risks from natural hazards and ensures that appropriate avoidance, design, or mitigation measures are incorporated into project approvals.

4.6.1.3 Capabilities & Opportunities Assessment

To develop a realistic and actionable mitigation strategy, it must account for existing jurisdictional capabilities and what future opportunities there are to enhance those capabilities for purposes of hazard mitigation. This section provides an assessment of the City of St. Helena's existing capabilities and future opportunities, including planning and regulatory, administrative and technical, fiscal, and public outreach and education capabilities. This assessment also identifies opportunities to integrate this MJHMP into future planning, policies, or programs to weave mitigation efforts into daily operations and address hazard problems wholistically. Capabilities are categorized into four groups and include various mechanisms.

- **Planning and Regulatory Capabilities:** Existing long-range plans, emergency response plans, hazard-specific plans, land use policies, and building and development standards.
- **Administrative and Technical Capabilities:** Available expertise in emergency services, engineering, grant management, and community planning.
- **Fiscal Capabilities:** Budgetary capacity, taxing authority, grants, and other funding mechanisms that can support mitigation projects.
- **Outreach and Education Capabilities:** Existing programs for providing technical assistance, community education, public warnings, and stakeholder engagement.

A full description of the process used to develop the capabilities assessment is provided in Volume 1, Section 2.3.3.

This capabilities and opportunities assessment for St. Helena lists the various types of capabilities along with how they have been, currently are, or will in the future be integrated into hazard mitigation planning efforts. The three "HMP Integration" columns that identify the capability's status and usage are color-coded with green, yellow, or orange shading to communicate the following:

- **Status:** If the capability is present at all and what level of use it has generally.
- **Current Mitigation Use:** If the capability is currently being used in mitigation efforts, specifically, and at what level.

- **Future Opportunity:** If there is a future opportunity to integrate the capability into mitigation efforts and at what level.

Summary of Capabilities & Opportunities

This Capabilities and Opportunities Assessment for the City of St. Helena summarizes the various types of capabilities it has for hazard mitigation currently. The assessment also identifies opportunities to integrate, expand, and improve the city's capabilities for future hazard mitigation. Table 4-16 provides a comprehensive list of capabilities and identifies the current status, current mitigation use, and future opportunities.

Planning & Regulatory

The City of St. Helena has strong planning and regulatory capabilities that support hazard risk reduction and resilient development. The city enforces the California Building Code (Title 24) and locally adopted ordinances that address floodplain management, fire safety, stormwater control, water conservation, and development in inundation and hillside areas. These regulations are integrated into zoning, subdivision, and site plan review processes, ensuring that hazard considerations are addressed during development reviews.

Growth management is guided by policies in the city's General Plan. Capital investments are prioritized through the Capital Improvements Program (CIP), which supports resilient infrastructure for water, storm drainage, transportation, and public services. St. Helena maintains several hazard reduction programs, including stormwater management and erosion control, water conservation through a water neutrality policy, and public outreach through the Alter Napa County emergency preparedness webpage. The city also promotes non-structural earthquake preparedness and household-level mitigation actions.

The City participates in the National Flood Insurance Program (NFIP) and enforces local floodplain management regulations supported by current FEMA flood mapping and elevation certificate records. While flood preparedness information is available, flood insurance education is limited, and the City does not currently participate in FEMA's Community Rating System (CRS), representing a future opportunity for enhanced flood risk reduction.

Future integration of the MJHMP will occur through various processes and mechanisms outlined across multiple mitigation actions (Table 4-17). Key opportunities for future hazard mitigation integration with the City of St. Helena's existing planning mechanisms include incorporating the updated risk assessment, hazard-specific vulnerability findings, and projected climate change impacts into the Emergency Preparedness Awareness Campaign (ma-AH-SH-7), and the All-Hazard Mitigation Education Program (ma-AH-SH-9).

Administrative & Technical

The City of St. Helena has strong administrative and technical capacity to support hazard mitigation planning, implementation, and coordination. Core planning, engineering, and development review functions are housed within the Community Development Department. These staff provide expertise in land use planning, development review, infrastructure design, and enforcement of building and safety standards.

The city has access to qualified personnel for key hazard mitigation functions, including community planning, land development review, construction engineering, natural hazards analysis, transportation planning, and resilience planning. The Community Development Department provides building code administration, and the City Manager serves as the Floodplain Administrator and Director of Emergency Services, ensuring direct coordination between planning, emergency management, and floodplain compliance. Fire prevention and wildfire mitigation functions are supported by the St. Helena Fire Department through the Fire Marshal.

While the City does not have dedicated staff for public outreach, GIS, or grant management, these functions are addressed through shared responsibilities across departments and through coordination with regional partners such as Napa County, which provides GIS support. This shared staffing approach effectively supports current mitigation activities but represents an opportunity for enhancement as hazard mitigation, climate adaptation, and grant funding efforts expand.

Warning Systems & Services

The City of St. Helena has strong warning and emergency communication capabilities to alert residents, businesses, and visitors of hazardous conditions and emergency situations. The city utilizes the Alert Napa County emergency notification system as its primary platform for disseminating time-sensitive warnings related to natural hazards, evacuations, sheltering, and public safety incidents.

Emergency information is also communicated through city and partner social media channels, which provide rapid updates and situational awareness during evolving incidents. These electronic communication methods are supplemented by non-electronic outreach, including door-to-door notifications when necessary, and emergency vehicle sirens used by police and fire agencies to warn the public in affected areas.

This multi-channel approach helps ensure redundancy and increases the likelihood that critical information reaches residents with varying access to technology or communication needs. Warning systems support response to a range of hazards, including flooding, wildfire, earthquakes, extreme weather, and power shutoff events.

Fiscal

The City of St. Helena has moderate to strong fiscal capacity to support hazard mitigation through a combination of local revenues, fees, grants, and long-term financing tools. These funding mechanisms

support infrastructure maintenance, capital improvements, and implementation of hazard mitigation measures identified in city plans and programs.

The City collects utility fees for water, recycled water, and sewer services, which help fund infrastructure upgrades that support drought resilience, flood protection, and system reliability. System development and impact fees are also a key funding source and are assessed for traffic, housing, water and wastewater capacity, parks and recreation, civic facilities, General Plan implementation, and fire district mitigation. These fees help ensure that new development contributes to infrastructure needed to safely accommodate growth.

St. Helena has the authority to use general obligation bonds and special tax or revenue bonds to finance large capital projects, providing flexibility to fund hazard mitigation–related infrastructure improvements when voter approval or project-specific revenues are available. The city also adopts a Capital Improvement Program (CIP) tied to the annual budget, which prioritizes investments in infrastructure that supports public safety and resilience.

Additional funding sources include Community Development Block Grants (CDBG), which can be used for hazard-related housing rehabilitation and infrastructure improvements, particularly for vulnerable populations. While special-purpose taxes and benefit assessments are not consistently used, the City has the authority to pursue voter-approved tax measures for specific purposes, such as public safety or infrastructure, representing a future opportunity to expand mitigation funding.

Education & Outreach

The City of St. Helena has strong education and outreach capabilities that support public awareness, preparedness, and risk reduction for natural hazards. The city maintains a dedicated emergency preparedness webpage, Alert Napa County which centralizes information on alerts, evacuations, flooding, wildfire, earthquakes, power shutoffs, and other hazards. This resource serves as the primary hub for hazard-related public information.

The city actively uses social media platforms, including City websites, Facebook, Instagram, LinkedIn, Nextdoor, Threads, X, and YouTube, to disseminate emergency information, preparedness messaging, and real-time updates during incidents. These digital tools are complemented by participation in annual public safety and preparedness events, such as the Great California ShakeOut and Ready Napa County initiatives.

St. Helena supports community-based preparedness through the Community Emergency Response Team (CERT) program and partnerships with regional organizations, including local Fire Safe Councils and the Napa Communities Firewise Foundation. The city also collaborates with the Napa County Resource Conservation District, which provides outreach related to wildfire, drought, and other environmental hazards.

City staff are available to respond to public inquiries and provide technical assistance related to hazard preparedness, floodplain regulations, and development standards through phone, email, and web-based

requests. While hazard information is primarily disseminated online, printed materials and library-based resources are used on a limited basis, representing an opportunity for expanded outreach to residents with limited digital access.

ASSESSMENT LEGEND

HMP Integration

Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Table 4-16: City of St. Helena Capabilities and Opportunities Assessment

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Planning and Regulatory Capabilities				
Construction and Future Development Regulations				
Building Codes				California Building Code (California Code of Regulations, Title 24) adopted under Title 15
BCEGS Rating				
Public Protection (ISO Class)				Class 3
Hazard-Related Development Standards				Fire Hazard Severity Zones (Ch 8.44); Stormwater and Runoff Pollution Control (Ch 13.32); Fire Code (Ch 15.35); Retrofitting of Unreinforced Masonry Buildings (15.40); Flood Damage Prevention (Ch 15.52); Subdivisions (Title 16); Zoning Code (Title 17); Environment (Title 18)
Zoning Ordinance				Title 17 Zoning Code establishes districts and standards that address flood, drought, and fire hazards
Hazard-Specific Ordinance				Fire Hazard Severity Zones (Ch 8.44); Stormwater and Runoff Pollution Control (Ch 13.32); Fire Code (Ch 15.35); Retrofitting of Unreinforced Masonry Buildings (15.40); Flood Damage Prevention (Ch 15.52); Water Shortage Emergency Ordinance; Water Use Efficiency and New Development (Ch 13.12)
Growth Management Ordinance				2040 General Plan

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Hazard Reduction Programs (Annually Conducted)				
Capital Improvements Program (CIP) or Plan				5-yr CIP maintained and implemented by Public Works Dept; covers infrastructure upgrades and hazard mitigation improvements
Erosion/Sediment Control Program				Ch 13.32 Stormwater and Runoff Pollution Control
Hazard-Related Public Outreach Program				Water Conservation and Rebate Programs; general hazard outreach and education
Urban Water Management Plan				Water Management Plan Ordinance
Stormwater Management Program (Annual Inspections)				Stormwater Management Program implemented by Public Works Dept
Seismic Safety Program (Non-structural)				General seismic safety information on Disaster Preparedness webpage
Earthquake Modernization Plan (Building Safety)				Ch 15.40 Retrofitting of Unreinforced Masonry Buildings
Hazard Plans				
General Plan Safety Element				2040 General Plan Public Health, Safety, and Noise Element covers flood, fire, geologic, and seismic hazards
Site Plan Review Requirements				Major and Minor Design Reviews
General Plan Environmental Justice Element				No standalone element; integrated into various 2040 General Plan elements
Community Wildfire Protection Plan (CWPP)				2021 Napa County CWPP
Economic Development Plan				2040 General Plan Economic Sustainability Element
Floodplain Management Plan				2040 General Plan Public Health, Safety, and Noise Element
Stormwater Management Plan				Stormwater Master Plan
Emergency Operations Plan				2017 Napa County EOP, City of St. Helena Annex; Evacuation Study
Climate Action Plan				2040 General Plan Climate Change Element; Napa County Regional Climate Action and Adaptation Plan (RCAAP)
Climate Vulnerability Assessment				2023 Climate Change Hazards and Vulnerability Assessment included in General Plan Safety Element; Napa County RCAAP includes regional assessment
Urban Greening Plan				2040 General Plan Open Space and Conservation and Climate Change Elements
Ground Water Management Planning / Plans				Maintained by Napa County Groundwater Sustainability Agency; Water Management Plan Ordinance governs City water use
National Flood Protection Program (NFIP)				

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Floodplain Management Regulations				Ch 15.52 Flood Damage Prevention in compliance with minimum NFIP requirements
Flood Insurance Education and Technical Assist.				General flood hazard guidance provided on Disaster Preparedness webpage; no insurance information; general technical assistance available
Flood Insurance Study				2016 FEMA FIS 06055CV000C
Elevation Certificates				Maintained by Community Development Dept, Building Division
Flood Hazard Mapping / Re-Mapping				FEMA FIRMs 2008-2016
Community Rating System (CRS)				Does not currently participate; future opportunity but limited staff capacity
Administrative and Technical				
Community Planning and Development Services				
Community Planner				Community Development Dept, Planning Division
Planner/Engineer (Land Development)				No dedicated staff; shared role in Public Works Dept, Engineering Division
Engineer/Professional (Construction)				Public Works Dept, Engineering Division
Planner/Engineer/Scientist (Natural Hazards)				Public Works Dept, Engineering Division
Transportation Planner				No dedicated staff; shared role in Public Works Dept, Engineering Division
Resiliency Planner				No dedicated staff; shared across departments and provided by consultants
Building Code Official (Full time or Augmented)				Community Development Dept, Building Division
Floodplain Administrator				City Engineer
Fire Marshal				City of St. Helena Fire Chief
Dedicated Public Outreach Personnel				No dedicated staff; shared across departments and supported by County
GIS Specialist and Capability				No dedicated staff; provided by Napa County GIS and consultants
Emergency Manager				No dedicated position; functions coordinated with Napa County OES
Dedicated Grant Manager, Writer, or Specialist				No dedicated staff; reliance on consultants or regional agencies for grant preparation and administration
Other	N/A	N/A	N/A	
Warning Systems/Services				
General				ALERT Napa County system and Hi-Lo sirens

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Flood				ALERT Napa County system and Hi-Lo sirens
Tornado				ALERT Napa County system and Hi-Lo sirens
Wildfire				ALERT Napa County system and Hi-Lo sirens
Geological Hazards				ALERT Napa County system and Hi-Lo sirens
Fiscal Capabilities				
Financial Resources for Hazard Mitigation				
Levy Taxes for Specific Purposes				Not consistently applied, but can place special tax measures on ballot for specific purposes (e.g., sales tax for public safety)
Utilities Fees				Water and sewer tap and service fees
Benefit assessments				Not currently in use
Community Development Block Grants				Received via HUD; can support hazard-related housing rehabilitation and infrastructure
System Development Fee				Development and impact fees for public safety, civic improvements, water, sewer, storm drainage, traffic, housing, and school district
General Obligation Bonds to Incur Debt				Not currently used, but available financing tools
Special Tax Bonds to Incur Debt				Not currently used, but authorized for specific projects
Withheld Spending in Hazard-Prone Areas				General Plan policies restrict development in hazard-prone areas
Stormwater Service Fees				Plan review and insepction fees; storm drainage impact fee
Capital Improvement Project Funding				CIP adopted; tied to annual budget
Education / Outreach Capabilities				
Education/Outreach Resources				
Website Dedicated to Hazard Topics				Disaster Preparedness webpage under Office of the City Manager provide information on fire, flood, earthquake, and other hazards
Dedicated Social Media				Active Facebook, Instagram, Threads, Twitter (X), Nextdoor, LinkedIn, and YouTube accounts
Local Citizen Groups That Communicate Hazard Risks				Informal local groups and neighborhood associations provide hazard information (e.g., Napa Valley COAD)
Hazard Info. Avail. at Library/ Planning Desk				Limited use; mostly web-based
Annual Public Safety Events				Participates in Earthquake ShakeOut, Ready Napa County, and other regular events

Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Ability to Field Public Tech. Assistance Requests				Staff respond to inquiries via phone, email, and web forms; department-specific technical assistance available
Public Safety Newsletters or Printed Outreach				Not used consistently; mostly web-based
Community Emergency Response Team (CERT)				Napa County CERT
Fire Safe Councils				Fire Safe Council and others through Napa Communities Firesafe Foundation
Firewise				Not currently designated
StormReady				Not currently designated
Resource Conservation Districts				Napa County RCD provides outreach on wildfire, drought, and other hazard topics; City participates through partnerships
Other	N/A	N/A	N/A	

4.6.2 City of St. Helena Mitigation Action

St. Helena's mitigation actions were developed through a collaborative process informed by the updated risk assessment, local priorities, and extensive stakeholder engagement. As part of this 2026 MJHMP update, the city reviewed mitigation actions from its prior Local Hazard Mitigation Plan to determine which actions to carry forward, which to consolidate, and where entirely new strategies were required. This careful evaluation ensured that the updated action plan builds upon past commitments while also responding to current risks and future challenges.

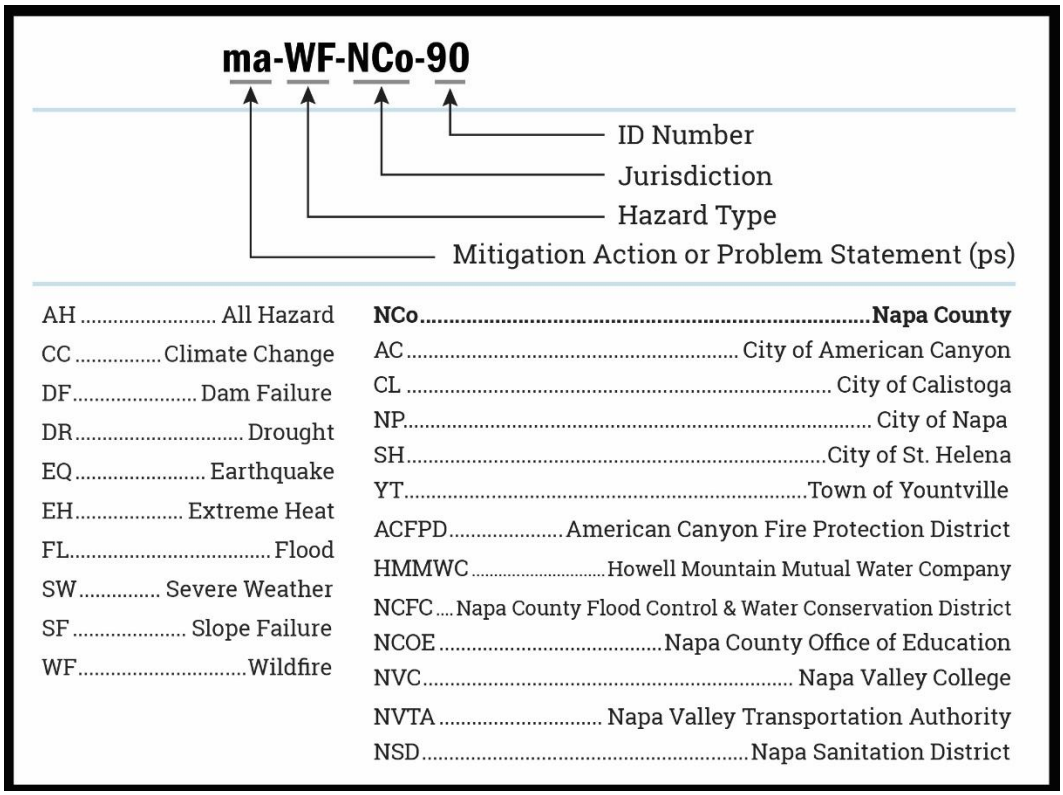


Figure 4-20: Mitigation Action Number Key

The plan addresses St. Helena's most significant hazards, including wildfire, earthquake, flood, slope failure, drought, dam failure, and extreme weather. Each mitigation action is designed to align with FEMA's hazard mitigation guidance and the requirements of the Disaster Mitigation Act of 2000. Where appropriate, overlapping or redundant actions were consolidated into broader, more comprehensive strategies that improve clarity, increase feasibility, and strengthen regional coordination.

The mitigation action prioritization method used by all participating jurisdictions is described in Volume 1, Section 4. Each action specific to St. Helena is documented in Table 4-17, which identifies the responsible department, implementation timeframe, potential funding sources, and resources required to complete the action. Each action is also assigned a unique alphanumeric identifier (see Figure 4-20) that links the strategy to its associated hazard and supports consistent monitoring and reporting.

St. Helena's approach recognizes that some hazards are most effectively addressed through regional efforts. Flood protection, drought resilience, and wildfire risk reduction often extend beyond the city's boundaries and require collaboration with county, regional, and state partners. By aligning local actions with regional

strategies, St. Helena helps to consolidate resources, maximize funding opportunities, and ensure that mitigation projects achieve the greatest benefit for the Napa Valley and the wider Napa County community.

Collectively, these mitigation actions provide a roadmap for reducing hazard risk, protecting vulnerable populations, and strengthening the long-term resilience of St. Helena.

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Table 4-17: City of St. Helena Mitigation Action Plan

Mitigation No.	Hazard Type	Sub-Hazard	Mitigation Type	Year	Primary Agency	Title	Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Problem Statements
ma-AH-SH-7	All Hazard		PE&A - Public Education & Awareness	2020	City of St. Helena	Emergency Preparedness Awareness Campaign	Update, improve, and maintain multi-hazard emergency preparedness information on the City website, social media accounts, and newsletters, including outreach on evacuation route and shelter information targeted to tourists through lodging operators.	City Manager's Office	Low	Medium	1-3 Years	Capacity / Capability Building	HMGP / BRIC , General Fund	High	ps-WF-SH-189, ps-WF-SH-190, ps-WF-SH-193, ps-FL-SH-136, ps-FL-SH-133, ps-FL-SH-132, ps-EQ-SH-88, ps-EQ-SH-87, ps-CC-SH-329, ps-DR-SH-331, ps-EQ-SH-68, ps-EQ-SH-86, ps-FL-SH-112, ps-FL-SH-118, ps-FL-SH-131, ps-SW-SH-334, ps-SW-SH-335, ps-WF-SH-186, ps-WF-SH-192
ma-AH-SH-8	All Hazard		ES - Emergency Services , SP - Structural Projects	2020	City of St. Helena	Critical Facility Power Resilience Projects	Assess, plan for, and implement microgrids and backup power systems at key facilities (EOC, fire station, police, water/wastewater, designated shelters) to maintain operations during and after hazard events.	Public Works Department	High	High	3-5 Years	Project	HMGP / BRIC , General Fund	High	ps-WF-SH-191, ps-EQ-SH-90, ps-CC-SH-329, ps-EQ-SH-331, ps-EQ-SH-68, ps-EQ-SH-86, ps-SW-SH-334, ps-SW-SH-335, ps-WF-SH-186, ps-EH-SH-399, ps-EH-SH-397
ma-AH-SH-9	All Hazard		PE&A - Public Education & Awareness	2020	City of St. Helena	All-Hazard Mitigation Education Program	Develop an outreach and education program that provides guidance on home, business, and public facility hazard mitigation, financial resources, and available technical assistance. Host annual workshops supported by free or low-cost resource kits, including on hazard insurance, earthquake risk and retrofits, wildfire structural hardening and defensible space, human-caused ignition, air quality mitigation measures, flood protection, drainage improvements, and slope failure prevention. This includes workshops targeted for homeowners, renters, mobile home occupants, small businesses, adult and child care providers, and schools and other assembly facilities.	City Manager's Office	Low	High	1-3 Years	Capacity / Capability Building	HMGP / BRIC , General Fund	High	ps-FL-SH-134, ps-EQ-SH-89, ps-CC-SH-329, ps-DR-SH-331, ps-EQ-SH-68, ps-EQ-SH-86, ps-SW-SH-334, ps-SW-SH-335, ps-WF-SH-186, ps-EH-SH-398, ps-EH-SH-397
ma-DF-SH-222	Dam Failure		PRV - Prevention , PE&A - Public Education & Awareness	2026	City of St. Helena	Dam Failure Evacuation Planning & Awareness Campaign	In coordination with dam owners and operators, update emergency evacuation procedures to address vulnerable neighborhoods, tourist areas, and high occupancy facilities, including improved warning systems. Conduct regular awareness campaigns to increase community understanding of risks and evacuation, including through targeted outreach and installing signage in areas of inundation.	Planning Department	Low	Medium	3-5 Years	Capacity / Capability Building	HMGP / BRIC , General Fund	Medium	ps-DF-SH-27, ps-DF-SH-330
ma-DR-SH-29	Drought		PRV - Prevention , NRP - Natural Resource Protection	2020	City of St. Helena	Water-Efficient Landscaping Assistance Program	Develop model planting plans, design guidance, and incentives to help residents and businesses shift to water-smart landscaping consistent with water-conservation policies.	Planning Department	Low	Medium	1-3 Years	Project	HMGP / BRIC , General Fund	High	ps-DR-SH-54, ps-CC-SH-329, ps-DR-SH-331
ma-FL-SH-71	Flood		NRP - Natural Resource Protection , SP - Structural Projects	2020	City of St. Helena	Drainage Improvement Projects	Improve stormwater conveyance capacity, debris control, slope stabilization, and maintenance practices to reduce localized flooding at key locations such as the Pratt Avenue and Pope Street bridges. Implement nature-based drainage solutions where feasible.	Public Works Department	High	High	5-10 Years	Project	HMGP / BRIC , FMA , General Fund	Medium	ps-FL-SH-135, ps-CC-SH-329, ps-DF-SH-27, ps-DF-SH-330, ps-EQ-SH-331, ps-FL-SH-112, ps-FL-SH-118, ps-FL-SH-131, ps-SW-SH-334, ps-SW-SH-335, ps-SF-SH-332, ps-SF-SH-333

Mitigation No.	Hazard Type	Sub-Hazard	Mitigation Type	Year	Primary Agency	Title	Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Problem Statements
ma-SF-SH-223	Slope Failure		PRV - Prevention	2026	City of St. Helena	Slope Stability Assessment	Identify and assess high-risk slopes and incorporate any needed improvements into the CIP for stabilization, stormwater management, erosion control, or other mitigation measures.	Public Works Department	Low	Low	1-3 Years	Project	HMGP / BRIC , General Fund	Medium	ps-SF-SH-332, ps-SF-SH-333
ma-WF-SH-103	Wildfire		PPRO - Property Protection , NRP - Natural Resource Protection	2020	City of St. Helena	Fuel Management & Critical Facility Hardening Projects	Conduct vegetation management and structural hardening projects for City properties and critical facilities, including in parks, on open space, along transportation routes, around schools and other facilities, and on adjacent private lands with landowner coordination. Implement air quality mitigation measures for shelters, schools, and other facilities.	Fire Department	High	High	3-5 Years	Project	HMGP / BRIC , General Fund , CalFIRE	High	ps-WF-SH-186, ps-WF-SH-192, ps-WF-SH-193, ps-CC-SH-329, ps-WF-SH-192, ps-WF-SH-197

4.6.3 Status of Previous Mitigation Actions

In 2020, the City of St. Helena adopted its previous FEMA-approved HMP. This 2026 MJHMP represents a comprehensive update from that previous plan, as discussed in Volume 1, Section 1.5. Table 4-18 provides status updates for all of the previous mitigation actions in the City of St. Helena HMP, from which many of the mitigation actions in Table 4-17 were sourced and revised.

Table 4-18: City of St. Helena Status of Previous Mitigation Actions

Mitigation No.	Hazard Type	Status	Year	Primary Agency	Title/Description	Reason Cancelled/ Completed
ma-AH-SH-7	All Hazard	Ongoing	2020	City of St. Helena	Emergency Preparedness Awareness Campaign	Revised
ma-AH-SH-8	All Hazard	Ongoing	2020	City of St. Helena	Critical Facility Power Resilience Projects	Revised
ma-AH-SH-9	All Hazard	Ongoing	2020	City of St. Helena	All-Hazard Mitigation Education Program	Revised
ma-DR-SH-29	Drought	Ongoing	2020	City of St. Helena	Water-Efficient Landscaping Assistance Program	Revised
ma-FL-SH-71	Flood	Ongoing	2020	City of St. Helena	Drainage Improvement Projects	Revised
ma-WF-SH-103	Wildfire	Ongoing	2020	City of St. Helena	Fuel Management & Critical Facility Hardening Projects	Revised
ma-DR-SH-30	Drought	Cancelled	2020	City of St. Helena	During drought conditions increase fuel reduction in parks and open space areas.	SH-16-2020, SH-02-2020, SH-03-2020 & SH-09-2020 combined and revised
ma-EQ-SH-44	Earthquake	Cancelled	2020	City of St. Helena	Develop earthquake mitigation resource kits for St. Helena residents, with focused outreach for adult care providers, private schools, and gathering facilities.	SH-12-2020, SH-14-2020, SH-05-2020, SH-01-2020, SH-04-2020, SH-08-2020 & SH-10-2020 combined and revised
ma-FL-SH-69	Flood	Cancelled	2020	City of St. Helena	Provide Napa River residents with flood protection resources, including technical support, education, and grant assistance for floodproofing.	SH-12-2020, SH-14-2020, SH-05-2020, SH-01-2020, SH-04-2020, SH-08-2020 & SH-10-2020 combined and revised
ma-FL-SH-70	Flood	Cancelled	2020	City of St. Helena	Provide flood mitigation resources to residents within the Vineyard Valley Mobile Home Park.	SH-12-2020, SH-14-2020, SH-05-2020, SH-01-2020, SH-04-2020, SH-08-2020 & SH-10-2020 combined and revised
ma-WF-SH-104	Wildfire	Cancelled	2020	City of St. Helena	Implement fuel reduction projects to reduce impacts to homes and businesses.	SH-16-2020, SH-02-2020, SH-03-2020 & SH-09-2020 combined and revised

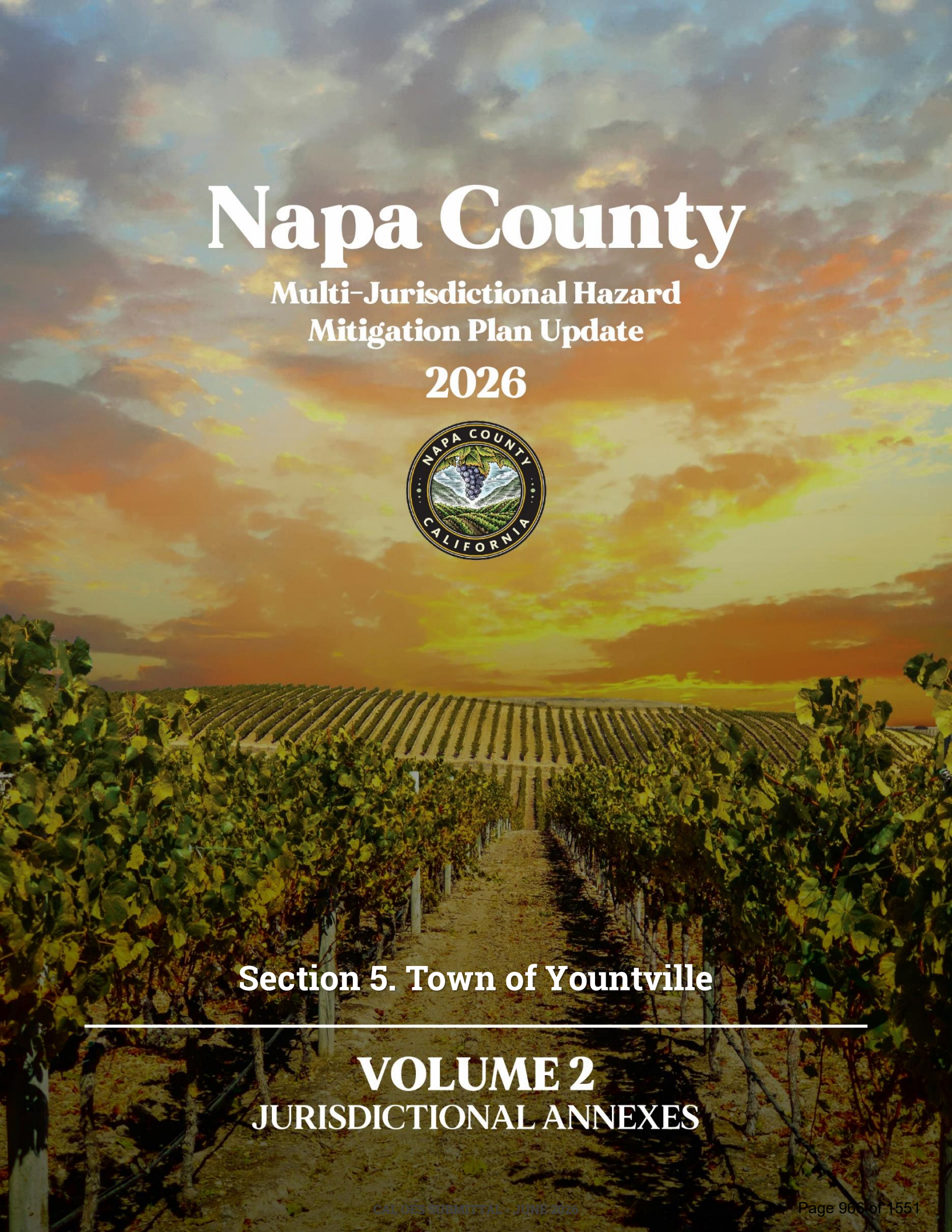
Mitigation No.	Hazard Type	Status	Year	Primary Agency	Title/Description	Reason Cancelled/ Completed
ma-WF-SH-105	Wildfire	Cancelled	2020	City of St. Helena	Retrofit At-Risk Structures with Ignition-Resistant Materials or Require or Encourage Fire-Resistant Construction Techniques.	SH-12-2020, SH-14-2020, SH-05-2020, SH-01-2020, SH-04-2020, SH-08-2020 & SH-10-2020 combined and revised
ma-WF-SH-106	Wildfire	Cancelled	2020	City of St. Helena	Develop and or share outreach material on air quality mitigation measures for residents before wildfire season.	SH-12-2020, SH-14-2020, SH-05-2020, SH-01-2020, SH-04-2020, SH-08-2020 & SH-10-2020 consolidated and revised
ma-WF-SH-107	Wildfire	Cancelled	2020	City of St. Helena	Implement fuel reduction/building retrofit projects to limit combustibility to school facilities.	SH-16-2020, SH-02-2020, SH-03-2020 & SH-09-2020 combined and revised
ma-WF-SH-108	Wildfire	Cancelled	2020	City of St. Helena	Develop Public awareness information for wildfire season related to flame/sparking equipment.	SH-12-2020, SH-14-2020, SH-05-2020, SH-01-2020, SH-04-2020, SH-08-2020 & SH-10-2020 consolidated and revised

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Napa County

Multi-Jurisdictional Hazard Mitigation Plan Update

2026



Section 5. Town of Yountville

VOLUME 2
JURISDICTIONAL ANNEXES

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Napa County

2026 Multi-Jurisdictional Hazard Mitigation Plan Update

Town of Yountville (YT)

Municipal Annex

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List of Figures

Figure 5-1: Town of Yountville Geographic Overview Map 5-11
Figure 5-2: Town of Yountville Median Household Income Map 5-15
Figure 5-3: Town of Yountville Poverty Status Map 5-16
Figure 5-4: Town of Yountville Housing Occupancy Map 5-17
Figure 5-5: Town of Yountville Dependent Age Groups Map 5-21
Figure 5-6: Town of Yountville Disabled Elderly Map 5-22
Figure 5-7: Town of Yountville Race and Ethnicity Map 5-24
Figure 5-8: Town of Yountville Spanish-Speaking Households Map 5-25
Figure 5-9: Town of Yountville CDC Social Vulnerability Index Map 5-27
Figure 5-10: Town of Yountville Risk Assessment Matrix 5-36
Figure 5-11: Exposure Summary – Yountville Wildfire Risk 5-40
Figure 5-12: Exposure Summary – Yountville Earthquake Risk (M7.1 Hunting Creek–Berryessa) 5-43
Figure 5-13: Exposure Summary – Yountville Earthquake Risk (M6.7 West Napa) 5-44
Figure 5-14: Exposure Summary – Yountville Liquefaction Risk 5-45
Figure 5-15: Exposure Summary –Yountville Flood Risk (FEMA Zones) 5-48
Figure 5-16: Drought Severity Timeline 2000-2024 5-52
Figure 5-17: Exposure Summary – Yountville Dam Inundation Zone 5-54
Figure 5-18: Mitigation Action Number Key 5-75

List of Tables

Table 5-1: Town of Yountville Population and Households 5-12
Table 5-2: Town fo Yountville Income and Poverty 5-13
Table 5-3: Town of Yountville Renter- and Owner-Occupied Housing 5-14
Table 5-4: Town of Yountville Households with Seniors 5-18
Table 5-5: Town of Yountville Households with Children 5-19
Table 5-6: Town of Yountville Population with Disabilities and Access to Transportation 5-20
Table 5-7: Town of Yountville Household Languages 5-23
Table 5-8: Town of Yountville Planning Team and Steering Group Members 5-30
Table 5-9: Town of Yountville Planning Team Meetings 5-31
Table 5-10: Town of Yountville Document Review of Potential Hazards 5-35
Table 5-11: Town of Yountville Hazards Prioritization Summary 5-37
Table 5-12: Town of Yountville National Flood Insurance Program Information 5-47
Table 5-13: Drought Classifications and Impacts 5-50
Table 5-14: Town of Yountville Hazard Problem Statements 5-58
Table 5-15: Town of Yountville Capabilities and Opportunities Assessment 5-70
Table 5-16: Town of Yountville Mitigation Action Plan 5-77
Table 5-17: Town of Yountville Status of Previous Mitigation Actions 5-79

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Adoption Resolution

To comply with the Federal Disaster Mitigation Act of 2000 (DMA 2000), the Yountville Town Council has officially adopted this 2026 Napa County Multi-Jurisdictional Hazard Mitigation Plan, including Volume 1 in its entirety as well as this Volume 2 municipal annex. The adoption of the MJHMP recognizes the town's commitment to reducing the impacts of natural hazards within its jurisdiction and across Napa County.

A copy of the town's adoption record is provided on the following pages. Adoption records for all jurisdictions are summarized in Volume 1, Table ES-1.

ADOPTION RECORD TO BE INSERTED UPON COMPLETION.

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Section 5. Town of Yountville

5.1 Scope & Purpose

This Jurisdictional Annex for the Town of Yountville of the 2026 Napa County Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) details the hazard mitigation planning elements specific to the town's planning area. The annex is not intended to be a standalone document but appends to and supplements the information contained in the umbrella plan document (Volume 1). As such, all sections of the umbrella plan, including the planning process and other procedural requirements, apply to and were met by the Town of Yountville. This annex provides additional information specific to the Town, with a focus on hazard identification and risk assessment, vulnerability assessment, problem statements, mitigation strategy, and capabilities assessment. Below are the Town of Yountville Points of Contact:

Primary Point of Contact	Alternate Point of Contact
Hilary Gaede, Communications Director / Town Clerk Town of Yountville 6550 Yount Street Yountville, CA 94599 Telephone: (707) 944-8851 email: hgaede@yville.com	John Ferons, Public Works Director Town of Yountville 6550 Yount Street Yountville, CA 94599 Telephone: (707) 944-8851 email: jferons@yville.com

5.2 Jurisdictional Setting

The Town of Yountville sits in the heart of the Napa Valley in Napa County in Northern California, approximately 40 miles north of San Francisco. The town is bounded by the Mayacamas Mountains to the west, the Napa Valley to the south and north, and the Napa River to the east. The Town is situated along Highway 29, which provides regional access to other parts of Napa County. Yountville is a small town best known for the Veteran's Home of California, Yountville, fine-dining establishments, and upscale resorts.

Yountville encompasses approximately 1.5 square miles, mostly on the Napa Valley floor. The Napa River meanders east of the town limits. The western portion of the town limits contains the Veteran's Home, a golf club, and winery, and edges up against the Mayacamas Mountains. This varied topography and semi-proximity to a major waterway influences the Town's exposure to natural hazards, including flooding, seismic shaking, wildfire along the wildland–urban interface, and climate change–related impacts such as extreme heat and increased flood risk.

The Town operates as a general law municipality under a council–manager form of government and provides a full range of municipal services, including public works, planning and building, and water, wastewater, and recycled water services. The Town contracts with the Napa County Sheriff's Department

for police protection and the Napa County Fire Department/CALFIRE for fire protection and emergency medical services.

The Town of Yountville's location within Napa County is shown in Figure 5-1.

- **Year of Incorporation:** 1965
- **2021 Population:** 3,397 (US Census Bureau, 2021)
- **Population Growth:** Low-to-Moderate

5.2.1 Geography & Climate

The Town of Yountville is located in the Napa Valley at the base of the Mayacamas Mountains. The town is located west of the Napa River. Figure 5-1 provides geographic overview of Napa County. Hydrologically, Yountville is part of the Napa River watershed, which conveys runoff from northern Napa County through the town before discharging into San Pablo Bay. Portions of the town lie near or within historic floodplain areas, particularly adjacent to the Napa River. These low-lying areas are subject to flooding. Stormwater systems throughout the town are designed to manage runoff generated by seasonal precipitation.

The climate in Yountville and the Napa Valley is warmer than that in the rest of the Bay Area. Nevertheless, in summer, Yountville and the rest of the Napa Valley are protected from the hot weather of the Central Valley of California by the coastal mountain ranges. The Pacific Ocean provides a source of cool, moist air in the summer, and this steady flow of marine air holds temperatures at a moderate level. The greatest variation in temperature occurs in summer. In Yountville, average high summer temperatures are in the upper 80's to the mid 90's. Winters are generally mild, but there are occasional cold spells. Average high winter temperatures are in the high 50's to low 60's, while the minimum temperatures are in the upper 20's and 30's. Frost is common during clear, calm mornings in the late fall and winter.

The growing season, which is the period between the last freezing temperature event in spring and the first in fall, ranges from 215 to 260 days in Yountville. Most of the annual precipitation falls during the period of November through April. The greatest amount of rainfall in one hour is expected to range from 0.9 inch in one hour once in two years to 2.1 inches in one hour once in 100 years.

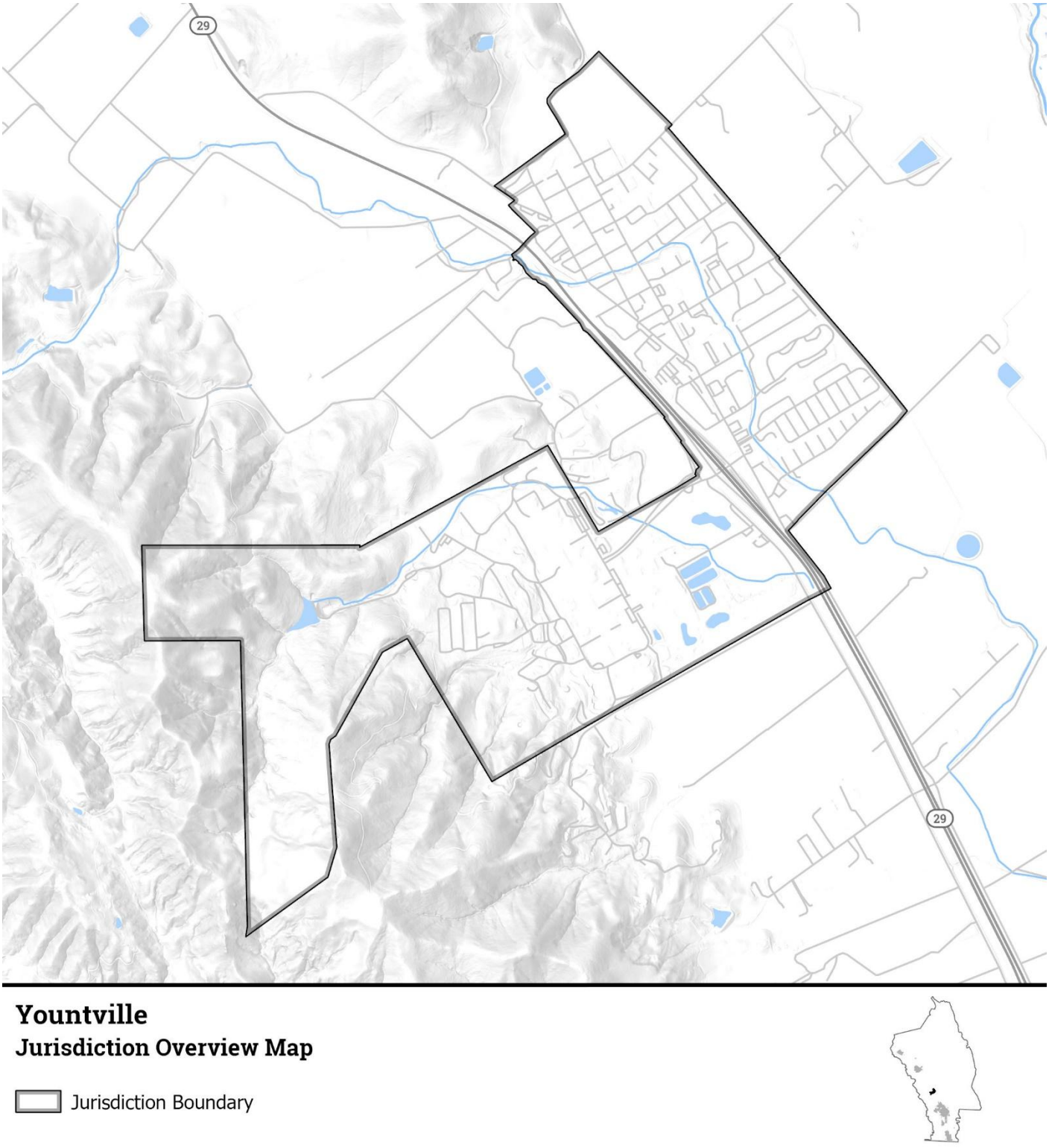


Figure 5-1: Town of Yountville Geographic Overview Map

5.2.2 Demographics & Vulnerable Populations

This section describes the demographic characteristics of the Town of Yountville to guide hazard mitigation planning efforts. Natural disasters affect communities both physically and socially, with demographic composition playing a central role in determining how impacts are distributed, particularly among vulnerable groups facing greater challenges in preparedness, response, and recovery. Understanding the area's social and economic landscape also helps assess potential social costs from infrastructure damage, including housing, industry, public facilities, essential services, and transportation.

Exploring local demographic data may help to identify groups and geographic areas with specific vulnerability to hazard events. In the context of all-hazards preparedness and response planning, at-risk individuals (often used interchangeably with "vulnerable populations") are defined federally as "children, pregnant women, senior citizens, and other individuals who have access or functional needs in the event of a public health emergency." (42 U.S.C. § 2802(b)(4)(B) (2019)) These populations may include, but are not limited to, individuals who are economically disadvantaged, living with disabilities, dependent on caregivers, from historically marginalized communities, have limited English proficiency or are non-English speaking, lack access to transportation, are experiencing homelessness, or have chronic medical conditions.

Certain populations face greater risk following a natural hazard event due to age, economic mobility, physical disability, geographic location, or a combination of factors. Vulnerability in the face of a hazard event is not a fixed characteristic; the same individual may be at risk for some hazards but not at risk for others. Planning for vulnerable populations in the context of hazard mitigation can help communities to prioritize limited resources where they will be the most effective. Refer to Volume 1, Section 1.4.3, for a more in-depth discussion of planning for vulnerable populations, at-risk individuals with access and functional needs, and environmental justice.

The total population, total number of households, and average household size of the Town of Yountville are presented in Table 5-1, compared to the other municipalities and Napa County. As shown in the table, Yountville is the smallest incorporated community in Napa County.

Table 5-1: Town of Yountville Population and Households

Area	Total Population	Total Households (HH)	Average HH Size
Napa County	137,384	55,588	2.40
City of Napa	79,233	31,666	2.47
City of American Canyon	21,669	5,924	3.64
City of Calistoga	5,191	2,330	2.20
City of St. Helena	5,426	2,963	1.81
Town of Yountville	**3,397**	**1,824**	**1.45**

Source: ACS 5-Year, 2017-2022

5.2.2.1 Income & Housing

Economic mobility is one of the most important predictors of natural hazard vulnerability. Low-income residents are more likely to occupy housing which is inadequately maintained or otherwise poorly built to withstand extreme events. For example, mobile or modular homes are more susceptible to damage in earthquakes and floods than other types of residences and are less likely to contain air conditioning units to cope with high heat events. In urban areas, low-income residents are more likely to occupy older homes and apartment complexes with unreinforced masonry, which is particularly susceptible to seismic damage.

Low-income households and communities face disproportionate financial burden from costs associated with disaster preparedness, response, and recovery. Disasters create unexpected expenses which may serve as "tipping points" for families and individuals living on the edge of poverty or homelessness. Recovery costs may be higher for those without resources to conduct hazard mitigation activities ahead of time. Families and individuals who lack access to transportation may be unable to evacuate ahead of an emergency. (Krause & Reeves, 2017)

Low-income residents and renters are also less likely to purchase insurance, meaning that those with the most to lose during an event are also the least prepared to deal with potential losses. Major hurricane events in recent history such as Harvey, Irma, and Katrina all demonstrate that low-income and/or historically marginalized communities face increased vulnerability to hazard events and struggle the most to recover.

Median household income in the Town of Yountville was approximately $75,134, with an overall poverty rate of around 11%. By comparison, median income and poverty rates for Napa County were nearly $106,000 and 8%, respectively; refer to Table 5-2. Median income and poverty rates are also shown on the block group level in Figure 5-2 and Figure 5-3.

Table 5-2: Town fo Yountville Income and Poverty

Area	Median Income	Poverty Rate
Napa County	$105,809	7.9%
City of Napa	$100,273	8.1%
City of American Canyon	$122,694	7.4%
City of Calistoga	$96,667	5.4%
City of St. Helena	$135,781	5.7%
Town of Yountville	**$75,134**	**10.6%**

Source: ACS 5-Year, 2017-2022

Renters are also more vulnerable to natural hazards, as they are less likely to take out property insurance and the decision to make major structural improvements typically lies with the property owner. Federal disaster recovery services can exacerbate inequality between renters and homeowners; payout amounts are significantly higher for homeowners applying through FEMA's Individual Assistance (IA) program; from 1999 to 2013 U.S. homeowners saw their wealth increase with local hazard damages, whereas renters' wealth decreased. (Howell, Junia; Elliot, James, 2019)

Approximately 34.5% of occupied housing units in the Town of Yountville are renters, compared to approximately 35% for Napa County as a whole; refer to Table 5-3.

Table 5-3: Town of Yountville Renter- and Owner-Occupied Housing

Jurisdiction	# Occupied Housing Units	# Renter Occupied	% Renter Occupied	# Owner Occupied	% Owner Occupied
Napa County	49,738	17,676	35.5%	32,062	64.5%
City of Napa	26,978	10,616	39.4%	16,362	60.6%
City of American Canyon	6,192	1,371	22.1%	4,821	77.9%
City of Calistoga	2,042	822	40.3%	1,220	59.7%
City of St. Helena	2,380	1,048	44%	1,332	56.0%
Town of Yountville	**1,050**	**362**	**34.5%**	**688**	**65.5%**

Source: ACS 5-Year, 2017-2022

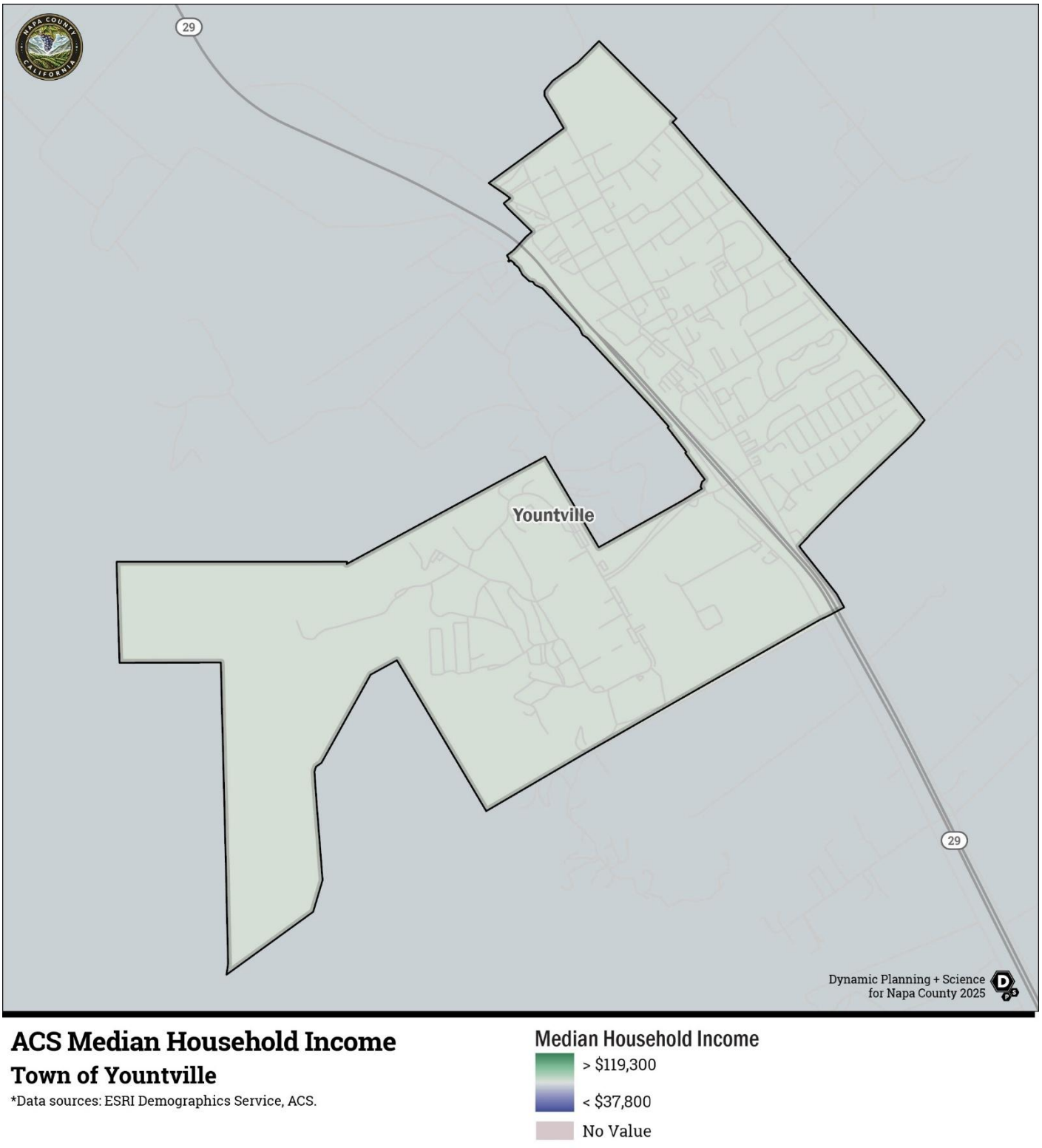


Figure 5-2: Town of Yountville Median Household Income Map

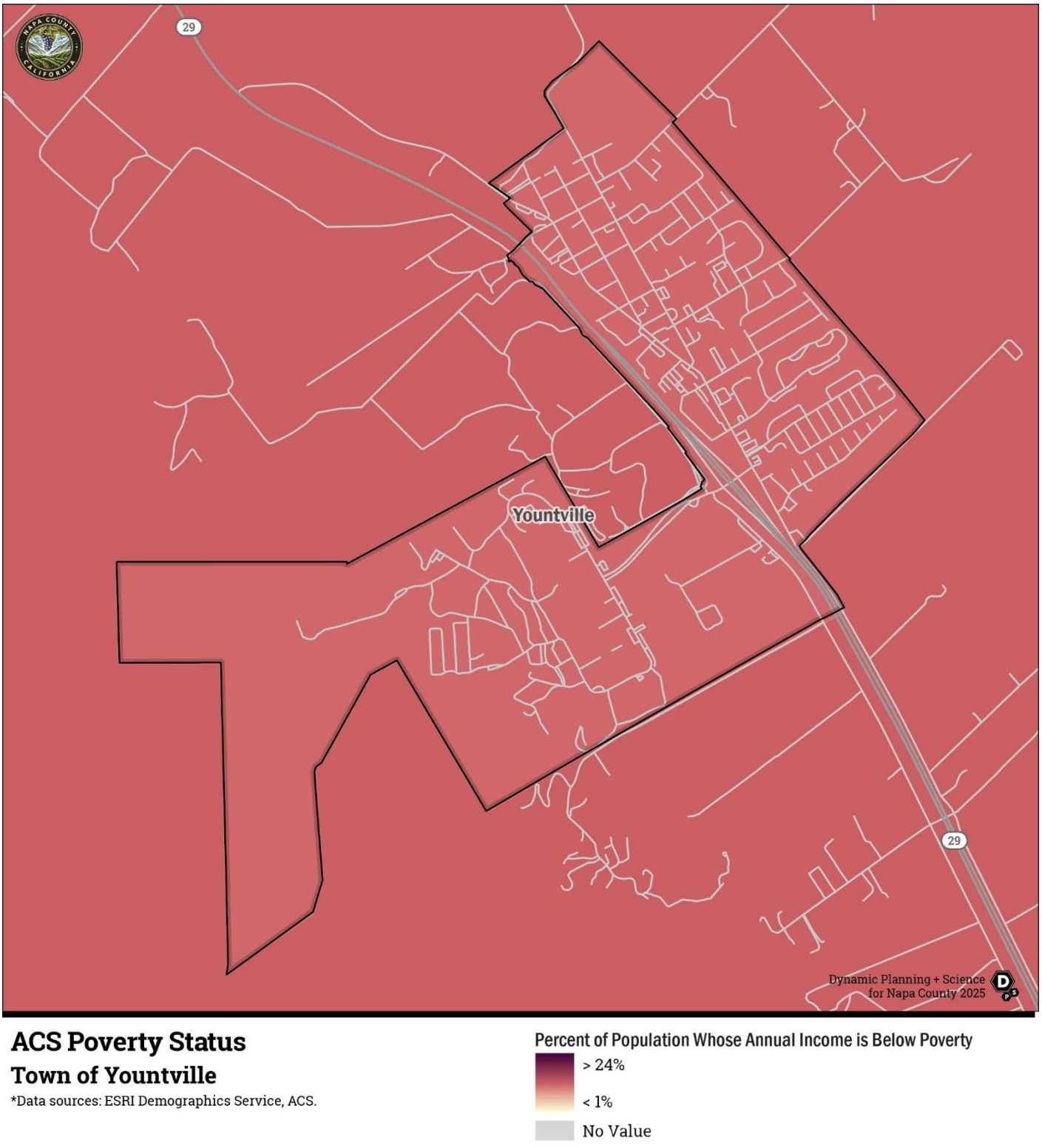


Figure 5-3: Town of Yountville Poverty Status Map

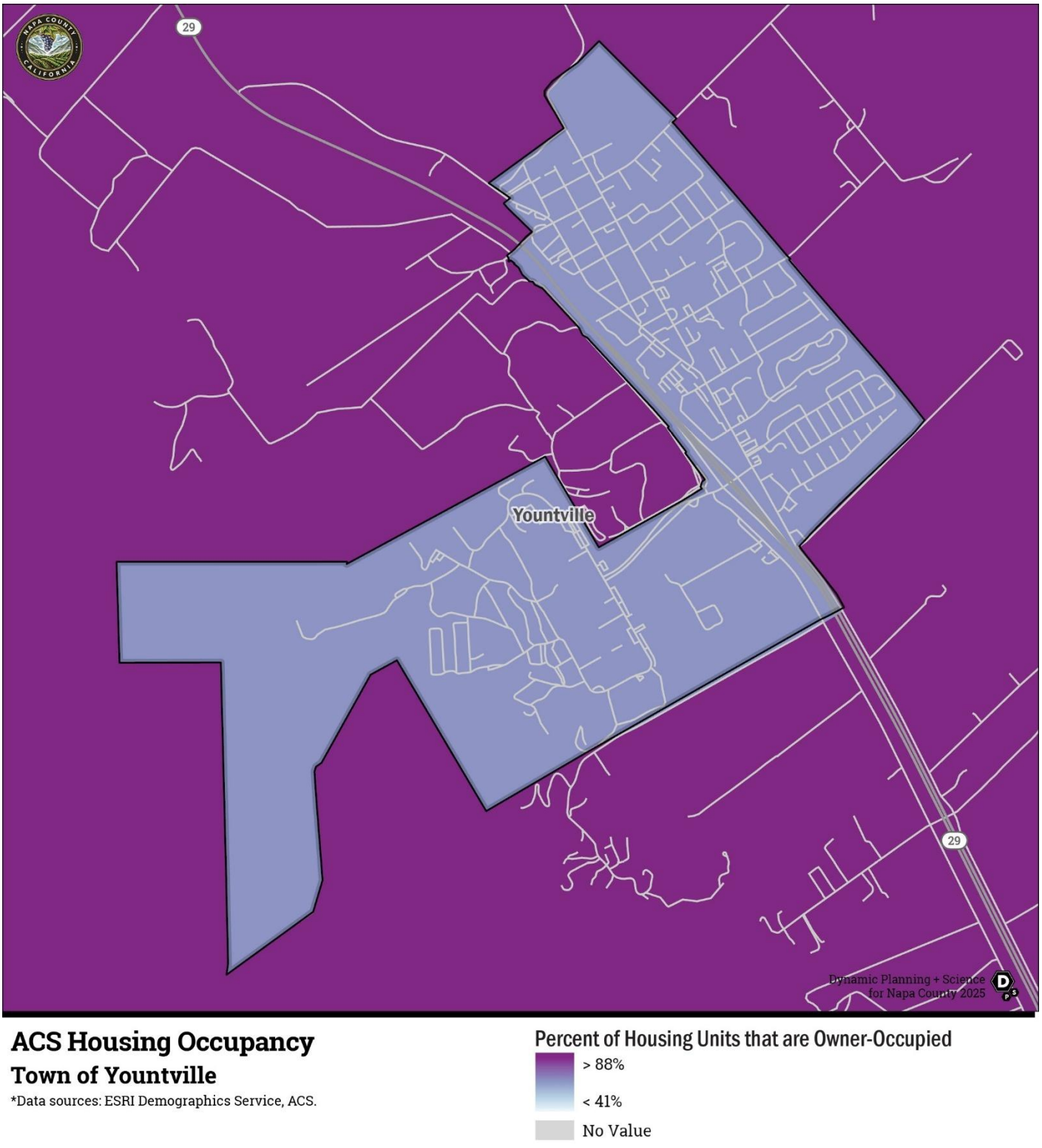


Figure 5-4: Town of Yountville Housing Occupancy Map

5.2.2.2 Dependent & Disabled Populations

Age is a significant factor in assessing vulnerability to natural hazards. Both older adults and children are considered dependent populations due to their reliance on caregivers for safety, mobility, and support during emergency events. These populations face heightened risks during disasters such as floods, wildfires, and earthquakes, particularly when compounding factors such as poverty, disability, or social isolation are present.

In the Town of Yountville, approximately 48% of households include at least one individual over the age of 65, and over 19% of all households consist of seniors living alone. While only around 4% of senior households live below the poverty line (Table 5-4), seniors, particularly those who are low-income or socially isolated, remain among the most vulnerable populations in disaster situations. Challenges for older adults may include limited mobility, chronic health conditions, reduced digital literacy, and lack of access to real-time emergency alerts. Seniors living alone may require additional assistance during evacuations or power outages, and assisted living facilities necessitate advanced coordination to ensure continuity of care and safety during emergencies.

Children represent another dependent population requiring special consideration (Table 5-5). In Yountville, nearly 9% of households include individuals under the age of 18, with zero of these households headed by a single caregiver. During emergencies, children are entirely dependent on caregivers for decision-making, transportation, and access to essential resources. Disruptions to schools, childcare, and youth services can result in significant emotional, educational, and developmental impacts. Families with limited means or single caregivers may also face greater challenges in securing housing, supplies, and recovery assistance.

Figure 5-5 highlights areas within Yountville with higher concentrations of economically dependent age groups, informing targeted outreach and response strategies during emergencies.

Table 5-4: Town of Yountville Households with Seniors

Jurisdiction	Households (HH)	65+	%	65+ Alone	%	65+ Poverty	%
Napa County	55,588	18,777	33.8%	4,816	8.7%	1,271	2.3%
City of American Canyon	5,924	1,772	29.9%	184	3.1%	111	1.9%
City of Calistoga	2,330	1,003	43.0%	419	18.0%	101	4.3%
City of Napa	31,666	10,299	32.5%	2,674	8.4%	703	2.2%
City of St. Helena	2,963	1,153	38.9%	296	10.0%	42	1.4%
Town of Yountville	**1,824**	**873**	**47.9%**	**351**	**19.2%**	**77**	**4.2%**

Source: ACS 5-Year, 2017-2022

Table 5-5: Town of Yountville Households with Children

Jurisdiction	Households	<18	%	<18 Single Caregiver	%
Napa County	55,588	14,596	26.3%	3,109	5.6%
City of American Canyon	5,924	2,633	44.4%	417	7.0%
City of Calistoga	2,330	471	20.2%	33	1.4%
City of Napa	31,666	8,934	28.2%	2,315	7.3%
City of St. Helena	2,963	619	20.9%	168	5.7%
Town of Yountville	**1,824**	**160**	**8.8%**	**0**	**0.0%**

Source: ACS 5-Year, 2017-2022

Elderly populations face increased risks during disaster events due to age-related health conditions, mobility limitations, and potential social isolation. In Yountville, approximately 20% of the non-institutionalized population lives with a disability, a substantially higher rate than the countywide average of 12% (Table 5-6).

Among those with access and functional needs, elderly individuals with disabilities represent a highly vulnerable subpopulation when it comes to disaster preparedness, response, and recovery. This group includes seniors living with physical or cognitive impairments such as hearing or vision loss, reduced mobility, reliance on assistive medical devices, neurodivergence, or chronic health conditions that may be exacerbated by hazard events (e.g., exposure to wildfire smoke or extreme heat).

Figure 5-6 illustrates that in some portions of the Town, more than 47% of the elderly population is estimated to have one or more disabilities, while other areas show lower proportions or lack available data. The spatial distribution shown on this map suggests that vulnerability is not uniform across the town and that certain neighborhoods may have greater needs for evacuation assistance, medical support, and continuity of care during emergencies. Seniors with disabilities may also be more sensitive to extended power outages, disruptions to medical services, and transportation interruptions. These risks are expected to increase under climate change conditions that intensify extreme heat events and strain emergency response resources.

The combination of advanced age and disability can present significant challenges not only during emergency response but also in implementing hazard mitigation measures. Elderly individuals with disabilities may face physical, financial, or logistical barriers to undertaking activities such as seismic retrofitting, anchoring fuel tanks, installing foundation bracing, or implementing residential flood-proofing techniques. Many live in older housing stock that is more vulnerable to earthquake damage or repetitive flooding and may lack the resources or support networks needed to complete mitigation upgrades.

Table 5-6: Town of Yountville Population with Disabilities and Access to Transportation

Jurisdiction	Population	Persons w/ Disability	%	Persons Reliant on Public Trans.	%	Households	HH w/o Vehicle	%
Napa County	137,384	16,544	12.0%	890	0.6%	55,588	2,421	4.4%
City of American Canyon	21,669	2,201	10.2%	287	1.3%	5,924	138	2.3%
City of Calistoga	5,191	573	11.0%	36	0.7%	2,330	83	3.6%
City of Napa	79,233	9,837	12.4%	291	0.4%	31,666	1,554	4.9%
City of St. Helena	5,426	683	12.6%	121	2.2%	2,963	219	7.4%
Town of Yountville	**3,397**	**683**	**20.1%**	**15**	**0.4%**	**1,824**	**210**	**11.5%**

Source: ACS 5-Year, 2017-2022

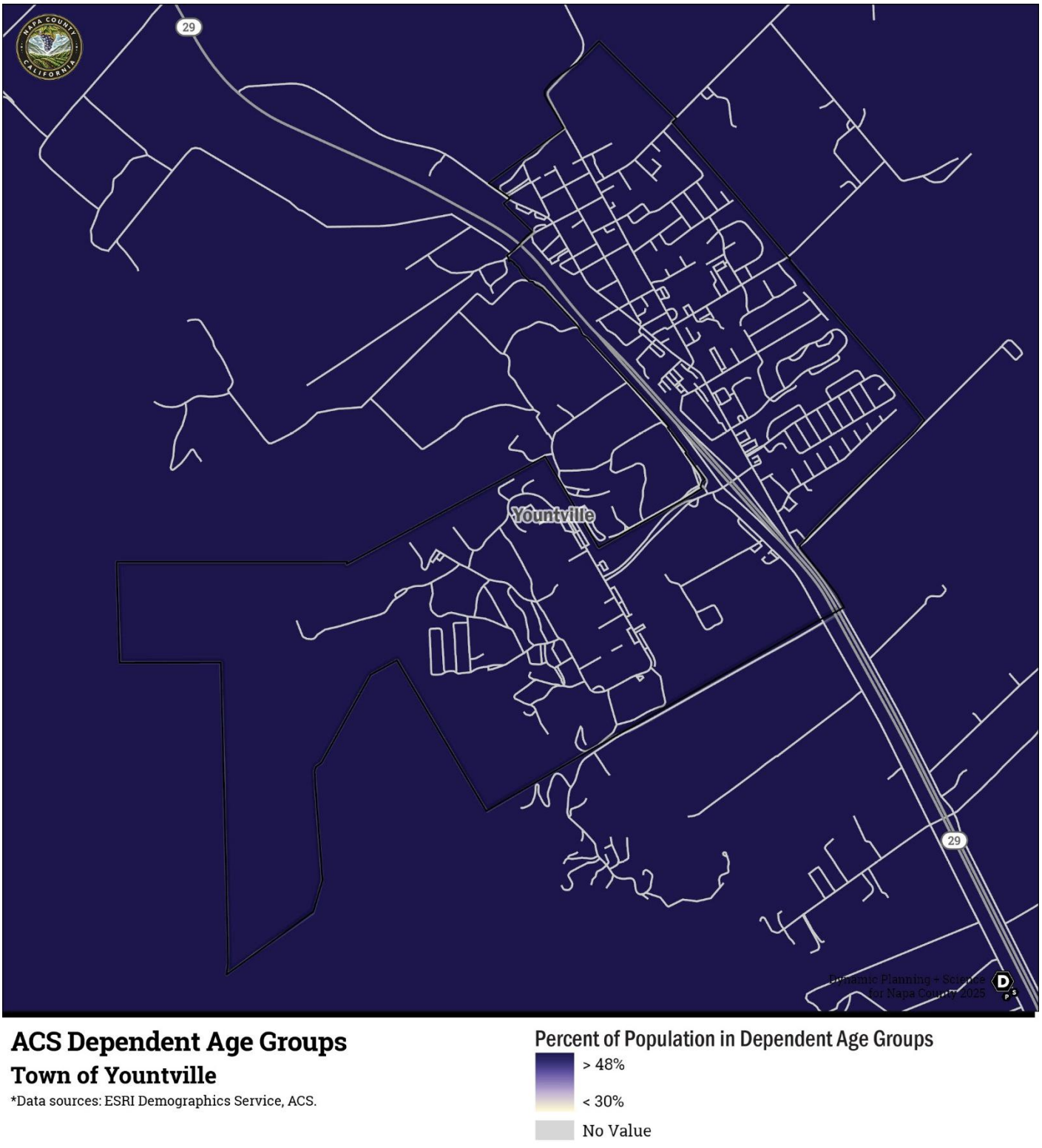


Figure 5-5: Town of Yountville Dependent Age Groups Map

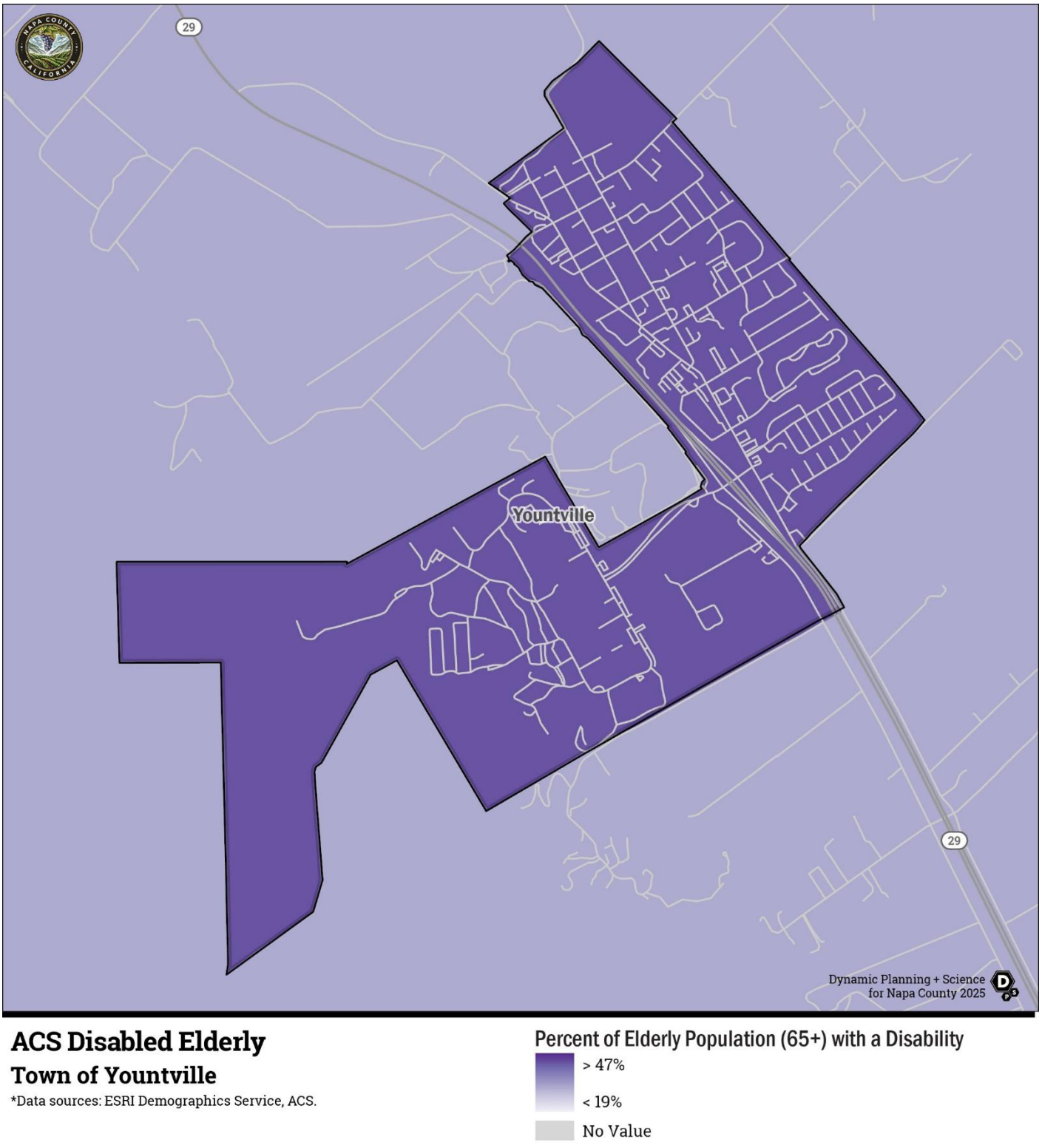


Figure 5-6: Town of Yountville Disabled Elderly Map

5.2.2.3 Race, Ethnicity & Language

Natural disasters compound racial disparities; non-white individuals and communities receive less recovery aid from FEMA than their white counterparts, even where the amount of damage is the same. (Howell, Junia; Elliott, James R., 2019) (National Advisory Council, 2020) These disparities are evidence of the complicated relationship between disaster recovery and overlapping social vulnerabilities including race, income, language, and health. Black and Latino residents are more likely to be low income and renters, conditions which create barriers to navigating FEMA's Individual Assistance programs. Communities with more non-white residents may have lower tax revenue and property values, which means less investment in mitigation and rebuilding efforts before and after an emergency.

Figure 5-7 depicts the racial and ethnic composition of the Town of Yountville. According to ACS data, the Town is mostly White, but also has a significant Hispanic or Latino population.

Residents with limited English proficiency (LEP) face heightened barriers to understanding emergency alerts, accessing preparedness resources, and navigating post-disaster recovery programs. In Yountville, approximately 3% of households speak Spanish and around 3% report limited English proficiency. (Table 5-7). Figure 5-8 highlights where Spanish-speaking populations are concentrated in Yountville.

Table 5-7: Town of Yountville Household Languages

Jurisdiction	Households (HH)	Spanish Speaking	%	Limited English	%	Other Lang.	%
Napa County	55,588	8,738	15.7%	2,141	3.9%	12	0.0%
City of American Canyon	5,924	1,069	18.0%	177	3.0%	-	0.0%
City of Calistoga	2,330	474	20.3%	63	2.7%	-	0.0%
City of Napa	31,666	5,800	18.3%	1,653	5.2%	9	0.0%
City of St. Helena	2,963	370	12.5%	88	3.0%	-	0.0%
Town of Yountville	**1,824**	**49**	**2.7%**	**21**	**1.2%**	**-**	**0.0%**

Source: ACS 5-Year, 2017-2022

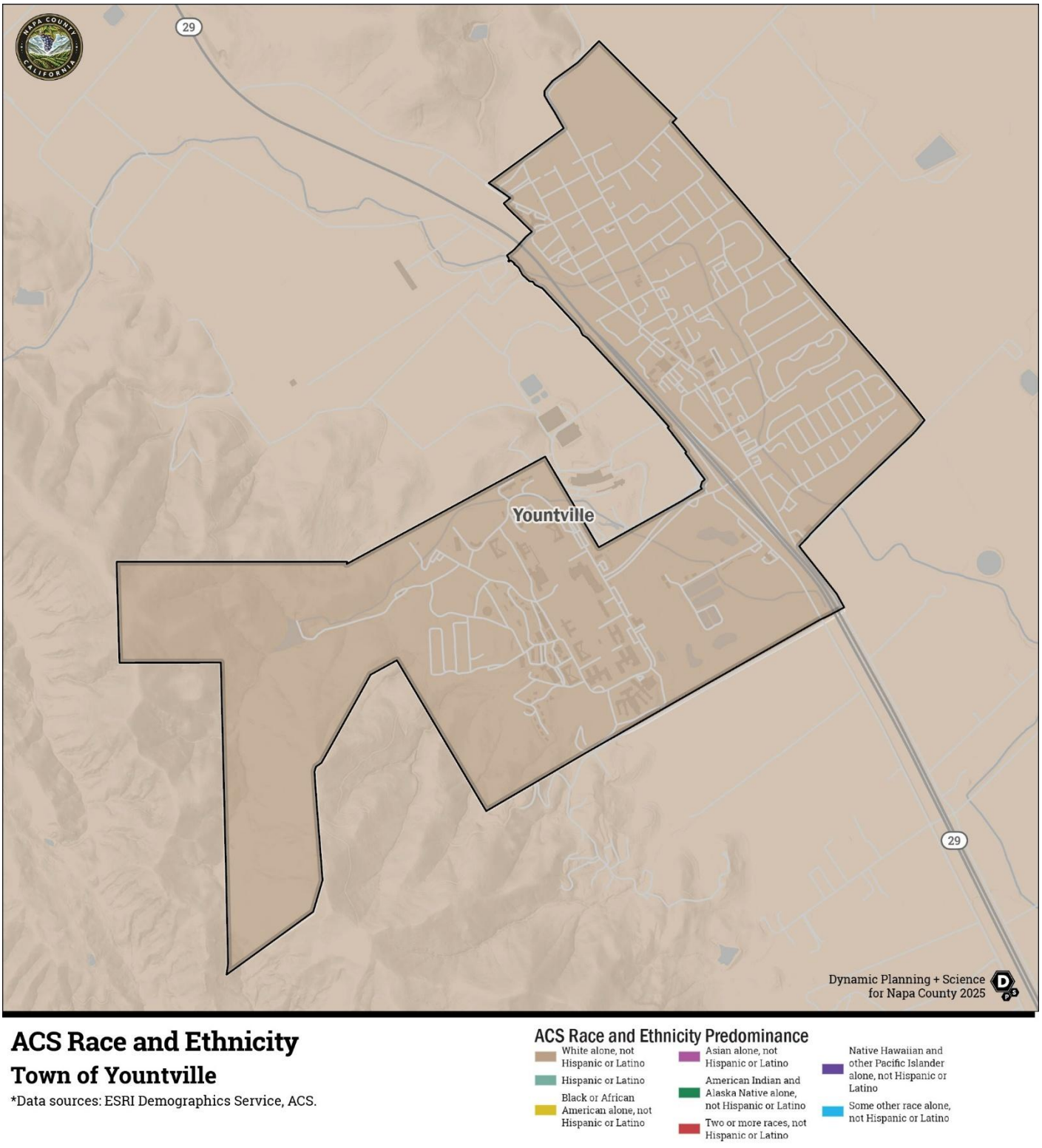


Figure 5-7: Town of Yountville Race and Ethnicity Map

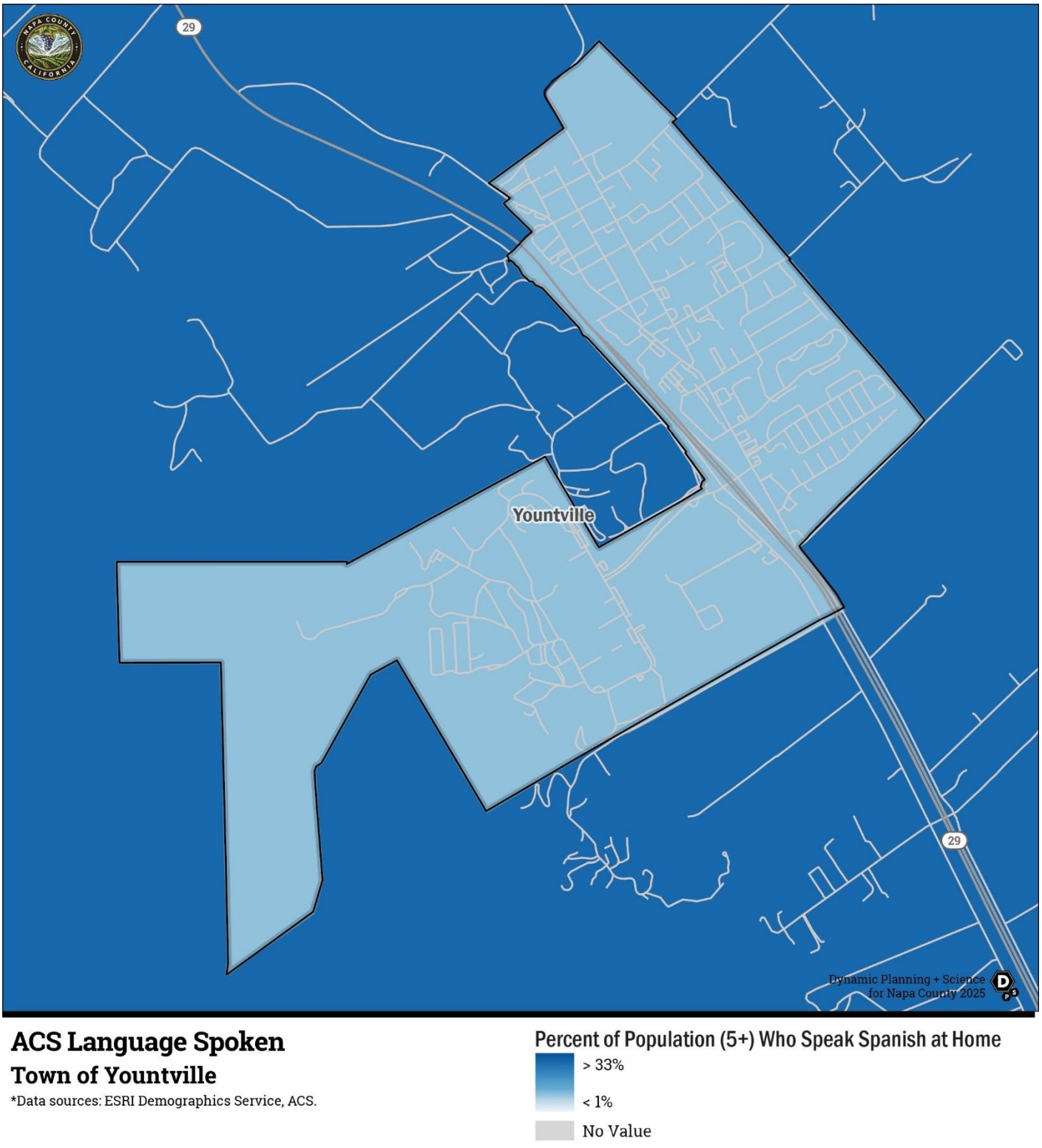


Figure 5-8: Town of Yountville Spanish-Speaking Households Map

5.2.2.4 Social Vulnerability Index (SVI)

The Centers for Disease Control and Prevention (CDC) Social Vulnerability Index (SVI) for Town of Yountville reveals important spatial and demographic patterns that have direct implications for equitable hazard mitigation planning. As discussed in detail in Volume 1, Section 1.4.3.6, the SVI is a composite measure developed by the CDC to identify communities that are more likely to require support before, during, and after a disaster. It incorporates a range of factors across four key dimensions: socioeconomic status, household composition and disability, minority status and language, and housing type and transportation access. The resulting index score ranges from 0 (lowest vulnerability) to 1 (highest vulnerability).

Figure 5-9 shows that social vulnerability ranges between 0.50 and 1.00 in Yountville, which is indicative of moderate to high SVI. Areas with higher SVI values indicate neighborhoods where residents may have reduced capacity to prepare for, respond to, and recover from hazard events due to factors such as lower income, higher proportions of renters, limited access to vehicles, language barriers, or greater concentrations of elderly and disabled individuals. Conversely, areas with lower SVI scores generally reflect populations with greater access to resources and adaptive capacity.

Spatial patterns in the SVI map suggest that higher social vulnerability is concentrated in portions of the central and southern areas of the town, where multiple vulnerability indicators overlap. These areas may experience disproportionate impacts during events such as flooding, extreme heat, earthquakes, or wildfire smoke episodes, particularly if hazards coincide with power outages, transportation disruptions, or prolonged recovery periods. Residents in higher-SVI neighborhoods may also face challenges accessing emergency information, evacuation assistance, sheltering, and post-disaster financial or housing resources.

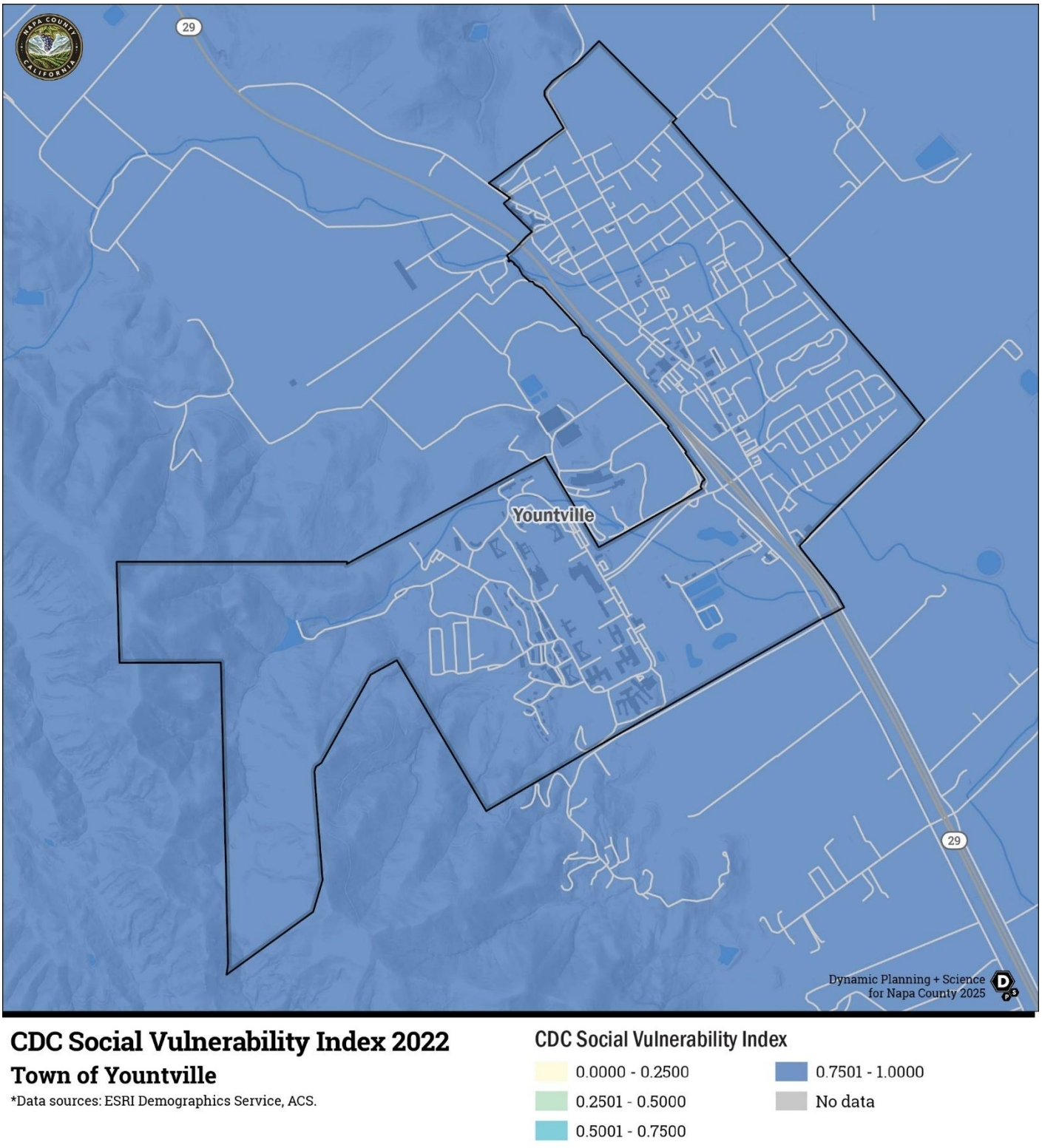


Figure 5-9: Town of Yountville CDC Social Vulnerability Index Map

5.2.3 Economy

The Town of Yountville plays a unique economic role within central Napa County. Although the Town is small, it does have a major employer—the Veteran's Home of California, Yountville—and a significant visitor-serving commercial tax base. Notable visitor-serving businesses include The French Laundry and several upscale lodging establishments.

Retail, restaurants, and visitor-serving commercial uses are primarily concentrated on Washington Street. These businesses contribute significantly to local tax revenues and provide jobs for residents of Yountville and surrounding communities. At the same time, the concentration of economic activity along Washington Street increases the importance of protecting critical infrastructure, transportation corridors, and utility systems from natural hazards such as flooding, earthquakes, and power outages.

The Town's commercial economy includes neighborhood-serving retail, restaurants, and personal services that support daily needs and contribute to community vitality. These businesses are particularly sensitive to hazard-related disruptions, as temporary closures, infrastructure damage, or reduced access can result in lost income and longer-term economic impacts. Small businesses may have limited capacity to absorb prolonged disruptions, making economic resilience an important consideration in hazard mitigation planning.

A significant portion of Yountville's workforce is employed in sectors that involve physical labor or outdoor activity, including agriculture and visitor-serving commercial uses. These workers may face heightened exposure to hazards such as extreme heat, wildfire smoke, and poor air quality. Climate change projections indicating more frequent heat events and longer wildfire seasons have implications for worker safety, productivity, and business continuity within these sectors.

Economic vulnerability is also influenced by income variability and employment stability. Workers in hourly or service-based positions may experience immediate income loss during disaster-related closures or evacuations, which can compound household vulnerability and slow community recovery. Protecting employment centers, maintaining transportation access, and ensuring continuity of utilities and communications are therefore key components of reducing economic disruption from hazard events.

5.2.4 Growth Trends & Future Development

The Town of Yountville has experienced moderate growth since the 1970s, with development patterns shaped by adopted growth management policies, infrastructure capacity, and regional housing demand. Growth in recent decades has occurred primarily through planned residential development and visitor-serving commercial uses. This approach reflects the Town's long-standing emphasis on directing growth toward areas that can be efficiently served by public services and infrastructure while limiting outward expansion into agricultural and environmentally sensitive lands.

Residential growth has been driven largely by approved specific plans and infill development within existing neighborhoods. Recent development activity has included a mix of single-family and multi-family

housing intended to accommodate population growth and meet state-mandated housing requirements. The Town's Housing Element and Annual Progress Reports document continued efforts to increase housing supply while addressing affordability, infrastructure demands, and community character.

Future development in Yountville is expected to continue focusing on buildout of remaining developable parcels within the Urban Limit Line and Sphere of Influence. Planned growth areas are generally located near existing transportation corridors, utilities, and employment centers, supporting more compact and efficient development patterns. This strategy reduces the need for extensive new infrastructure and helps limit exposure to hazards associated with hillside development, wildfire risk, and access constraints.

Economic development is also anticipated to remain a key component of future growth. Expansion and intensification of industrial and commercial uses, particularly those related to logistics, manufacturing, and the wine industry, are expected to support employment and fiscal stability. At the same time, continued development in low-lying areas and near critical transportation routes underscores the importance of incorporating hazard mitigation and climate adaptation measures into future land use and infrastructure planning.

5.3 Planning Process

The Town of Yountville followed the planning process detailed in Volume 1, Section 2, including participating in the county-wide Hazard Mitigation Planning Team (HMPT) and formulating their own internal planning team to support the broader planning process.

The town's representatives in the Steering Group led stakeholder and public engagement efforts alongside the Consultant Team, with assistance from the county-wide HMPT and their internal planning team. This engagement process is described in Volume 1. Specifically, for the Town of Yountville, this included postings to the town website and social media, and outreach events, as documented in Appendix B. Examples of Key Stakeholders engaged by Napa County on behalf of the Town with relevance to the development of Yountville's mitigation strategy include the USDA and other federal agencies; CAL FIRE and other state agencies; other neighboring jurisdictions; community-based organizations such as the Chamber of Commerce; utility providers like PG&E; UC Davis and other academia; and local businesses.

All Key Stakeholders that were invited to participate in the planning process are listed in Volume 1, Section 2, and the input received from stakeholders was integrated into the town's annex, as described in Volume 1 Table 2-9. The town's internal planning team participants, their positions, and how they participated in the planning process are shown in Table 5-8.

Table 5-8: Town of Yountville Planning Team and Steering Group Members

Team Members	Title	Description of Involvement
Hilary Gaede	**Communications Director / Town Clerk**	**Lead Point-of-Contact, HMPT #1 and #2, BO #1 and #2**
John Ferons	**Public Works Director**	**Alternate Point-of-Contact, HMPT #4**
Beatriz Becerra	Management Fellow	Participating Stakeholder, BO #1
Diane Levine	Associate Planner	Participating Stakeholder, BO #1
Jacob Solis	Engineering Tech – Geographic Information Systems	Participating Stakeholder, BO #1 and #2

Town of Yountville participated in a comprehensive hazard mitigation planning process as part of the 2026 Napa County MJHMP update. This included a series of breakout meetings, listed in Table 5-9 that engaged the district's planning team, which included key town personnel and stakeholders in evaluating hazards, identifying local vulnerabilities, and prioritizing mitigation strategies.

The process began with a County-Wide Steering Group Kickoff Meeting on February 28, 2024. This initial meeting focused on welcoming participants, establishing a shared understanding of the project scope and schedule, clarifying roles and responsibilities of the Steering Group, the county-wide Hazard Mitigation Planning Team (HMPT), and individual jurisdictional planning teams, and included a review of key changes since the 2020 Local Hazard Mitigation Plan The meeting set the foundation for coordinated participation throughout the planning effort.

On June 18, 2025, participants engaged in a hexagon mapping activity designed to visually identify mitigation actions that could benefit from or require inter-jurisdictional coordination. These collaborative efforts helped shape a refined set of mitigation alternatives, establish shared planning goals, and align local strategies with FEMA's Hazard Mitigation Assistance (HMA) funding framework.

During the November 6, 2025, breakout out meeting, discussions concentrated on community engagement outcomes, initial risk assessments, and the integration of demographic data to better understand vulnerable populations. Jurisdictional teams reviewed their specific hazard exposures using the Risk Assessment Mapping Platform (RAMP) and participated in prioritization exercises to identify their top hazards.

The November 19, 2025, breakout meeting shifted toward reviewing local capabilities and defining specific areas of concern, which informed the drafting of problem statements. Teams worked collaboratively to refine mitigation alternatives, align actions with FEMA guidelines, and develop a shortlist of priority mitigation actions and inter-jurisdictional collaboration opportunities.

Table 5-9: Town of Yountville Planning Team Meetings

Meeting & Date	Agenda / Topics	Goals / Key Inputs
County-Wide Steering Group and HMPT Kick-off and Meetings #1 & #2 February 28, 2024– July 18, 2024		
Yountville Planning Team Breakout Meeting #1 November 6, 2025	▪ County-wide HMPT meetings #1 and #2 recaps ▪ Community engagement progress and results ▪ Risk assessment and community vulnerability ▪ Demographics and vulnerable populations ▪ Overview of jurisdiction-specific hazard risks and exposure ▪ Introduction to Risk Assessment Mapping Platform (RAMP) ▪ Jurisdiction-specific hazard risk ranking exercise ▪ Project schedule updates and next steps	▪ Consensus on jurisdiction-specific priority hazards ▪ Identify capabilities and potential mitigation actions ▪ Community engagement volunteers
County-Wide HMPT Meeting #3 March 25, 2025		
Yountville Planning Team Breakout Meeting #2 November 19, 2025	▪ Breakout Meeting #1 and HMPT #3 recaps ▪ Review capabilities assessment ▪ Review areas of concern and define problem statements ▪ Principles of effective mitigation strategies and actions, and mitigation alternatives ▪ Refine and align jurisdiction-specific mitigation actions exercise ▪ Project schedule updates and next steps	▪ Consensus on jurisdiction-specific capabilities ▪ Consensus on jurisdiction-specific areas of concern ▪ Consensus on priority mitigation actions and collaboration opportunities ▪ Community engagement volunteers
County-Wide HMPT Meeting #4 December 10, 2025		

5.3.1 Public Input & Draft Review

As detailed in Volume 1, Section 2, the draft plan was available for public review and comment from May 15 to June 2, 2026. Public comments received during that time were similar to those gathered throughout the public engagement process, including the need for more equity in the distribution of mitigation activities and funding and the need for enhanced cooperation among jurisdictions, utility providers, and state agencies. These comments were incorporated into the Town's mitigation strategy, as appropriate; although, most were already addressed by the Mitigation Action Plan which was based on previous public input.

Public and stakeholder input was gathered and incorporated throughout the plan development process, before the public review period, such as from the online public survey (see Volume 1, Section 2.1.2 and Appendix B, for details). During the review period, jurisdictional staff and stakeholders that participated in the plan development also reviewed the public draft and provided comments on minor corrections and revisions, which were addressed in the final plan.

5.4 What's New

This section provides an overview of hazard mitigation planning efforts for the planning area and highlights the updates made in the 2026 MJHMP. The Town of Yountville previously participated and maintained a Hazard Mitigation Plan, which guided resilience planning and hazard mitigation actions at the Town level. Yountville is updating their current plan on a county wide level. This integration reflects the Town's ongoing commitment to regional resilience and acknowledges that many hazards such as flooding, severe storms, and earthquakes cross jurisdictional boundaries.

Through participation in the MJHMP, Yountville has identified its highest priority hazards, developed hazard specific problem statements, and proposed actionable strategies to reduce risks. By aligning with countywide partners and leveraging regional resources, Yountville has strengthened its capacity to prepare for, withstand, and recover from disasters while continuing to protect its unique community character.

5.4.1 Mitigation Activities

The town has successfully implemented several initiatives aimed at addressing identified vulnerabilities. Some of these accomplishments are highlighted in this section and have directly contributed to reducing risks from hazards such as flooding, all hazards, and severe weather. These completed projects showcase Yountville's ability to effectively plan, fund, and execute measures that protect its residents and infrastructure.

In addition, Yountville has systematically reviewed and adjusted its mitigation actions, exemplifying adherence to FEMA's Planning Policy Guide principles and emphasizing the importance of dynamic and adaptive mitigation planning. By fostering partnerships, leveraging funding opportunities, and prioritizing equity in implementation, the Town aligns with best practices to build resilience against natural disasters. This ongoing effort is a testament to the Town's commitment to the principles of risk-informed decision-making, equitable resource allocation, and integration with broader regional and state hazard mitigation objectives.

Adjustments to Previous Mitigation Actions

A significant portion of the Town's mitigation efforts remain ongoing or in the pipeline. These actions, ranging from infrastructure upgrades to community outreach initiatives, represent the Town's proactive approach to addressing hazards as resources become available.

Recognizing constraints such as limited funding, staffing, and shifting priorities, the Town has reevaluated certain initiatives, leading to their reprioritization or canceling of mitigation actions. Factors such as feasibility, cost-effectiveness, and emerging risks informed these decisions, ensuring alignment with the Town's updated hazard mitigation goals. Adjustments to previous mitigation actions are documented as part of the Town of Yountville's Mitigation Action Plan Table 5-16, and more specific status updates are provided in Table 5-17.

5.4.2 Mitigation Successes

Since the adoption of the 2021 Hazard Mitigation Plan, the Town of Yountville has made measurable progress in implementing mitigation actions that reduce risk and enhance community resilience. These successes reflect the town's continued commitment to integrating hazard mitigation into local planning, capital improvement projects, and community programs.

The following success story highlights ongoing efforts to address key hazards such as wildfire-related power disruptions, infrastructure vulnerability, and climate change impacts. Collectively, this initiative demonstrates the Town's ability to move from planning to implementation by leveraging partnerships, securing federal funding, and advancing innovative projects that provide long-term risk reduction benefits to the community.

Energy Resilience through Microgrid Development

The Town of Yountville has advanced a Resiliency Microgrid Project to improve energy reliability and continuity of operations during emergency events, including wildfires and public safety power shutoffs. In April 2026, the Town secured $250,000 in federal funding to support the development of the microgrid, demonstrating a strong commitment to proactive hazard mitigation and climate resilience.

The microgrid project is designed to integrate renewable energy sources and battery storage systems to create a localized power network capable of operating independently from the traditional electrical grid. During grid outages caused by wildfire events, extreme weather, or other disruptions, the microgrid will provide reliable, uninterrupted power to support critical community functions and maintain essential services.

This project directly addresses the Town's vulnerability to power disruptions associated with wildfire risk and regional grid instability, which have increasingly affected communities throughout Napa County. By enhancing local energy independence, the microgrid reduces reliance on external infrastructure and strengthens the Town's ability to maintain operations during emergency conditions.

In addition to improving emergency preparedness, the project supports broader sustainability and climate adaptation goals by incorporating clean energy technologies and reducing long-term environmental impacts. The microgrid represents a forward-looking, infrastructure-based mitigation strategy that enhances resilience, protects public safety, and ensures continuity of essential services for residents and businesses.

This effort highlights the Town of Yountville's ability to leverage external funding, implement innovative solutions, and translate hazard mitigation planning into tangible, long-term resilience investments.

Updated Safety Element

The Safety Element update includes multiple mitigation-forward policies such as tailored evacuation messaging for single-access neighborhoods, assessing ingress/egress improvements, zone-based

evacuation planning, siting critical infrastructure outside hazard zones where feasible, and maintaining participation in the Napa County MJHMP update cycle.

5.5 Risk Assessment

This section focuses on profiling hazards specific to the Town of Yountville and assessing their vulnerability independent of the broader county-wide planning area, which has been evaluated in Section 3 of Volume 1. The hazard profiles in Volume 1 discuss overall impacts to the planning area and describe relevant plans, policies, and regulations; past events; location; frequency and probability of future occurrences; severity and extent; warning time; secondary hazards; and climate change impacts. For more information on risk assessment methodologies, see Volume 1, Appendix A.

This section includes a tailored vulnerability assessment, analyzing assets at risk such as population, property, and critical facilities and infrastructure unique to the town, and information on town-specific differences in hazard vulnerability across the planning area. It also identifies total Town assets at risk, including people, property, and critical facilities and infrastructure within the Town. In addition, this section presents growth and development trends for the community, offering insights into vulnerabilities and risks that represent the broader context of assets at risk.

5.5.1 Hazard Screening & Prioritization

Members of the Planning Team from each participating jurisdiction came together to collaboratively decide which county-wide hazards would be included in the MJHMP, and which would be excluded. Hazard screening and prioritization took place early in the process and integrated historic data, local knowledge, and consensus opinions to create a risk assessment matrix for the county as well as for each participating jurisdiction. These matrices indicate the priority of hazards prior to further refinement. Details about this process, the results of the discussion, and in-depth profiles for county-wide hazards can be found in Volume 1, Sections 2 and 3.

The Town of Yountville's internal planning group used the same hazard identification and prioritization process as the county-wide Planning Team. They reviewed previously prepared hazard mitigation plans and other relevant documents to determine the realm of natural hazards that have the potential to affect the town. Table 5-10 provides a crosswalk of hazards identified in select planning documents, including the 2020 Napa County MJHMP, the Town of Yountville General Plan, and the 2023 State of California HMP. The crosswalk was used to develop a preliminary hazards list, providing a framework for the group to evaluate which hazards were truly relevant to the Town of Yountville and which ones were not.

The internal planning group then ranked hazards based on their probability of affecting Town of Yountville and potential impacts on the community. Figure 5-10 displays the results of the hazard risk ranking exercise that was performed before further refinement. All hazards have been profiled in Volume 1 of this document. The purpose of this annex is to specifically address the Town's vulnerability to specifically identified hazards.

Table 5-10: Town of Yountville Document Review of Potential Hazards

Hazard	2020 Napa County MJHMP	Town of Yountville General Plan	2023 California SHMP
Agricultural Pests	■		■
Avalanche			■
Climate Change	■	■	■
Coastal			■
Dam Failure	■	■	■
Drought	■	■	■
Earthquake / Liquefaction	■	■	■
Extreme Cold			■
Extreme Heat		■	■
Extreme Weather / Storms	■	■	■
Flood	■	■	■
Geologic / Mass Movement	■	■	■
Human-Caused			■
Insects			■
Levee Failure			■
Pandemic Disease	■		■
Sea Level Rise			■
Soil			■
Subsidence			■
Tornado			■
Tsunami / Seiche Wave			■
Volcano			■
Wildfire	■	■	■

Risk Assessment Matrix Definitions

PROBABILITY RATING

The likelihood of a hazard event occurring within a time period?

PROBABILITY

- **Highly Likely** - 100% annual probability. Or Likely to occur every year in your lifetime.
- **Likely** - between 10 & 100% annual probability. Or will occur several times in your lifetime.
- **Possible** - between 1 & 10% annual probability. Or Likely to occur some time in your lifetime.
- **Unlikely** - less than 1% annual probability. Or unlikely but possible to occur in your lifetime.

IMPACT RATING

In terms of injuries, damage, or death, would you anticipate impacts to be minor, limited, critical, or catastrophic when a significant hazard event occurs? The impact could be in terms of one hazard event (flooding from a culvert failure) or a large-scale event (multiple rivers flooding) in the same jurisdictional boundary.

IMPACT

Minor	Limited	Critical	Catastrophic

Minor - very few injuries, if any. Only minor property damage & minimal disruption on quality of life. Temporary shutdown of critical facilities.

Limited - minor injuries only. Approx. 10% or less of property in disaster footprint damaged or destroyed. Complete shutdown of critical facilities for more than one day.

Critical - multiple deaths/injuries possible. Between 25% and 50% of property in disaster footprint is damaged or destroyed. Complete shutdown of critical facilities for more than one week.

Catastrophic - high number of deaths/injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for 30 days or more.

To concentrate resources, the jurisdictional planning team will focus on "High" and "Extreme" risk hazards, and "Medium" risk hazards to a lesser extent. These hazards have the higher probability and greater impact as it relates to the jurisdictions planning area.

Hazard definitions are included in **Vol. 1** of this plan. Some hazards are discussed as subset hazards— e.g., "Levee Failure" within the "Flood" hazard profile. If a hazard is not present on the risk matrix, is grey, or categorized as a "Low" risk hazard, the jurisdictional planning team felt the hazard had a minimal footprint or impact within their planning area and chose not to profile the hazard.

Hazard Information / Legend:

CLIMATE CHANGE

Climate Change impacts will be addressed within each relevant hazard section within the plan update and as a stand alone section for each jurisdiction. Climate change may change the frequency, duration, or intensity of other hazards profiled.

Town of Yountville Risk Matrix

PROBABILITY \ IMPACT	Minor	Limited	Critical	Catastrophic
Highly Likely	FLOOD	EXTREME HEAT, SEVERE WEATHER, DROUGHT	Extreme	Extreme
Likely	Medium	High	EARTHQUAKE	Extreme
Possible	Low	Medium	WILDFIRE	High
Unlikely	Low	Low	DAM FAILURE	Medium

Figure 5-10: Town of Yountville Risk Assessment Matrix

Note: Hazard naming in the Risk Assessment Matrix may not match the final naming used. Refer to hazards prioritization summary table.

Priority Hazards

The results of the initial risk ranking exercise completed by the town's Planning Team, before further refinement, are identified in the county's completed matrix in Figure 5-10. Table 5-11 provides the final list of priority hazards and subhazards with additional details about why certain hazards were chosen and why others were not prioritized. However, it should be noted that many hazards not prioritized for profiling are briefly discussed as secondary or compounding hazards, and subhazards that were profiled and included in the risk assessment are listed specifically.

Table 5-11: Town of Yountville Hazards Prioritization Summary

Hazard	Priority	Explanation
Earthquake / Liquefaction	**High**	Profiled in Volume 1, Section 3.3.4, and Section 5.5.2.2 in this annex, including Liquefaction
Wildfire	**High**	Profiled in Volume 1, Section 3.3.1, and Section 5.5.2.1 in this annex
Flood	**Medium**	Profiled in Volume 1, Section 3.3.2, and Section 5.5.2.3 in this annex
Levee Failure	-	Profiled in Volume 1, Section 3.3.2; not a priority due to low probability and impact potential
Extreme Weather / Storms	**High**	Profiled in Volume 1, Section 3.3.5, and Section 5.5.2.7 in this annex as Severe Weather, including High Wind and Heavy Rain (Winter Weather not a priority due to low probability and impact potential)
Drought	**High**	Profiled in Volume 1, Section 3.3.6, and Section 5.5.2.5 in this annex
Geologic / Mass Movement	-	Profiled in Volume 1, Section 3.3.5; not a priority due to low probability and impact potential
Extreme Heat	**High**	Profiled in Volume 1, Section 3.3.8, and Section 5.5.2.4 in this annex
Agricultural Pests	-	Profiled in Volume 1, Section 3.3.9; not a priority due to low probability and impact potential and jurisdictional focus
Sea Level Rise	-	Profiled in Volume 1, Section 3.3.9; not a priority due to no exposure
Climate Change	**High**	Profiled in Volume 1, Section 3.3.9, and Section 5.5.2.8 in this annex
Dam Failure	**Medium**	Profiled in Volume 1, Section 3.3.3, and Section 5.5.2.6 in this annex

5.5.2 Vulnerability to Specific Hazards

Assessing vulnerabilities exposes the unique characteristics of individual hazards and begins the process of narrowing down which areas within the town are vulnerable to specific hazard events. The vulnerability assessment considered unique local knowledge of hazards and impacts and a GIS overlaying method for examining such vulnerabilities in more depth. Using these methods, the town's planning group estimated vulnerable populations, properties, and assets, and potential losses. In addition, the exposure of town assets to drought, geological, earthquake, wildfire and flood hazards were also considered.

Many of the hazard profiles include a snapshot map and damage estimation tables that illustrate the Town's vulnerabilities to those specific hazards. These maps assisted the planning group in understanding the hazard exposure of populations, parcels, and critical facilities and infrastructure. Each snapshot map contains an exposure summary that displays the percentage of the population, the improvement and content value of parcels, and the amount of critical infrastructure that is exposed. For hazards without geospatial extents, such as drought and severe weather, narratives are provided instead of exposure maps and tables.

Based on the hazard prioritization exercise, this vulnerability assessment focuses on seven hazards for the Town of Yountville, some of which encompass sub hazards such as Liquefaction and Heavy Rain

Wildfire
SECTION 5.5.2.1



Earthquake
SECTION 5.5.2.2



Flood
SECTION 5.5.2.3



Extreme Heat
SECTION 5.5.2.4



Drought
SECTION 5.5.2.5



Dam Failure
SECTION 5.5.2.6



Severe Weather
SECTION 5.5.2.7



Climate Change
SECTION 5.5.2.8



5.5.2.1 Wildfire Hazard

Wildfire risk in the Town of Yountville is primarily concentrated along the western edge of the community, where developed areas interface with open space, and the Mayacamas Mountains. The wildfire risk exposure map, Figure 5-11, shows that portions of the Town and surrounding Sphere of Influence are located within Moderate and High Fire Hazard Severity Zones, particularly in areas adjacent to undeveloped land and wildland vegetation.

High wildfire hazard areas are also present along portions of the Town's western edge near the Mayacamas Mountains. Seasonal drying of vegetation and wind conditions can exacerbate localized wildfire risk, particularly during extended drought periods. The eastern portion of Yountville has no wildfire hazard because it is on the Napa Valley floor away from any hillsides.

The exposure summary associated with the wildfire risk map indicates that, within current mapped hazard areas, there are no permanent residential populations, parcels, or critical infrastructure classified within the Very High Fire Hazard Severity Zone inside town limits. As a result, population exposure, parcel exposure, and critical infrastructure exposure rates within the highest hazard category are reported at 289 persons and 26 parcels. This reflects Yountville's relatively urbanized development pattern and limited extent of very high-risk wildfire terrain within incorporated boundaries.

Despite the small amount of Very High Fire Hazard Severity Zones within the Town, wildfire remains an important planning consideration due to proximity to higher-risk areas outside town limits, regional wildfire activity, and secondary impacts such as smoke exposure, power shutoffs, transportation disruptions, and evacuation demands. Climate change projections indicating hotter temperatures, longer dry seasons, and increased frequency of extreme weather events are expected to exacerbate wildfire conditions throughout Napa County, including areas surrounding Yountville.

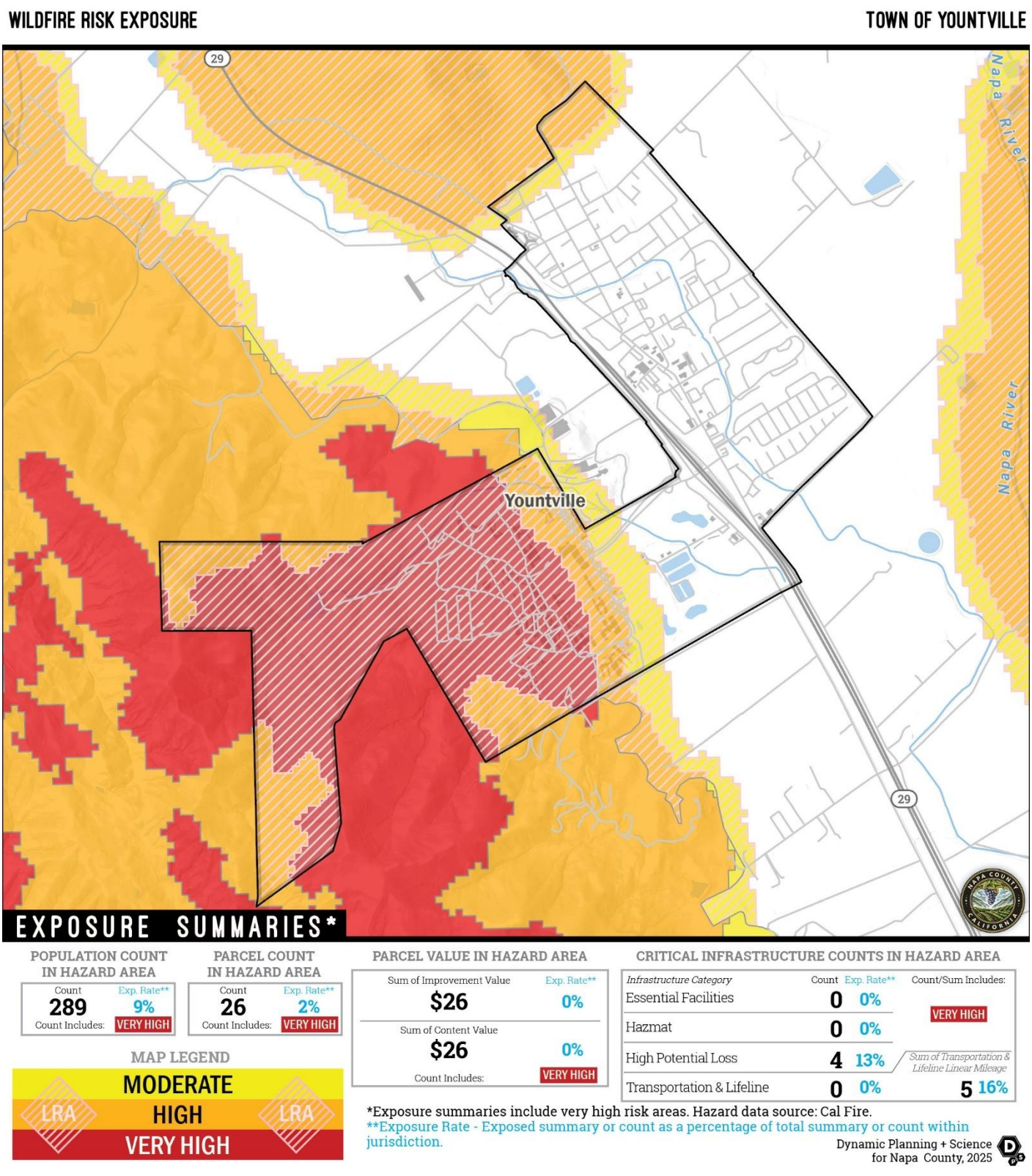


Figure 5-11: Exposure Summary – Yountville Wildfire Risk

5.5.2.2 Earthquake Hazard

The Town of Yountville is subject to significant earthquake risk due to its location within the seismically active San Francisco Bay Area and proximity to multiple active faults in Napa County and the surrounding region. Earthquake impacts in the Town are best illustrated through scenario modeling, including the Hunting Creek–Berryessa Earthquake Scenario (Magnitude 7.1) and the West Napa Earthquake Scenario (Magnitude 6.7). These scenarios reflect credible seismic events that could produce strong to severe ground shaking throughout the Town.

Under the Hunting Creek–Berryessa M7.1 scenario (Figure 5-12), ground shaking across Yountville is generally characterized as Very Strong and Severe (Modified Mercalli Intensity [MMI] VII – VIII). Exposure summaries indicate that approximately 2,900 residents, more than 1,250 parcels, and nearly $613 million in building improvement value and $443 million in content value fall within these intensity ranges. In addition, all mapped critical infrastructure categories, including essential facilities, hazardous materials sites, high potential loss facilities, and transportation and lifeline systems, are exposed to damaging levels of ground shaking.

The West Napa Earthquake M6.7 scenario, Figure 5-13, represents an even more impactful event for Yountville. Under this scenario, 100 percent of the Town's population, parcels, and assessed parcel value are exposed to Very Strong to Severe (MMI VII - VIII). Exposure summaries indicate that approximately 3,400 residents, 1,300 parcels, and nearly $617 million in building improvement value and $445 million in content value fall within these intensity ranges.

While exposure summaries indicate no population, parcels, or critical infrastructure located in the highest modeled intensity categories for this scenario within Town limits, the widespread nature of strong shaking suggests the potential for damage to buildings, infrastructure, and lifelines, particularly older structures and non-ductile construction.

Earthquake impacts associated with these scenarios include structural damage to residential, commercial, and industrial buildings; failure of non-structural components; disruption of transportation corridors such as Highway 29 and Silverado Trail; and damage to utilities including water, wastewater, power, and communications systems.

Secondary earthquake hazards also present a concern for Yountville. These include hazardous materials releases from industrial and commercial facilities, fires following earthquakes, prolonged power outages, and limited access for emergency response due to damaged roadways or bridges. Given the Town's strategic location in the Napa Valley, such disruptions could have regional economic and public safety consequences.

Liquefaction

Liquefaction represents a significant secondary earthquake hazard for the Town of Yountville due to local soil conditions, groundwater characteristics, and proximity to the Napa River. Liquefaction occurs when saturated, loose, fine-grained soils temporarily lose strength during intense ground shaking, causing the ground to behave more like a liquid. This phenomenon can result in ground settlement, lateral spreading,

loss of bearing capacity, and damage to buildings, roadways, and buried utilities. While liquefaction is a consideration in hazard mitigation planning, it is not profiled as a standalone hazard but addressed as a secondary earthquake effect.

Areas of Yountville with higher liquefaction susceptibility are generally located in low-lying portions of the Town underlain by young alluvial sediments. These conditions are most prevalent near the Napa River, where shallow groundwater levels increase the likelihood of liquefaction during moderate to strong earthquake shaking (Figure 5-14). In these areas, even structures designed to withstand seismic forces may experience damage if foundations or supporting soils lose stability.

Liquefaction can significantly amplify earthquake impacts by damaging lifeline infrastructure such as water, wastewater, storm drainage, gas, and telecommunications systems. Buried pipelines may rupture or become misaligned, roadways and bridges may settle or deform, and access routes needed for emergency response may be compromised. Industrial and commercial areas located on susceptible soils may face additional risks related to hazardous materials releases if tanks, pipelines, or containment systems are affected.

The earthquake scenario analyses for Yountville indicate that strong to very strong ground shaking (MMI VII–VIII) is likely under credible seismic events. When combined with local liquefaction-prone soils, these shaking intensities increase the potential for widespread ground failure in susceptible areas. As a result, liquefaction poses a threat not only to individual structures but also to the Town's broader functionality and recovery following a major earthquake.

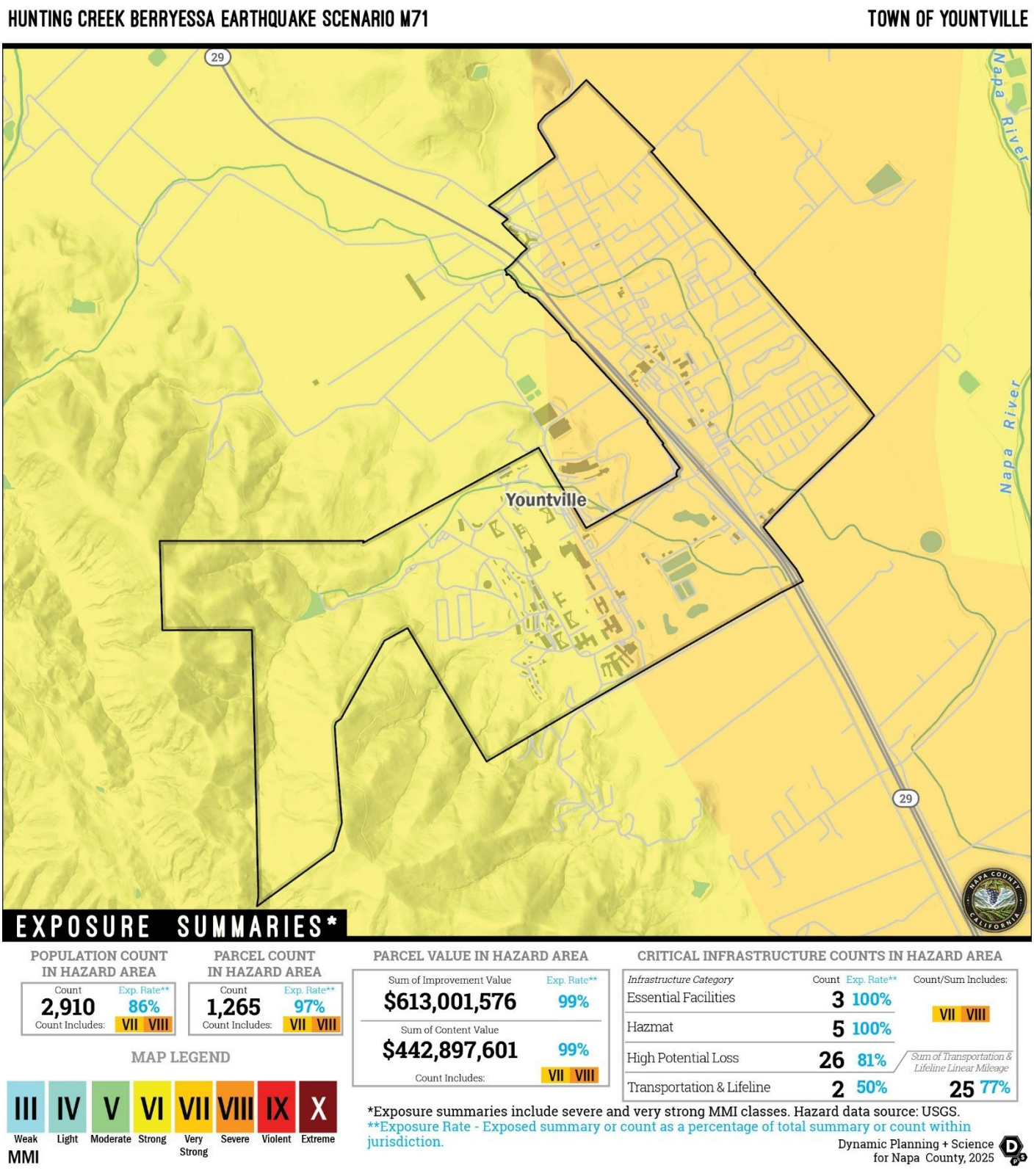


Figure 5-12: Exposure Summary – Yountville Earthquake Risk (M7.1 Hunting Creek–Berryessa)

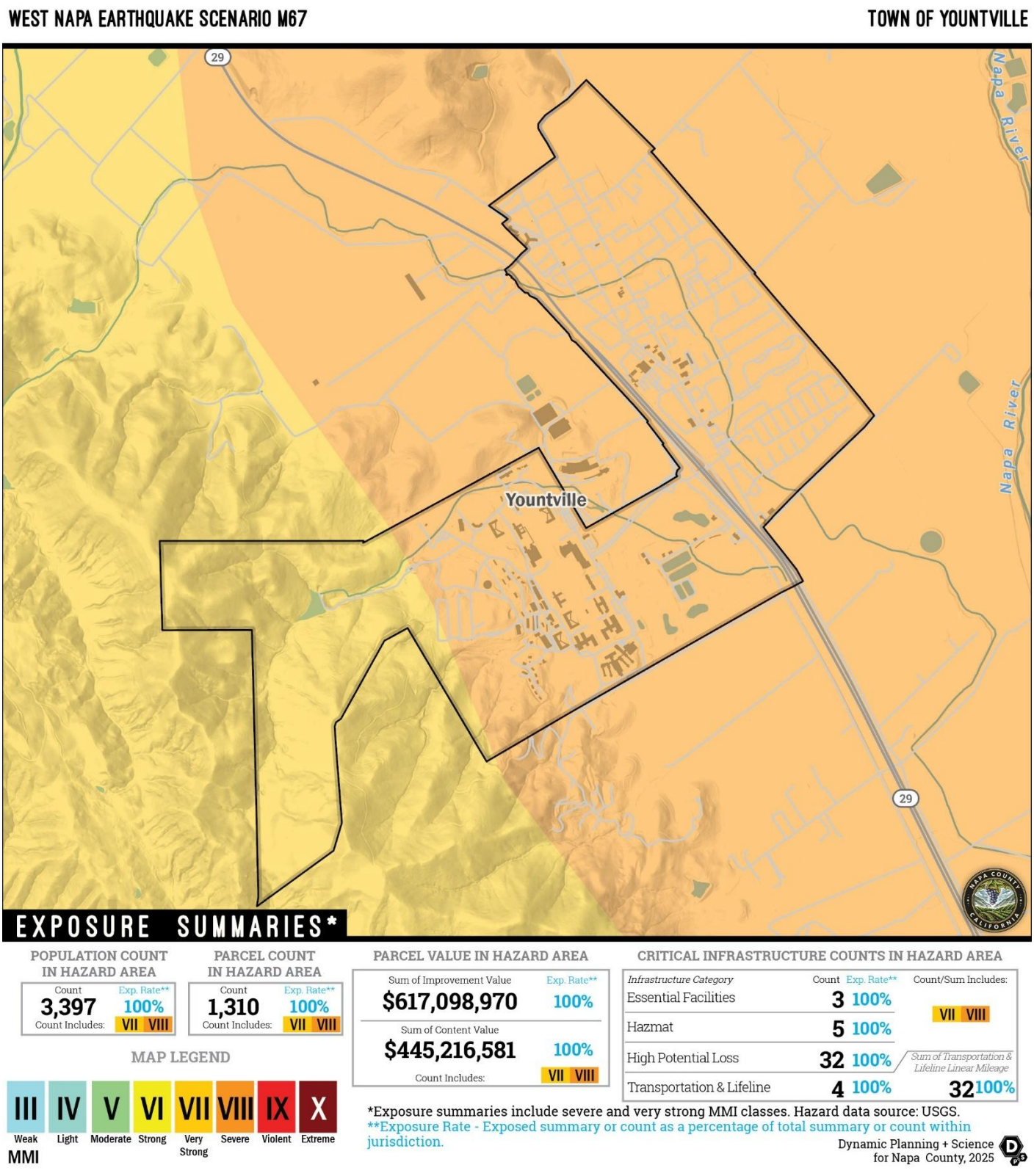


Figure 5-13: Exposure Summary – Yountville Earthquake Risk (M6.7 West Napa)

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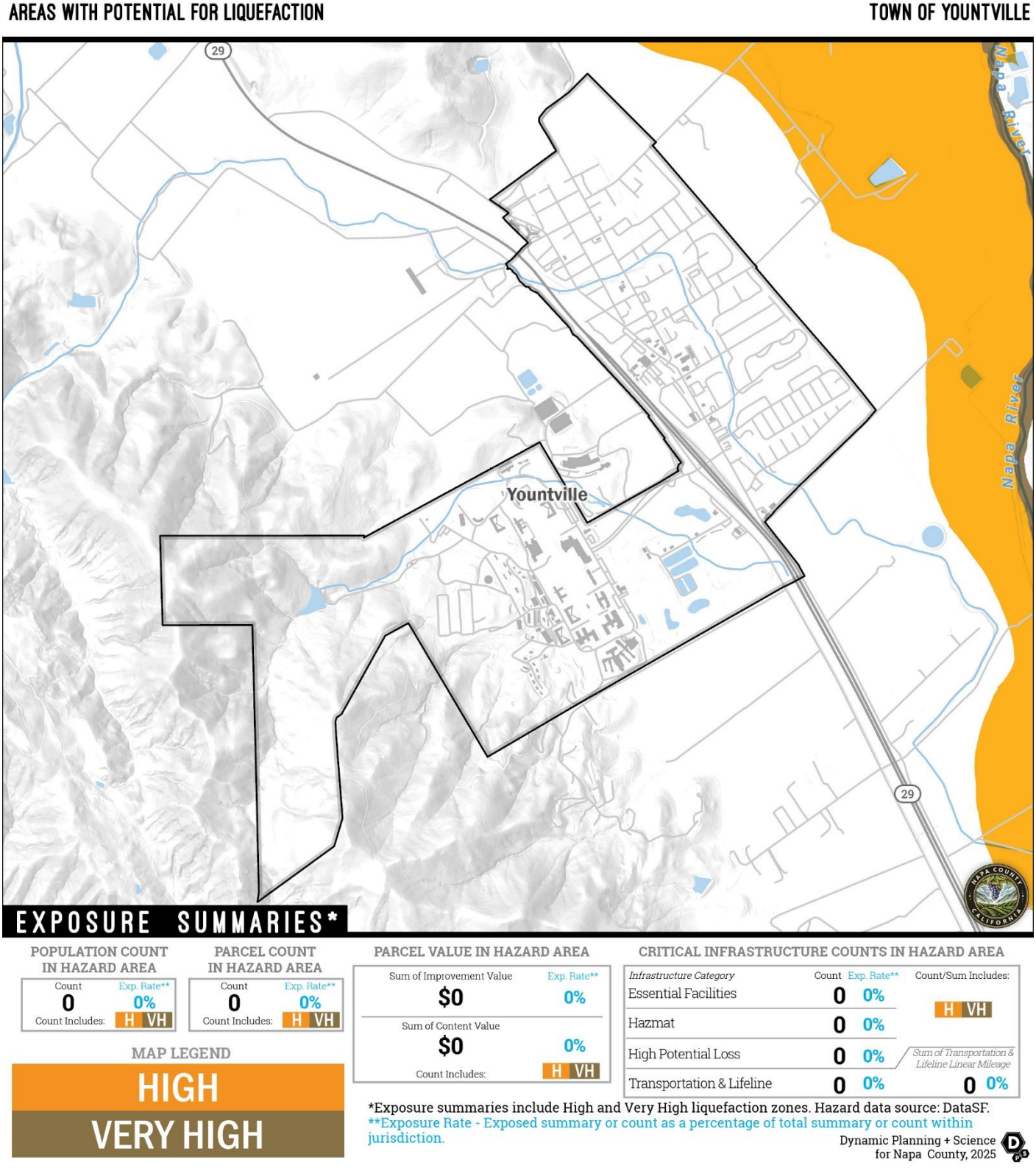


Figure 5-14: Exposure Summary – Yountville Liquefaction Risk

5.5.2.3 Flood Hazard

Flooding is a natural hazard for the Town of Yountville due to its location near the Napa River. Portions of the Town are subject to riverine flooding, particularly during major precipitation events, high tides, or conditions influenced by sea level rise. Flood hazard areas within Yountville are primarily concentrated along the Napa River, as well as along localized drainage corridors.

The FEMA Flood Risk Exposure map, Figure 5-15, shows areas within the 100-year (1-percent annual chance) and 500-year (0.2-percent annual chance) floodplains, including mapped floodway areas and zones protected by levees. These flood-prone areas reflect the combined influence of river overflow, tidal backwater effects, and constrained drainage capacity. Flood hazards in these areas may be exacerbated during extreme storm events when high river flows coincide with elevated bay water levels.

Exposure analysis indicates that approximately 1,620 residents, representing around 7% of the town's population, are located within mapped flood hazard areas. In addition, over 200 parcels (about 3% of all parcels) are exposed to flooding, with an estimated $128 million in building improvement value and a similar amount in contents value at risk. While no essential facilities or hazardous materials sites are located within the mapped flood hazard areas, several transportation and lifeline facilities intersect flood-prone zones, highlighting the potential for access disruptions and service interruptions during flood events.

Flooding in Yountville can result in structural damage to buildings, roadway inundation, utility system impacts, and long-term economic disruption. Repetitive or prolonged flooding may also affect industrial and commercial areas near the river, compounding recovery challenges. Secondary impacts include erosion, sediment deposition, and degradation of wetlands and shoreline infrastructure.

Climate change is expected to increase flood risk in Yountville over time. Projections for sea level rise, more intense precipitation events, and higher storm surge heights may expand flood extents, increase flood depths, and reduce the effectiveness of existing levees and drainage systems. Areas currently mapped within the 500-year floodplain may experience more frequent flooding in the future, increasing exposure to residents, infrastructure, and economic assets.

National Flood Insurance Program

The National Flood Insurance Program (NFIP) makes federally backed flood insurance available to homeowners, renters, and business owners in participating communities. FEMA has prepared a detailed Flood Insurance Study (FIS) for Napa County and municipalities. The study presents water surface elevations for floods of various magnitudes, including the 1% annual chance flood (100-YR flood) and the 0.2% annual chance flood (500-YR flood). Base flood elevations and the boundaries of the 100- and 500-YR floodplains are shown on Flood Insurance Rate Maps (FIRMs), which are the principal tools for identifying the extent and location of the flood hazard. FIRMs are the most detailed and consistent data source available, and for many communities they represent the minimum area of oversight under their floodplain management program. See Section 4 of Volume 1 for general information on the NFIP.

The Town of Yountville has participated in the NFIP since 1980 and has adopted the most recent FIRMs and FIS issued by FEMA (dated September 26, 2008) as well as local floodplain development regulations in compliance with the minimum NFIP standards (Yountville Municipal Code Chapter 15, Division 2). These minimum standards include procedures and provisions for substantial improvements and substantial damages to existing structures, the latter of which are employed by the floodplain administrator and town building inspectors following any hazard event affecting structures located in the flood hazard area in accordance with NFIP requirements. Regulations for substantial improvements are enforced via permitting procedures. Implementation and enforcement of the town's floodplain regulations are assigned to the floodplain administrator.

The Town of Yountville is currently in good standing with the provisions of the NFIP. Compliance is monitored by FEMA regional staff and by the California Department of Water Resources under a contract with FEMA. Maintaining compliance under the NFIP is an important component of flood risk reduction. See Table 5-12 for more information on the town's policies and historic flood insurance claims.

Table 5-12: Town of Yountville National Flood Insurance Program Information

Town of Yountville NFIP Status and Flood Insurance Statistics	
NFIP Status	Participating Since 3/18/1980
Community Identification (CID)	060209
CRS Class (Entry Date)	N/A
Policies in Force (Total Coverage)	30 Policies ($9,478,000 Coverage)
Policies Inside SFHA / Outside SFHA	15 Inside / 15 Outside
Policies in Coastal Zones (Total Coverage)	N/A
Total Claims (Total Paid)	22 Claims ($122,488 Paid)
Repetitive Loss (RL) / Severe Repetitive Loss (SRL) Properties	4 RL / 0 SRL
Repetitive Loss Payments	$83,793

Note: The number of policies is by property and does not count policies for individual buildings. The Privacy Act of 1974 (5 USC 522a) restricts the release of certain types of data to the public. Flood insurance policy and claims data is included in the list of restricted information. FEMA can only release such data to state and local governments, and only if the data is used for floodplain management, mitigation, or research purposes. Therefore, this plan does not identify the repetitive loss properties or include claims data for any individual property.

Principal Flooding Sources

The principal flooding source for the Town of Yountville is the Napa River and its tributaries. Riverine flooding from the Napa River and its tributaries is the primary driver of mapped flood risk in Yountville. During major storm events, high river flows can overtop banks or exceed channel capacity.

Localized flooding from creeks, drainage channels, and stormwater systems occurs within the town but generally represents a secondary source compared to the combined riverine and tidal flooding associated with the Napa River system.

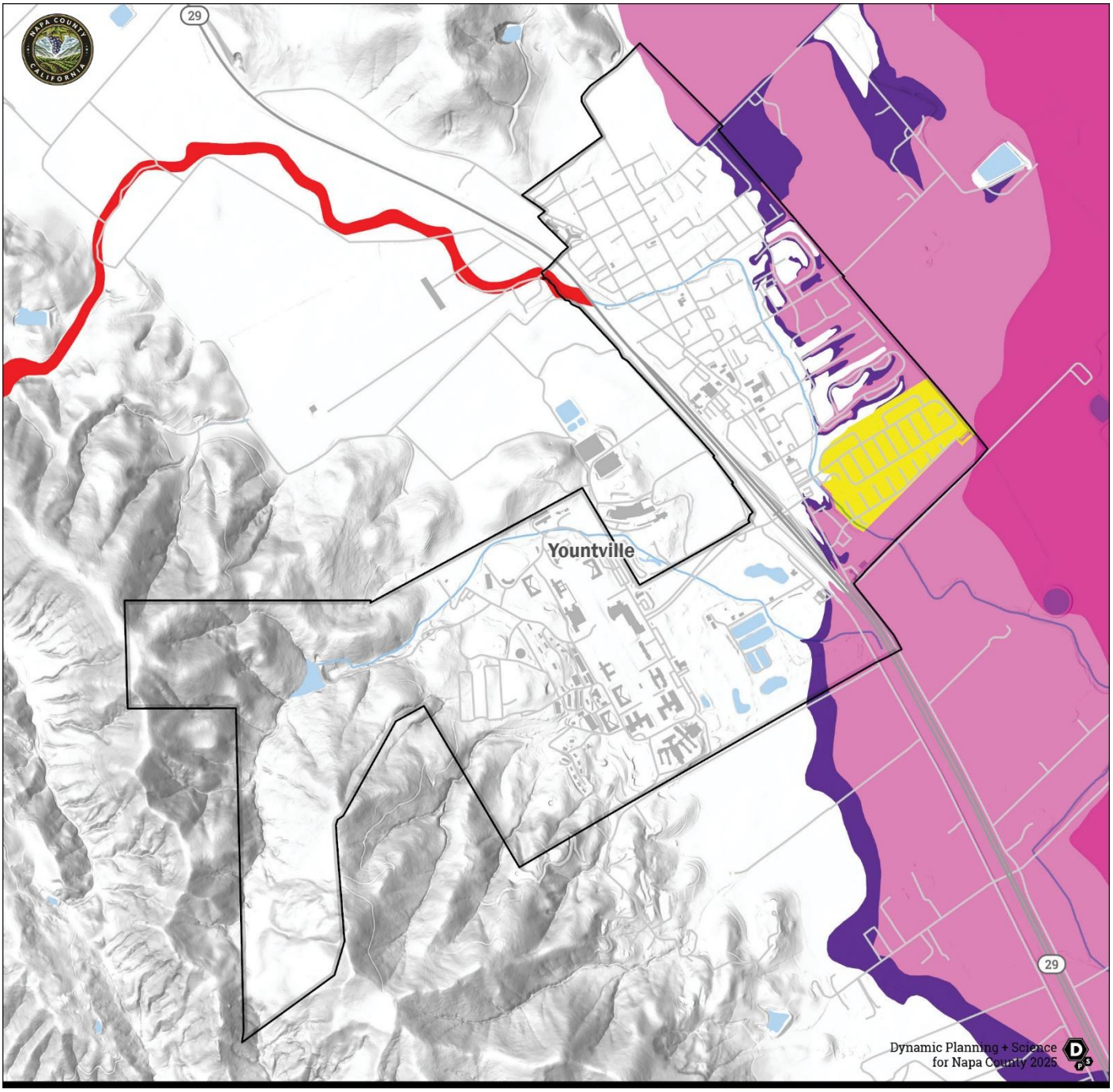


Figure 5-15: Exposure Summary –Yountville Flood Risk (FEMA Zones)

5.5.2.4 Extreme Heat Hazard

The town's inland valley location and reliance on outdoor agricultural labor make it particularly sensitive to rising temperatures and more frequent extreme heat days. While the bay influence of San Pablo Bay provides some natural moderation, climate change is projected to increase both the frequency and intensity of heat waves in the region, posing growing risks to public health, agriculture, and infrastructure.

Heat waves are becoming more common across California, with projections showing a significant rise in the number of extreme heat days by mid-century. In Yountville, outdoor agricultural workers face elevated risks during extreme heat events, particularly those without access to shaded rest areas, cooling stations, or protective equipment. Seniors, low-income residents, and individuals in older housing stock without air conditioning are also especially vulnerable to heat-related illness and may lack transportation to reach cooling centers.

The town's population exposure is compounded by socioeconomic factors. Some households in Yountville are cost-burdened and lack adaptive measures such as air conditioning or urban tree canopy coverage, increasing health risks during prolonged heat events. This mirrors statewide findings that low-income and minority populations are disproportionately affected by extreme heat.

The frequency of extreme heat days is projected to rise significantly across inland Napa County by mid-century. According to Cal-Adapt, Yountville will likely experience a climate change-driven increase in extreme heat days above 101.2°F from three days per year to 16 days per year by the end of the century under a medium emissions scenario (RCP 4.5). Over the same time period, the town is also likely to see an increase in warm nights above 60.6°F from four per year to 36.

For Yountville, this means disproportionate impacts on agricultural workers in the Napa Valley as well as low-income households with limited adaptive capacity. By the end of the century, the number of warm nights—when temperatures remain elevated and prevent recovery from daytime heat—is also projected to increase dramatically.

Extreme heat often coincides with elevated wildfire risk, reduced air quality from ozone and particulates, and public safety power shutoffs designed to prevent utility-caused ignitions. These secondary hazards can compound vulnerabilities by cutting access to cooling or disrupting medical care reliant on electricity.

5.5.2.5 Drought Hazard

The National Drought Monitor provides drought data and maps nationally and on a localized, watershed scale. The National Drought Monitor is the product of 11 agencies, including the NDMC, NOAA and USDA, and is available at http://droughtmonitor.unl.edu/. The National Drought Monitor categorizes the level of drought from D0 through D4, with D4 being the highest "exceptional drought." Table 5-13 depicts drought classifications and impacts from the level of drought occurrence in California, while Figure 5-16 shows a time series of the level of drought in Napa County from 2000 to 2025 according to the National Drought Monitor.

Drought is a recurring and long-term hazard for the Town of Yountville due to California's Mediterranean climate, variable precipitation patterns, and increasing impacts from climate change. Periods of prolonged below-average rainfall, reduced snowpack in the Sierra Nevada, and higher temperatures can significantly affect regional water supplies, ecosystems, and community resilience. Although drought does not typically cause immediate physical damage like other hazards, its cumulative impacts can be widespread and long-lasting.

Yountville relies on a combination of surface water and imported water supplies that are vulnerable to regional drought conditions. Extended drought periods can reduce available water supplies, increase demand during hotter and drier conditions, and place stress on water delivery systems. Drought conditions may also require implementation of mandatory water conservation measures, affecting residents, businesses, landscaping, and industrial operations.

Drought can exacerbate other natural hazards affecting Yountville. Dry conditions increase vegetation stress and fuel loads, elevating wildfire risk in surrounding grasslands and open space areas. Reduced soil moisture can also contribute to land subsidence, soil instability, and increased erosion during subsequent storm events. In addition, drought can degrade wetlands and riparian habitats along the Napa River and bayfront, reducing their natural flood attenuation and ecological functions.

Economic impacts of drought may include increased operational costs for businesses, reduced agricultural productivity in the surrounding region, and higher household expenses related to water use restrictions or rate adjustments. Vulnerable populations, including low-income households and elderly residents, may be disproportionately affected by higher utility costs and reduced access to cooling and water resources during extreme heat events associated with drought.

Climate change projections indicate that drought conditions in California are likely to become more frequent and severe, with longer dry periods punctuated by fewer but more intense storm events. These trends increase uncertainty in water supply reliability and place additional importance on long-term water resource planning, conservation, and resilience measures.

Table 5-13: Drought Classifications and Impacts

Category	Description	Possible Impacts
D0	**Abnormally Dry**	▪ Soil is dry; irrigation delivery begins early ▪ Dryland crop germination is stunted ▪ Active fire season begins
D1	**Moderate Drought**	▪ Dryland pasture growth is stunted; producers give supplemental feed to cattle ▪ Landscaping and gardens need irrigation earlier; wildlife patterns begin to change ▪ Stock ponds and creeks are lower than usual
D2	**Severe Drought**	▪ Producers increase water efficiency methods and drought-resistant crops ▪ Grazing land inadequate ▪ Fire season is longer, with high burn intensity, dry fuels, and large fire spatial extent, more fire crews on staff

Category	Description	Possible Impacts
		▪ Lake- and river-based tourism declines; boat ramps close ▪ Trees are stressed; plants increase reproductive mechanisms; wildlife diseases increase ▪ Water temperatures increase; programs to divert water to protect fish begin ▪ River flows decrease; reservoir levels are low and banks are exposed
D3	Extreme Drought	▪ Federal water is not adequate to meet irrigation contracts; extracting supplemental groundwater is expensive ▪ Fire season lasts year-round; fires occur in typically wet parts of the state; burn bans are implemented ▪ Ski and rafting business are low; mountain communities suffer ▪ Low water levels impede fish migration and cause lower survival rates ▪ Wildlife encroaches on developed areas; little native food and water is available for bears, which hibernate less ▪ Water sanitation is a concern; reservoir levels drop significantly; surface water is nearly dry; flows are very low; water theft occurs ▪ Livestock need supplemental feed, cattle and horses are sold; little pasture remains ▪ Well and aquifer levels decrease; homeowners drill new wells
D4	Exceptional Drought	▪ Fire season is very costly; number of fires and areas burned are extensive ▪ Many recreational activities are affected ▪ Fields are left fallow; orchards are removed; vegetable yields are low; honey harvest is small; agricultural unemployment is high, food aid is needed ▪ Fish rescue and relocation begin; pine beetle infestation occurs; forest mortality is high; wetlands dry up; wildlife death is widespread; algae blooms appear ▪ Poor air quality affects health: greenhouse gas emissions increase as hydropower production decreases; West Nile outbreaks rise ▪ Water shortages are widespread; surface water is depleted; federal irrigation water deliveries are curtailed; water prices are extremely high; wells are dry, more and deeper wells are drilled; water quality is poor

Source: Adapted from U.S. Drought Monitor Drought Classifications and Impacts

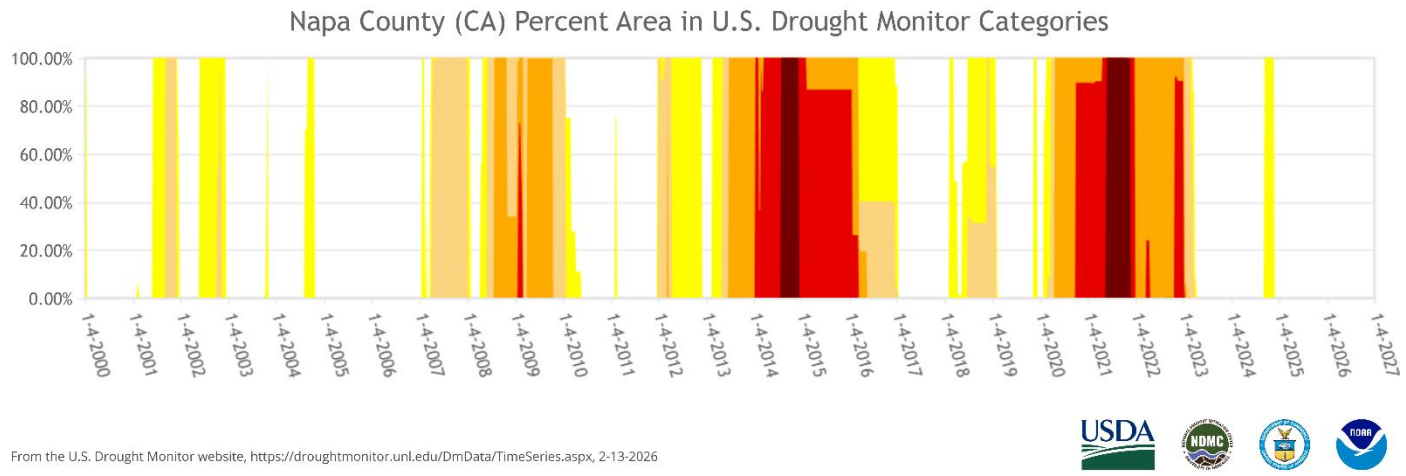


Figure 5-16: Drought Severity Timeline 2000-2024

5.5.2.6 Dam Failure Hazard

Dam failure is a lower-probability but high-consequence hazard for the Town of Yountville due to its downstream location from several reservoirs. Dam failure refers to the partial or complete structural failure of an upstream dam, resulting in the uncontrolled release of stored water. Although there are no major dams located within Yountville town limits, failure of an upstream dam could generate rapid downstream flooding affecting portions of the Town.

Potential causes of dam failure include extreme precipitation events that exceed design capacity, seismic activity, internal erosion or piping, slope instability, aging infrastructure, or operational issues. Earthquakes are a particular concern in Napa County, where strong ground shaking could compromise dam embankments, spillways, or outlet works. Climate change may also increase stress on dam systems by intensifying storm events and altering hydrologic conditions.

Dam failure events differ from typical riverine flooding in that floodwaters may arrive with little warning, high velocity, and significant destructive force, greatly increasing risks to life safety, structures, transportation corridors, and utilities. Because warning times may be limited, emergency preparedness, public awareness, and evacuation planning are critical components of risk reduction.

Dam safety oversight, inspection, and emergency action planning are managed at the state and regional levels, including by the California Department of Water Resources and the California Division of Safety of Dams. These agencies work with dam owners and local jurisdictions to monitor dam conditions and coordinate emergency notification procedures.

Dam inundation describes the geographic areas that could be flooded as a result of a dam failure upstream. Inundation mapping identifies where floodwaters would travel and accumulate if a failure were to occur.

The Dam Inundation Exposure map, Figure 5-17, shows that inundation zones in Yountville are primarily concentrated along the western portion of the Town near the Napa River corridor and other low-lying terrain. These areas reflect natural flow paths where floodwaters would be conveyed downstream under a dam failure scenario.

Exposure analysis indicates that approximately 600 residents and close to 100 parcels fall within these areas, with an estimated $94 million in building improvement value and $83 million in contents value exposed. Several high-potential-loss facilities and transportation and lifeline facilities are also located within inundation zones, underscoring the potential for service disruptions and access limitations during a dam-related flood event.

Dam inundation flooding can result in deep, fast-moving water capable of causing severe structural damage, roadway washouts, utility failures, and long-term economic disruption. Because these areas may experience flooding rapidly following a dam failure, evacuation and emergency response may be challenging, particularly in locations with limited access routes.

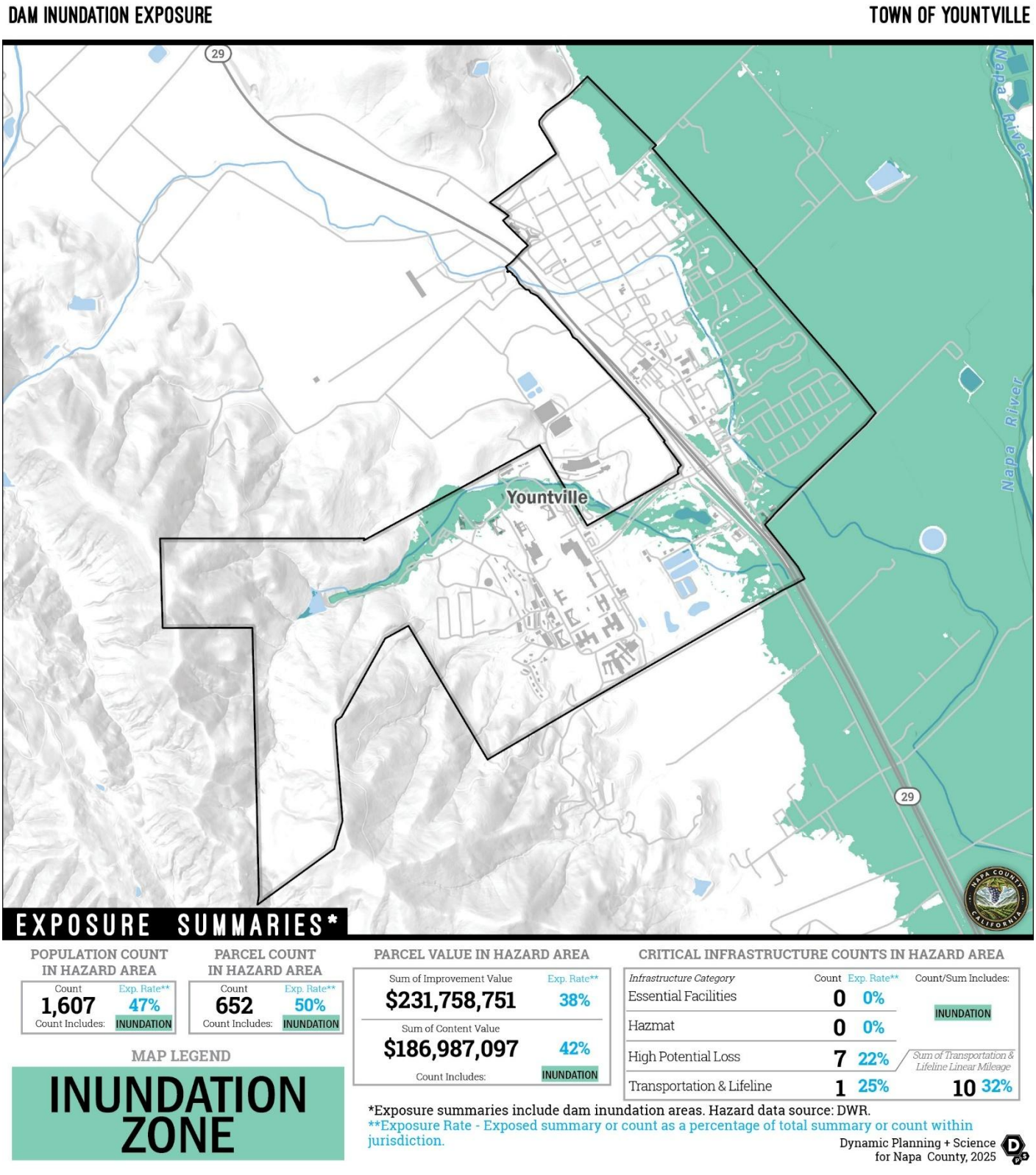


Figure 5-17: Exposure Summary – Yountville Dam Inundation Zone

5.5.2.7 Severe Weather Hazard

Severe storms are a recurring hazard in Yountville, typically driven by high winds, heavy rainfall, and atmospheric river events during the winter months. While tornadoes, hail, and snow are rare in the region, severe storm impacts can be significant due to the town's vulnerable infrastructure, older housing stock, and concentrations of at-risk populations.

Residents in mobile homes and older housing, many of whom are low-income or elderly, are particularly vulnerable during storm events. These households face heightened risks from power outages, mobility limitations, and health impacts during prolonged high-wind or heavy-rain events.

High winds frequently cause downed trees and power lines in and around Yountville, leading to widespread power outages, communication disruptions, and blocked roadways. Such conditions strain emergency response capabilities, delay evacuations, and exacerbate challenges for dependent populations.

Heavy rainfall during atmospheric river events can overwhelm Yountville's aging stormwater infrastructure, especially in older downtown areas and low-lying neighborhoods near culverts and sloughs. These localized flash floods result in hazardous road conditions, temporary isolation of neighborhoods, and damage to property and infrastructure.

Severe storm frequency and intensity are projected to increase because of climate change. Yountville already faces winter storms and recurring atmospheric rivers, which are contributing to repeated road closures, localized flooding, and long-term infrastructure strain. Climate-driven changes to storm severity highlight the Town's continued vulnerability to cascading hazards, including flooding and slope instability along the slough system.

While severe storms in Yountville may not produce catastrophic destruction, their compounding effects on vulnerable populations, lifeline infrastructure, and mobility make them a critical hazard for ongoing mitigation planning. Strategies to reduce risk should prioritize hardening power and drainage systems, enhance stormwater infrastructure, and develop targeted preparedness and response measures that reach the town's most at-risk residents.

5.5.2.8 Climate Change Hazard

Average annual temperatures across most of California have already increased by more than 1°F, with some areas experiencing rises of over 2°F when comparing the 1901 to 1960 average to that of 1986 to 2016. Daily maximum temperatures—a key indicator of extreme heat—are projected to increase by 4.4°F to 5.8°F by 2050 and by 5.6°F to 8.8°F by 2100. Heat waves that impact public health, known as heat-health events, are also expected to intensify across the state. By 2050, these events are projected to last up to two weeks longer in the Central Valley and occur four to ten times more often in the Northern Sierra region (California Natural Resources Agency, 2022).

California is already experiencing significant impacts from climate change, including prolonged drought, a lengthened wildfire season, increased coastal flooding and erosion, and widespread tree mortality. The state

has observed rising average temperatures, more extreme heat days, fewer cold nights, a longer growing season, and shifts in the water cycle, with less winter precipitation falling as snow. In addition, summertime fog has declined by approximately 33%, and both snowmelt and rainwater runoff are occurring earlier in the year (Cal OES, 2018).

Long-term trends indicate a 12% to 20% decline in fog across California from 1900 through projections to 2070. Climate experts suggest that warming temperatures reduce the ability of air masses to cool enough to produce fog, which plays a critical role in supporting California's ecosystems (Grantham, Teodore; University of California, Berkeley, 2018).

The Town of Yountville is increasingly vulnerable to the long-term impacts of climate change, which function as hazard multipliers across the Napa Valley and broader North Bay region. Yountville's location within an inland valley, combined with its proximity to San Pablo Bay and surrounding upland areas, creates a complex climate setting that is sensitive to shifts in temperature, precipitation patterns, and seasonal variability. Projected changes in these conditions are expected to intensify existing hazards, including flooding, severe weather, drought, and wildfire.

Precipitation, Storms & Flooding

Although total annual precipitation may not significantly increase, climate projections indicate that rainfall is more likely to occur in fewer, more intense storm events. These high-intensity storms, often associated with atmospheric river systems, increase the risk of riverine flooding along the Napa River as well as localized flooding in urban areas with constrained drainage systems.

Intense rainfall following extended dry periods can also increase the risk of erosion, localized slope instability, and debris flows, particularly in hillside areas surrounding the valley floor and along transportation corridors. These conditions can impact critical infrastructure, damage roadways, and disrupt emergency access. In addition, sea level rise combined with higher peak flows in the Napa River and its tributaries may exceed existing system capacity during extreme events, contributing to flooding beyond currently mapped floodplain boundaries.

Drought & Water Reliability

Climate change is expected to result in more frequent and prolonged drought conditions across Napa County. While the town benefits from a combination of local and regional water sources, extended dry periods can reduce water availability, increase demand, and place stress on both surface water and groundwater systems. Reduced precipitation and earlier snowmelt in upstream watersheds may affect reservoir storage and seasonal water supply reliability.

Drought conditions also have broader environmental and hazard implications. Reduced soil moisture and vegetation stress increase susceptibility to wildfire in surrounding areas, while also affecting urban landscaping and tree canopy health within the town. Prolonged dry conditions may also impact local creeks and riparian systems, which play an important role in stormwater conveyance, habitat, and groundwater recharge.

Wildfire & Vegetation Change

Climate-driven increases in temperature and changes in precipitation patterns are expected to extend the wildfire season and increase fire risk in areas surrounding the Town of Yountville. While much of the town is urbanized, it is bordered by wildland and open space areas that are susceptible to wildfire. Fires in surrounding areas can affect the town through evacuation impacts, degraded air quality, and strain on emergency services.

Changes in vegetation patterns, including increased tree mortality and shifts in species composition, may contribute to higher fuel loads over time. Even when wildfire does not directly impact the town, smoke and poor air quality can have significant public health consequences, particularly for sensitive populations.

Cascading Effects

Climate change amplifies interactions between hazards, creating compounding risks for Yountville. These cascading effects underscore the importance of integrating climate considerations into hazard mitigation planning, infrastructure investment, emergency preparedness, and community outreach. As climate conditions continue to evolve, proactive planning will be critical to reducing long-term risk and enhancing community resilience.

5.5.3 Climate Change Impacts & Vulnerable Populations

Climate change is expected to exacerbate many of the natural hazards affecting the Town of Yountville, increasing risks to populations that already face social, economic, or physical vulnerabilities. Rising temperatures, more extreme precipitation events, prolonged drought, sea level rise, and increased frequency of extreme heat are projected to intensify existing hazard conditions and create new challenges for public health, safety, and emergency response.

Certain populations in Yountville are more likely to experience disproportionate impacts from climate-related hazards. Older adults, individuals with disabilities, low-income households, renters, and households with limited English proficiency may have reduced capacity to prepare for, respond to, and recover from climate-driven events. These groups may face barriers related to mobility, access to transportation, financial resources, housing stability, or timely access to emergency information.

Extreme heat presents a growing risk to vulnerable populations, particularly elderly residents, individuals with underlying health conditions, outdoor workers, and households without adequate cooling. Heat waves can increase the incidence of heat-related illness, strain electrical systems, and worsen air quality, especially when combined with wildfire smoke. Low-income households may be less able to afford cooling costs or make energy-efficient upgrades, increasing exposure during prolonged heat events.

Flooding disproportionately affect residents and workers in low-lying areas near the Napa River. Vulnerable populations living or working in these areas may face greater risk of displacement, property damage, and disruption of access to essential services. Flood events can also impact transportation routes and utilities,

creating additional challenges for individuals who rely on public transit, medical equipment, or nearby services.

Drought and water scarcity can place added burdens on vulnerable populations by increasing utility costs, limiting access to cooling and landscaping, and reducing the resilience of natural systems that provide flood protection and cooling benefits. For low-income households and fixed-income seniors, increased water and energy costs associated with drought and heat can compound financial stress.

Climate change may also increase the frequency and duration of poor air quality events, particularly from regional wildfires. Individuals with respiratory conditions, older adults, children, and outdoor workers are especially sensitive to smoke exposure. Limited access to air filtration, clean indoor environments, or protective equipment can further increase health risks for vulnerable populations.

5.5.4 Hazard Problem Statements

As part of the mitigation action identification process, the Planning Committee for each jurisdiction identified areas of concern (aka problem statements) for their respective facilities based on the risk assessment and vulnerability analysis, utilizing the RAMP mapping and static snapshot maps. Problem statements focused on the impact, victim, or threat that the hazard could create in the jurisdiction, as described in Table 5-14. Identifying common issues and weaknesses through these problem statements assisted the planning group in understanding the realm of resources needed for mitigation.

The goal is to have at least one mitigation action for every problem statement. Projects or actions have been developed to mitigate each problem identified. See Table 5-16 for a full list of mitigation actions and corresponding problem statements that they address. Each problem statement is coded with a problem number for cross-referencing between Table 5-14 and Table 5-16

Table 5-14: Town of Yountville Hazard Problem Statements

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-CC-YT-12	Climate Change	Victim	**Town of Yountville**	Yountville's large and growing senior population is increasingly vulnerable to climate-driven hazards such as extreme heat, smoke from wildfire, and severe weather, elevating risks of illness and energy insecurity among medically and economically vulnerable residents.	ma-CC-NCo-16, ma-CC-YT-122, ma-AH-YT-224
ps-CC-YT-335	Climate Change	Threat	**Town of Yountville**	Climate change is projected to increase the frequency and severity of hazards such as extreme heat, drought, wildfire, severe weather, and flood.	ma-HH-YT-227
ps-DF-YT-29	Dam Failure	Victim	**Town of Yountville**	Approximately 1,600 residents, including those in two mobile home parks, are located in dam inundation zones associated with Veterans Home Dam (Lake Hinman) or Conn Creek Dam.	ma-FL-NCo-55, ma-FL-NCo-56, ma-FL-YT-72, ma-DF-NCo-120, ma-AH-YT-224, ma-DF-YT-226

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-DF-YT-30	Dam Failure	Threat	**Town of Yountville**	Multiple critical facilities and key access routes are located in dam inundation zones associated with Veterans Home Dam (Lake Hinman) and Conn Creek Dam.	ma-FL-NCo-55, ma-FL-NCo-56, ma-FL-YT-72, ma-DF-NCo-120, ma-DF-YT-226
ps-DR-YT-43	Drought	Impact	**Town of Yountville**	The increasing frequency and duration of multi-year droughts strain Yountville's water supply reliability, reducing available water for emergency and basic household needs.	ma-DR-YT-31
ps-DR-YT-336	Drought	Victim	**Town of Yountville**	The impacts of drought disproportionately affect seniors, low-income households, and residents in multifamily or rental housing with limited control over water use.	ma-DR-YT-31
ps-DR-YT-337	Drought	Threat	**Town of Yountville**	The frequency, severity, and duration of droughts are increasing due to climate change.	ma-DR-YT-31
ps-EQ-YT-72	Earthquake	Victim	**Town of Yountville**	More than 3,200 residents are exposed to very strong to severe shaking from a major earthquake, with renters, low-income residents, and those living in older or mobile homes facing disproportionate risk.	ma-AH-NCo-4, ma-EQ-YT-45
ps-EQ-YT-73	Earthquake	Threat	**Town of Yountville**	Over $1 billion in property and all critical facilities are located in strong to severe shaking zones, creating a high potential for long-duration outages, functional losses, and costly post-event repairs.	ma-EQ-YT-45
ps-EQ-YT-338	Earthquake	Threat	**Town of Yountville**	Local soil conditions, proximity to fault lines, aging utility systems, and buildings that lack adequate seismic retrofits increase the threat of structural collapse, utility disruption, and hazardous material releases during a major earthquake.	ma-EQ-YT-45
ps-EQ-YT-339	Earthquake	Impact	**Town of Yountville**	A major earthquake could damage or destroy critical facilities and disrupt community lifelines, including for water, power, and transportation.	ma-EQ-YT-45
ps-FL-YT-114	Flood	Victim	**Town of Yountville**	Flooding along Hopper Creek, Beard Ditch, and other drainageways places more than 1,300 residents and millions of dollars in property value at risk during heavy rainfall and atmospheric river events.	ma-FL-NCo-55, ma-FL-NCo-56, ma-FL-YT-75, ma-FL-YT-76
ps-FL-YT-116	Flood	Victim	**Town of Yountville**	Yountville has one repetitive loss property located on 2 Talent Lane with two losses and total paid claims of $23,457.66.	ma-FL-YT-73
ps-FL-YT-340	Flood	Threat	**Town of Yountville**	The frequency and severity of flooding is expected to increase due to climate change.	ma-FL-YT-73
ps-HH-YT-346	High Heat	Victim	**Town of Yountville**	Extreme heat events place seniors, medically vulnerable residents, outdoor workers, and low-income households at elevated risk of heat-related illness.	ma-AH-YT-224, ma-HH-YT-227
ps-HH-YT-347	High Heat	Threat	**Town of Yountville**	The number of extreme heat days and warm nights and duration of heat waves is anticipated to increase with climate change.	ma-AH-YT-224, ma-HH-YT-227

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-FL-YT-115	Severe Weather	Victim	**Town of Yountville**	Heavy rain events such as atmospheric rivers cause localized flooding along the natural creeks and drainages that traverse the area.	ma-FL-YT-74
ps-SW-YT-341	Severe Weather	Impact	**Town of Yountville**	Increasingly intense wind events topple trees, damage power lines, and obstruct roadways, causing power outages, blocked emergency routes, and service disruptions.	ma-FL-YT-72, ma-SW-YT-225
ps-SW-YT-342	Severe Weather	Impact	**Town of Yountville**	Winter storms can disrupt transportation and power services from high wind, heavy rain, and ice.	ma-FL-YT-72, ma-SW-YT-225
ps-SW-YT-343	Severe Weather	Victim	**Town of Yountville**	Seniors, medically dependent residents, and those without backup power or transportation are particularly vulnerable to prolonged outages and isolation from severe weather events.	ma-FL-YT-72, ma-SW-YT-225
ps-WF-YT-176	Wildfire	Victim	**Town of Yountville**	Vulnerable residents, including seniors and those with underlying medical conditions, may face evacuation challenges during fast-moving fires and are disproportionately at risk from smoke impacts.	ma-WF-NCo-90, ma-WF-YT-109
ps-WF-YT-344	Wildfire	Threat	**Town of Yountville**	Neighborhoods along Yountville's western edge, including areas near the Veterans Home and adjacent WUI, lie in moderate to very high fire hazard severity zones with limited ingress and egress.	ma-AH-YT-224
ps-WF-YT-345	Wildfire	Impact	**Town of Yountville**	Regional wildfires and prescribed burns degrade air quality in Yountville, causing days to weeks of unhealthy conditions and disrupting outdoor businesses and tourism.	ma-WF-YT-109, ma-AH-YT-224

5.6 Mitigation Strategy

This section provides the framework for how the Town of Yountville will reduce hazard risk within its jurisdiction while supporting the broader goals of the Napa County MJHMP. It includes an overview of existing capabilities, opportunities to strengthen resilience, and the town's prioritized mitigation actions. Together, these elements demonstrate how Yountville integrates hazard awareness into its planning and development processes while contributing to a coordinated countywide approach.

Within the Napa County MJHMP, the mitigation strategy serves as the roadmap for future hazard mitigation efforts. For Yountville, the strategy outlined in this annex reflects the outcomes of the countywide planning process while also addressing the town's unique risks, priorities, and community needs. The strategy is designed to reduce vulnerabilities identified in the risk assessment, including the problem statements developed for flooding, earthquakes and liquefaction, slope failure, wildfire, drought, severe storms, extreme heat, and climate change.

Mitigation actions identified in this annex include both policy-based and project-based initiatives, with an emphasis on integrating resilience into land use planning, infrastructure investments, and community programs. Actions are structured to align with FEMA's requirements and to coordinate with existing town, county, and regional planning mechanisms. Each action identifies responsible parties, potential funding sources, and the resources needed for implementation.

For Yountville, this strategy provides a framework for strengthening resilience by combining Town-led initiatives, such as infrastructure improvements, building code enforcement, and community preparedness, with regional coordination through the MJHMP. By advancing these efforts in alignment with the General Plan and other local planning documents, Yountville enhances its ability to reduce hazard risk while supporting long-term community safety, sustainability, and economic stability.

The subsections that follow describe these elements in detail:

- **Sections 5.6.1, Capabilities and Opportunities,** provides a summary of the city's capacity to address natural hazards.
- **Section 5.6.2, Mitigation Action Plan,** presents Yountville's prioritized actions to guide implementation in coordination with countywide strategies.
- **Section 5.6.3, Status of Previous Mitigation Actions,** provides a summary of all previous actions and their current status, whether completed, cancelled, or revised.

Aligning the Action Plan

This section connects Yountville's mitigation actions with its existing capabilities and areas for growth. Capability assessments are a required element of hazard mitigation planning under the Disaster Mitigation Act of 2000 and FEMA's 2023 guidance, ensuring that actions are realistic, achievable, and aligned with available resources.

The section begins with a summary of Yountville's capabilities across four areas: planning and regulatory, administrative and technical, fiscal, and education and outreach. This overview highlights the tools and strengths that the district already uses to reduce hazard risk. The section then provides a detailed analysis of each capability area, identifying both current practices and opportunities to expand resilience.

5.6.1 Capabilities & Opportunities

This section provides a detailed assessment of the city's current capabilities to support hazard mitigation, as well as future opportunities. This consists of describing how the city is planning for hazards and growth and a summary of its existing capabilities and the potential for enhancement.

5.6.1.1 Planning for Hazards & Growth

As a general law municipality, the Town of Yountville manages growth within the framework of California's comprehensive planning, zoning, subdivision, and environmental regulations. Much of the Town's developable land has already been urbanized, and remaining growth is largely directed toward infill development, redevelopment, and planned buildout within the existing urban footprint. Yountville is bordered by the Napa River to the east and hillside terrain to the west, which constrains outward expansion and concentrates future development in areas already subject to natural hazards.

This development pattern places portions of the Town's population, infrastructure, and economic assets within areas exposed to hazards such as riverine flooding along the Napa River, dam inundation zones, strong earthquake ground shaking and liquefaction, and extreme heat and drought conditions. Industrial and commercial areas near the river corridor and residential neighborhoods in low-lying areas are particularly sensitive to flooding, while hillside areas west of the town face localized risks related to slope instability and wildfire exposure.

Hazard vulnerability is addressed through coordination with the Town's General Plan, particularly the Safety Element, which integrates hazard information into land use decisions, infrastructure planning, and development review. This approach ensures that growth and redevelopment consider site-specific risks and incorporate appropriate mitigation measures, such as flood-resilient design, geotechnical stabilization, and emergency access planning. Integration of hazard considerations into long-range planning also supports compliance with state and federal hazard mitigation requirements and strengthens the Town's eligibility for disaster recovery and resilience funding.

Climate change is expected to intensify several of the hazards affecting Yountville, including flooding influenced by sea level rise, more extreme precipitation events, prolonged drought, and increasing extreme heat. As growth continues within constrained and hazard-exposed areas, resilience must be embedded into every phase of planning and development. Growth management in Yountville therefore emphasizes sustainable building practices, water conservation, protection of natural floodplain functions, and climate-adaptive infrastructure, ensuring that future development and redevelopment reduce, rather than exacerbate, existing hazard risks and support long-term community resilience.

Long-Range Planning & Growth Management

Long-range planning and growth management policies play a central role in limiting hazard exposure in Yountville. The Town's General Plan establishes the overall land use pattern, directs growth toward areas that can be safely and efficiently served by infrastructure, and discourages development in areas subject to significant natural hazards where feasible.

Growth in Yountville has largely occurred within an established urban footprint, with an emphasis on infill development, redevelopment, and planned expansion areas that are supported by existing transportation, utility, and emergency services. This approach helps reduce the need for development in hazard-prone areas such as floodplains, steep slopes, and wildfire-prone wildland–urban interface locations. Where development does occur near hazard areas, planning policies emphasize hazard-aware site design, infrastructure resilience, and emergency access.

Long-range planning efforts also account for future climate conditions, recognizing that extreme heat, drought, and more intense storm events may alter hazard profiles over time. Incorporating these considerations into growth management helps ensure that future development does not increase vulnerability or place undue strain on emergency response and public services.

Building Codes & Development Standards

Yountville's development strategies combine comprehensive planning frameworks with robust regulatory measures to guide growth while reducing risks from natural hazards. Building codes play a central role in this approach. Nationally, continual improvements to building codes since 1990 have added only about one percent to construction costs while greatly improving disaster resilience (National Institute of Building Sciences, 2019). In California, building codes are among the most stringent in the world, setting minimum standards that safeguard against hazards such as earthquakes, flooding, wildfire, landslides, and severe weather. Yountville enforces these standards locally, providing a strong foundation for resilient construction.

The Town is required to regularly update its development regulations to reflect the California Building Code (CBC), which is revised every three years and was most recently updated in 2025. The CBC establishes some of the world's highest construction standards, ensuring occupant safety in the face of natural hazards. Climate change is also addressed through adoption and updating of the California Green Building Standards (CALGreen) and Energy Codes, which integrate energy efficiency, sustainable design, and climate adaptation measures. In addition, Yountville participates in the National Flood Insurance Program (NFIP), requiring that all new development in designated flood hazard areas meet FEMA's minimum flood protection standards.

Through these building and development regulations, Yountville ensures that new development in hazard-prone areas is either restricted or subject to strict hazard-mitigation requirements. Where development is allowed, codes emphasize reducing exposure and vulnerability through appropriate siting, advanced construction techniques, emergency access, and defensible space. For example, new construction in the

wildland–urban interface (WUI) must comply with fire-resistant building materials and vegetation management requirements under the California Fire Code.

Beyond code enforcement, Yountville integrates these mandates into broader local planning frameworks, including the General Plan and HMP This alignment ensures that growth management, environmental review, and hazard mitigation strategies collectively address emerging risks from wildfire, drought, flooding, extreme heat, and severe weather intensified by climate change.

California Environmental Quality Act (CEQA) & Hazard Mitigation

The California Environmental Quality Act (CEQA) requires General Plans, Specific Plans, and major development projects to evaluate hazards such as flooding, seismic risk, and wildfire. Environmental documents must identify these risks and propose mitigation measures, which may include setbacks from hazard-prone areas, infrastructure upgrades, evacuation planning, or restrictions on development in high-risk zones.

Regional and state public safety planning frameworks that inform development review in Yountville include the State Seismic Hazards Mapping Act, the California Environmental Quality Act (CEQA) and its Guidelines, California Noise Insulation Standards (Title 24), and the Federal Emergency Management Agency (FEMA) Flood Insurance Program. Together, these programs establish requirements for evaluating and mitigating environmental and hazard-related impacts associated with development.

Under CEQA, residential projects that require discretionary approval from the town are subject to environmental review concurrently with the approval process. While CEQA review can add time to development and is therefore considered a potential constraint to housing production, much of Yountville's remaining vacant and developable land has already undergone environmental review through Program Environmental Impact Reports (PEIRs) prepared as part of adopted specific plans. These PEIRs streamline subsequent project-level CEQA review by identifying environmental impacts and mitigation measures in advance, allowing later residential projects to tier from or rely on existing CEQA documents. Projects that deviate from the assumptions or scope of adopted specific plans may also tier from previously certified CEQA analyses, where appropriate.

Recent updates to CEQA standards have also changed how transportation and air quality impacts are evaluated. Transportation impacts are no longer assessed using Level of Service (LOS), which measured vehicle delay, but instead rely on Vehicle Miles Traveled (VMT) as the primary metric. This shift emphasizes reducing vehicle travel and associated emissions rather than roadway congestion.

In addition, updated Bay Area Air Quality Management District (BAAQMD) greenhouse gas (GHG) thresholds, adopted in April 2022, require changes to how GHG impacts are analyzed in CEQA documents. Under these standards, plans or projects within BAAQMD jurisdiction must either demonstrate consistency with an adopted, qualified local Climate Action Plan or incorporate specific project features, including all-electric buildings, a minimum reduction in VMT, and electric vehicle infrastructure meeting CalGreen Tier 2 requirements.

Although LOS is no longer used for CEQA compliance, the town continues to use LOS analysis as a non-CEQA planning tool to evaluate roadway operations, support infrastructure planning, and ensure that key transportation corridors function effectively and meet community expectations. Together, CEQA and related regulatory frameworks play a critical role in integrating hazard mitigation, climate adaptation, and sustainability considerations into development and long-range planning decisions in Yountville.

By integrating hazard analysis into the development review process, CEQA helps ensure that future growth in Yountville is designed with resilience and long-term community safety in mind.

5.6.1.2 Development & Hazard Considerations

Development in the Town of Yountville occurs within a physical and regulatory context shaped by natural hazards, environmental constraints, and long-term growth management policies. As a general law town operating under California planning and environmental regulations, Yountville evaluates development proposals with consideration for hazard exposure, public safety, infrastructure capacity, and long-term resilience. This integrated approach helps ensure that new development and redevelopment do not increase risk to people, property, or critical systems.

Much of the Town's remaining development potential lies within areas that are already urbanized or planned through adopted specific plans. As a result, development often occurs in proximity to known hazard areas, including floodplains along the Napa River, dam inundation zones, liquefaction-prone soils, and areas exposed to strong seismic shaking and extreme heat. Rather than avoiding development entirely in these locations, the Town emphasizes risk-informed site planning, design, and construction standards to reduce vulnerability and limit potential impacts.

Flood hazards are addressed through enforcement of flood plain management regulations, participation in the National Flood Insurance Program, and incorporation of flood-resilient design measures for development in or near mapped flood hazard areas. These measures may include elevating structures, protecting utilities, maintaining flood conveyance, and avoiding critical facilities in the highest-risk locations. Development decisions also consider future flood conditions associated with sea level rise and more intense storm events.

Seismic hazards are a key consideration in development review due to the Town's location within the seismically active San Francisco Bay Area. Projects are required to comply with state seismic design standards and, where appropriate, conduct site-specific geotechnical investigations to address ground shaking, liquefaction, and slope stability. These requirements help reduce structural damage and protect infrastructure during earthquake events.

Wildfire, slope failure, and extreme weather hazards are also considered during development review, particularly in areas near the eastern hills, open space, and transportation corridors. Development standards related to defensible space, access, drainage, and emergency response are used to minimize risk and support safe evacuation and emergency operations.

The CEQA provides a framework for identifying hazard-related impacts at the project level and requiring feasible mitigation measures. Through CEQA review, the Town evaluates whether proposed development would expose people or structures to significant risks from natural hazards and ensures that appropriate avoidance, design, or mitigation measures are incorporated into project approvals.

5.6.1.3 Capabilities & Opportunities Assessment

To develop a realistic and actionable mitigation strategy, it must account for existing jurisdictional capabilities and what future opportunities there are to enhance those capabilities for purposes of hazard mitigation. This section provides an assessment of the Town of Yountville's existing capabilities and future opportunities, including planning and regulatory, administrative and technical, fiscal, and public outreach and education capabilities. This assessment also identifies opportunities to integrate this MJHMP into future planning, policies, or programs to weave mitigation efforts into daily operations and address hazard problems wholistically. Capabilities are categorized into four groups and include various mechanisms.

- **Planning and Regulatory Capabilities:** Existing long-range plans, emergency response plans, hazard-specific plans, land use policies, and building and development standards.
- **Administrative and Technical Capabilities:** Available expertise in emergency services, engineering, grant management, and community planning.
- **Fiscal Capabilities:** Budgetary capacity, taxing authority, grants, and other funding mechanisms that can support mitigation projects.
- **Outreach and Education Capabilities:** Existing programs for providing technical assistance, community education, public warnings, and stakeholder engagement.

A full description of the process used to develop the capabilities assessment is provided in Volume 1, Section 2.3.3.

This capabilities and opportunities assessment for Yountville lists the various types of capabilities along with how they have been, currently are, or will in the future be integrated into hazard mitigation planning efforts. The three "HMP Integration" columns that identify the capability's status and usage are color-coded with green, yellow, or orange shading to communicate the following:

- **Status:** If the capability is present at all and what level of use it has generally.
- **Current Mitigation Use:** If the capability is currently being used in mitigation efforts, specifically, and at what level.
- **Future Opportunity:** If there is a future opportunity to integrate the capability into mitigation efforts and at what level.

Summary of Capabilities & Opportunities

This Capabilities and Opportunities Assessment for the Town of Yountville summarizes the various types of capabilities it has for hazard mitigation currently. The assessment also identifies opportunities to integrate, expand, and improve the city's capabilities for future hazard mitigation. Table 5-15 provides a

comprehensive list of capabilities and identifies the current status, current mitigation use, and future opportunities.

Planning & Regulatory

The Town of Yountville has strong planning and regulatory capabilities that support hazard risk reduction and resilient development. The Town enforces the California Building Code (Title 24) and locally adopted ordinances that address floodplain management, fire safety, stormwater control, water conservation, and development in inundation and hillside areas. These regulations are integrated into zoning, subdivision, and site plan review processes, ensuring that hazard considerations are addressed during development reviews.

Growth management is guided by policies in the Town's General Plan, with updated hazard, climate change, and environmental justice policies being incorporated through the General Plan update. Capital investments are prioritized through the Capital Improvements Program (CIP), which supports resilient infrastructure for water, storm drainage, transportation, and public services.

Yountville maintains several hazard reduction programs, including stormwater management and erosion control, water conservation, and public outreach through the Town's emergency preparedness webpage. The town also promotes non-structural earthquake preparedness and household-level mitigation actions.

The Town participates in the National Flood Insurance Program (NFIP) and enforces local floodplain management regulations supported by current FEMA flood mapping and elevation certificate records. While flood preparedness information is available, flood insurance education is limited, and the Town does not currently participate in FEMA's Community Rating System (CRS), representing a future opportunity for enhanced flood risk reduction.

Future integration of the MJHMP will occur through various processes and mechanisms outlined across multiple mitigation actions (Table 5-16). Key opportunities for future hazard mitigation integration with the Town of Yountville's existing planning mechanisms include incorporating the updated risk assessment, hazard-specific vulnerability findings, and projected climate change impacts into the Enhanced Emergency Shelter Network (ma-AH-YT-224), Severe Weather Notification System (ma-FL-YT-72), and Wildfire Mitigation Outreach & Education action (ma-WF-YT-109).

Administrative & Technical

The Town of Yountville has strong administrative and technical capacity to support hazard mitigation planning, implementation, and coordination. Core planning, engineering, and development review functions are housed within the Planning & Building Department. These staff provide expertise in land use planning, development review, infrastructure design, and enforcement of building and safety standards.

The Town has access to qualified personnel for key hazard mitigation functions, including community planning, land development review, construction engineering, natural hazards analysis, transportation planning, and resilience planning. The Building Division provides building code administration, and the

Town Manager serves as the Floodplain Administrator and Director of Emergency Services, ensuring direct coordination between planning, emergency management, and floodplain compliance. Fire prevention and wildfire mitigation functions are supported by the Napa County/CALFIRE Department through the Fire Marshal.

While the Town does not have dedicated staff for public outreach, GIS, or grant management, these functions are addressed through shared responsibilities across departments and through coordination with regional partners such as Napa County, which provides GIS support. This shared staffing approach effectively supports current mitigation activities but represents an opportunity for enhancement as hazard mitigation, climate adaptation, and grant funding efforts expand.

Warning Systems & Services

The Town of Yountville has strong warning and emergency communication capabilities to alert residents, businesses, and visitors of hazardous conditions and emergency situations. The Town utilizes the Alert Napa County emergency notification system as its primary platform for disseminating time-sensitive warnings related to natural hazards, evacuations, sheltering, and public safety incidents.

Emergency information is also communicated through Town and partner social media channels, which provide rapid updates and situational awareness during evolving incidents. These electronic communication methods are supplemented by non-electronic outreach, including door-to-door notifications when necessary, and emergency vehicle sirens used by police and fire agencies to warn the public in affected areas.

This multi-channel approach helps ensure redundancy and increases the likelihood that critical information reaches residents with varying access to technology or communication needs. Warning systems support response to a range of hazards, including flooding, wildfire, earthquakes, extreme weather, and power shutoff events.

Fiscal

The Town of Yountville has moderate to strong fiscal capacity to support hazard mitigation through a combination of local revenues, fees, grants, and long-term financing tools. These funding mechanisms support infrastructure maintenance, capital improvements, and implementation of hazard mitigation measures identified in town plans and programs.

The Town collects utility fees for water, recycled water, and sewer services, which help fund infrastructure upgrades that support drought resilience, flood protection, and system reliability. System development and impact fees are also a key funding source and are assessed for traffic, housing, water and wastewater capacity, parks and recreation, civic facilities, General Plan implementation, and fire district mitigation. These fees help ensure that new development contributes to infrastructure needed to safely accommodate growth.

Yountville has the authority to use general obligation bonds and special tax or revenue bonds to finance large capital projects, providing flexibility to fund hazard mitigation–related infrastructure improvements when voter approval or project-specific revenues are available. The Town also adopts a Capital Improvement Program (CIP) tied to the annual budget, which prioritizes investments in infrastructure that supports public safety and resilience.

Additional funding sources include Community Development Block Grants (CDBG), which can be used for hazard-related housing rehabilitation and infrastructure improvements, particularly for vulnerable populations. While special-purpose taxes and benefit assessments are not consistently used, the town has the authority to pursue voter-approved tax measures for specific purposes, such as public safety or infrastructure, representing a future opportunity to expand mitigation funding.

Education & Outreach

The Town of Yountville has strong education and outreach capabilities that support public awareness, preparedness, and risk reduction for natural hazards. The Town maintains a dedicated emergency preparedness webpage, Alert Napa County, which centralizes information on alerts, evacuations, flooding, wildfire, earthquakes, power shutoffs, and other hazards. This resource serves as the primary hub for hazard-related public information.

The Town actively uses social media platforms, including town websites, Facebook, Instagram, Nextdoor, and YouTube, to disseminate emergency information, preparedness messaging, and real-time updates during incidents. These digital tools are complemented by participation in annual public safety and preparedness events, such as the Great California ShakeOut and Ready Napa County initiatives.

Yountville supports community-based preparedness through the Community Emergency Response Team (CERT) program and partnerships with regional organizations, including local Fire Safe Councils and the Napa Communities Firewise Foundation. The Town also collaborates with the Napa County Resource Conservation District, which provides outreach related to wildfire, drought, and other environmental hazards.

Town staff are available to respond to public inquiries and provide technical assistance related to hazard preparedness, floodplain regulations, and development standards through phone, email, and web-based requests. While hazard information is primarily disseminated online, printed materials and library-based resources are used on a limited basis, representing an opportunity for expanded outreach to residents with limited digital access.

ASSESSMENT LEGEND

HMP Integration

Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Table 5-15: Town of Yountville Capabilities and Opportunities Assessment

	HMP Integration			
Resource	Status	Current Mitigation Use	Future Opportunity	**Notes / Additional Detail**
Planning and Regulatory Capabilities				
Construction and Future Development Regulations				
Building Codes				
BCEGS Rating				
Public Protection (ISO Class)				
Hazard-Related Development Standards				Hazard-related development standards implemented through Titles 15, 16, and 17, including Zoning and Subdivision Design/Development Standards, Water Efficient Landscaping, and Floodplain Management Regulations
Zoning Ordinance				Zoning Ordinance administered by Planning & Building under Municipal Code Title 17
Hazard-Specific Ordinance				Hazard-specific ordinances include Fire Regulations, Floodplain Management, Tree Preservation, Water Conservation, and Stormwater Regulations
Growth Management Ordinance				2019 General Plan, including Land Use Element
Hazard Reduction Programs (Annually Conducted)				
Capital Improvements Program (CIP) or Plan				CIP covers seven project areas, including Drainage & Flood Control, Streets and Transportation, and Water Distribution

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Erosion/Sediment Control Program				Municipal Code Title 13 establishes stormwater management and erosion/runoff controls and standards; Town participates in the countywide stormwater program (NCSPPP) for construction BMPs and compliance
Hazard-Related Public Outreach Program				Emergency Preparedness webpage, social media, resources, and alerts enrollment
Urban Water Management Plan				Water Conservation Plan and Napa Valley Drought Contingency Plan; groundwater planning coordinated with County's Napa Valley Subbasin GSP
Stormwater Management Program (Annual Inspections)				Implements stormwater management program and coordinates with NCSPPP for inspections, compliance, and public education
Seismic Safety Program (Non-structural)				2019 General Plan Safety & Hazards Elements and Earthquake Preparedness webpage
Earthquake Modernization Plan (Building Safety)				No standalone earthquake modernization program; building safety managed through California Building Code adoption and enforcement
Hazard Plans				
General Plan Safety Element				General Plan Safety & Hazards Element covers seismic, geologic, flood, fire, and climate change hazards (amended in 2024 under Resolution No. 24-4309)
Site Plan Review Requirements				Title 17 establishes site design review and permitting procedures
General Plan Environmental Justice Element				No standalone element, but General Plan Land Use Element contains an EJ section
Community Wildfire Protection Plan (CWPP)				Follows 2021 Napa County Community Wildfire Protection Plan
Economic Development Plan				2019 General Plan History, Community and Economic Sustainability Element
Floodplain Management Plan				2019 General Plan Safety & Hazards Element and Title 15 Floodplain Management Regulations
Stormwater Management Plan				Town participates in Napa Countywide Stormwater Pollution Prevention Program; CIP drainage projects
Emergency Operations Plan				2024 Napa County EOP and Town of Yountville Annex
Climate Action Plan				2016 Climate Action Plan
Climate Vulnerability Assessment				No town-specific assessment, but regional climate vulnerability assessed through countywide RCAAP/CAC process

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Urban Greening Plan				General Plan Open Space & Conservation Element
Ground Water Management Planning / Plans				Groundwater planning coordinated with County's Napa Valley Subbasin GSP; Town runs recycled-water and water-conservation programs
National Flood Protection Program (NFIP)				
Floodplain Management Regulations				Title 15 Floodplain Management Regulations
Flood Insurance Education and Technical Assist.				Floodplain Management webpage and technical assistance from Public Works Dept staff
Flood Insurance Study				2016 FEMA FIS 06055CV000C
Elevation Certificates				Maintained by Public Works Dept
Flood Hazard Mapping / Re-Mapping				FEMA FIRMs effective 2008 and 2016
Community Rating System (CRS)				Not currently participating; future opportunity but limited by staff capacity
Administrative and Technical				
Community Planning and Development Services				
Community Planner				Dedicated staff in Planning and Building Dept
Planner/Engineer (Land Development)				Dedicated staff in Planning and Building and Public Works Depts
Engineer/Professional (Construction)				Dedicated staff in Public Works Dept
Planner/Engineer/Scientist (Natural Hazards)				Shared among staff in Public Works Dept
Transportation Planner				Shared among staff in Public Works Dept
Resiliency Planner				No dedicated staff; shared among Planning and Building Dept staff
Building Code Official (Full time or Augmented)				Building Official in Planning and Building Dept
Floodplain Administrator				Director of Public Works Dept
Fire Marshal				By contract with Napa County Fire Dept/CAL FIRE
Dedicated Public Outreach Personnel				Shared among staff in Town Manager's Office and Town Clerk and Communications, Planning and Building, and Public Works Depts
GIS Specialist and Capability				Dedicated staff in Administration Dept; supported by Napa County GIS

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Emergency Manager				No dedicated staff; supported by Napa County OES
Dedicated Grant Manager, Writer, or Specialist				Shared among staff in Administration, Finance, Public Works, and Planning and Building Depts
Other	N/A	N/A	N/A	
Warning Systems/Services				
General				ALERT Napa County, Nixle, local radio, social media and Hi-Lo sirens
Flood				ALERT Napa County, Nixle, local radio, social media and Hi-Lo sirens
Tornado				ALERT Napa County, Nixle, local radio, social media and Hi-Lo sirens
Wildfire				ALERT Napa County, Nixle, local radio, social media and Hi-Lo sirens
Geological Hazards				ALERT Napa County, Nixle, local radio, social media and Hi-Lo sirens
Fiscal Capabilities				
Financial Resources for Hazard Mitigation				
Levy Taxes for Specific Purposes				Not consistently applied, but can place special tax measures on ballot for specific purposes (e.g., sales tax for public safety)
Utilities Fees				Water and wastewater utility service and impact fees
Benefit assessments				Not currently used; future opportunity
Community Development Block Grants				Recieved via HUD; can support hazard-related housing rehabilitation and infrastructure
System Development Fee				Collected as system impact fees for water, drainage, floodplain control, etc.
General Obligation Bonds to Incur Debt				General obligation bonds are available financing tools
Special Tax Bonds to Incur Debt				Special tax/revenue bonds are authorized for specific projects
Withheld Spending in Hazard-Prone Areas				General Plan policies restrict development in hazard-prone areas
Stormwater Service Fees				Collected as drainage impact and grading permit fees
Capital Improvement Project Funding				CIP funds support infrastructure upgrades and community resilience
Education / Outreach Capabilities				

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Education/Outreach Resources				
Website Dedicated to Hazard Topics				Emergency Preparedness webpage through Town Manager's Office
Dedicated Social Media				Facebook, YouTube, and other social media used for emergency preparedness and hazard tips; Yountville Ready initiatives
Local Citizen Groups That Communicate Hazard Risks				Napa Communities Firewise Foundation, Fire Safe Councils
Hazard Info. Avail. at Library/ Planning Desk				Hazard info available via City website and partner websites
Annual Public Safety Events				Participates in Earthquake ShakeOut, Ready Napa County, and other regular events; Yountville Ready initiative with regular cookouts with public safety partners
Ability to Field Public Tech. Assistance Requests				Staff respond to inquiries via phone, email, and web forms; department-specific technical assistance available
Public Safety Newsletters or Printed Outreach				Bi-weekly newsletter with preparedness topics
Community Emergency Response Team (CERT)				Napa County CERT
Fire Safe Councils				Active Fire Safe Councils in surrounding area; Napa Community Firewise Foundation
Firewise				Not currently designated, but supported by Napa Communities Firewise Foundation
StormReady				Not currently designated
Resource Conservation Districts				Napa County RCD provides outreach on wildfire, drought, and other hazard topics; City participates through partnerships
Other	N/A	N/A	N/A	

5.6.2 Town of Yountville Mitigation Action Plan

Yountville's mitigation actions were developed through a collaborative process informed by the updated risk assessment, local priorities, and extensive stakeholder engagement. As part of this 2026 MJHMP update, the town reviewed mitigation actions from its prior Local Hazard Mitigation Plan to determine which actions to carry forward, which to consolidate, and where entirely new strategies were required. This careful evaluation ensured that the updated action plan builds upon past commitments while also responding to current risks and future challenges.

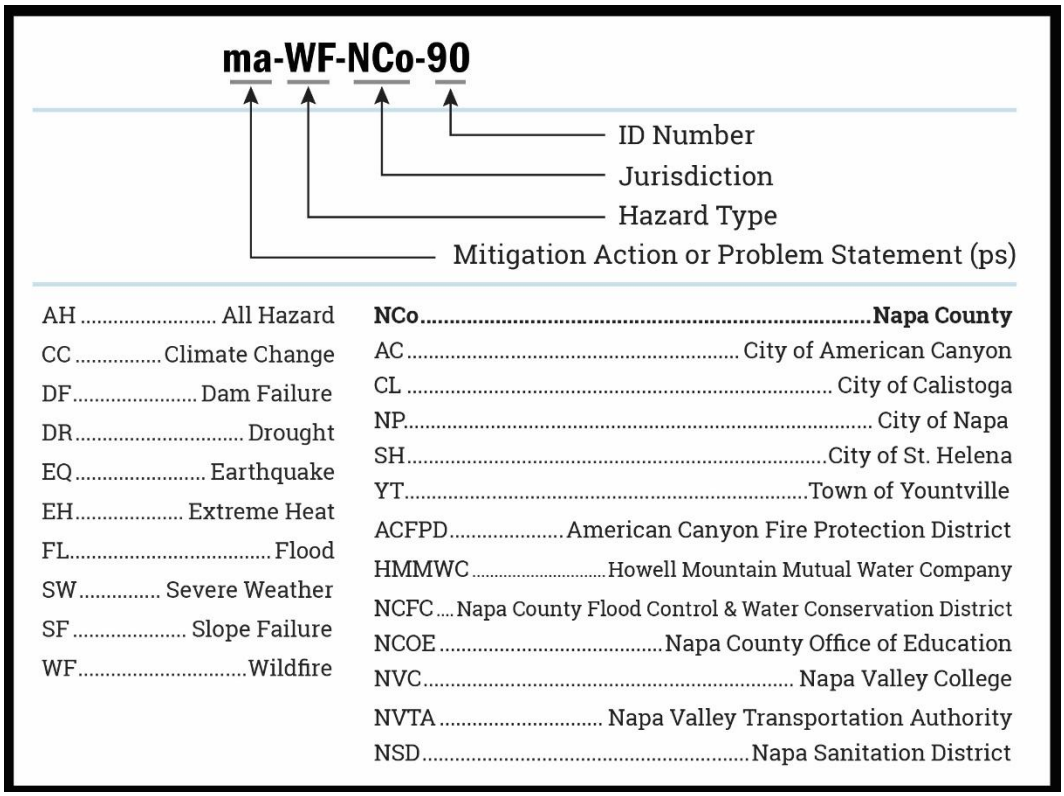


Figure 5-18: Mitigation Action Number Key

The plan addresses Yountville's most significant hazards, including wildfire, earthquake, flood, slope failure, drought, dam failure, and extreme weather. Each mitigation action is designed to align with FEMA's hazard mitigation guidance and the requirements of the Disaster Mitigation Act of 2000. Where appropriate, overlapping or redundant actions were consolidated into broader, more comprehensive strategies that improve clarity, increase feasibility, and strengthen regional coordination.

The mitigation action prioritization method used by all participating jurisdictions is described in Volume 1, Section 4. Each action specific to Yountville is documented in Table 5-16, which identifies the responsible department, implementation timeframe, potential funding sources, and resources required to complete the action. Each action is also assigned a unique alphanumeric identifier (see Figure 5-18) that links the strategy to its associated hazard and supports consistent monitoring and reporting.

Yountville's approach recognizes that some hazards are most effectively addressed through regional efforts. Flood protection, drought resilience, and wildfire risk reduction often extend beyond the town's boundaries and require collaboration with county, regional, and state partners. By aligning local actions with regional

strategies, Yountville helps to consolidate resources, maximize funding opportunities, and ensure that mitigation projects achieve the greatest benefit for the Napa Valley and the wider Napa County community.

Collectively, these mitigation actions provide a roadmap for reducing hazard risk, protecting vulnerable populations, and strengthening the long-term resilience of Yountville.

Table 5-16: Town of Yountville Mitigation Action Plan

Mitigation No.	Hazard Type	Sub-Hazard	Mitigation Type	Year	Primary Agency	Title	Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Problem Statements
ma-AH-YT-224	All Hazard		PE&A - Public Education & Awareness , ES - Emergency Services	2026	Town of Yountville	Enhanced Emergency Shelter Network	In collaboration with Napa County and other partners, identify new emergency shelter options and upgrade existing shelters with backup power, ADA accommodations, improved HVAC systems, and other enhancements to address a variety of hazard scenarios and community needs. Also develop a transportation assistance program that identifies and supports vulnerable populations with limited mobility in accessing the shelter network.	Planning & Building Department	High	Medium	5-10 Years	Project	HMGP / BRIC , CDBG DRI , General Fund	High	ps-CC-YT-12, ps-DF-YT-29, ps-EH-YT-346, ps-EH-YT-347, ps-WF-YT-344, ps-WF-YT-345
ma-DF-YT-226	Dam Failure		PE&A - Public Education & Awareness , ES - Emergency Services	2020	Town of Yountville	Dam Inundation Awareness & Response	Update public awareness signage, emergency notification, and evacuation route planning, and improve community education efforts for areas downstream of Veterans Home and Conn Creek Dams.	Town Manager's Office	Low	Medium	1-3 Years	Capacity / Capability Building	HMGP / BRIC , General Fund	Low	ps-DF-YT-30, ps-DF-YT-29
ma-DR-YT-31	Drought		PE&A - Public Education & Awareness	2020	Town of Yountville	Drought Resilience Support Program	Develop and implement a drought education and support program with targeted outreach to seniors and low-income households and incentives for home water-efficiency improvements.	Town Manager's Office	Low	Medium	1-3 Years	Capacity / Capability Building	HMGP / BRIC , General Fund	High	ps-DR-YT-43, ps-DR-YT-336, ps-DR-YT-337
ma-EQ-YT-45	Earthquake		PE&A - Public Education & Awareness	2020	Town of Yountville	Earthquake Outreach & Education	Enhance earthquake outreach efforts with focus on renters and low-income households, insurance, and available retrofit resources through annual events, website updates, social media posts, and printed media.	Town Manager's Office	Low	Medium	1-3 Years	Capacity / Capability Building	HMGP / BRIC , General Fund	Medium	ps-EQ-YT-72, ps-EQ-YT-73, ps-EQ-YT-74, ps-EQ-YT-338, ps-EQ-YT-339
ma-EH-YT-227	Extreme Heat		NRP - Natural Resource Protection , SP - Structural Projects	2026	Town of Yountville	Community Cooling Measures	Develop and implement community cooling measures, including urban forest expansion, installing shade structures along pedestrian corridors and in public spaces, and removal and replacement of dark, heat-absorbing urban surfaces.	Public Works Department	High	High	3-5 Years	Project	HMGP / BRIC , General Fund	Medium	ps-EH-YT-346, ps-EH-YT-347, ps-CC-YT-335
ma-FL-YT-73	Flood		NRP - Natural Resource Protection , SP - Structural Projects	2020	Town of Yountville	Floodplain Restoration & Drainage Improvements	Identify key areas with reoccurring flooding, especially during heavy rain events, and implement drainage upgrades and floodplain restoration projects to improve conveyance capacity and stormwater system resilience, including through nature-based solutions that improve habitat and water quality.	Public Works Department	High	High	3-5 Years	Project	HMGP / BRIC , FMA , General Fund	High	ps-FL-YT-116, ps-FL-YT-340
ma-SW-YT-72	Severe Weather		PRV - Prevention , PE&A - Public Education & Awareness , ES - Emergency Services , SP - Structural Projects	2020	Town of Yountville	Severe Weather Notification System	Enhance the existing notification system for severe weather events, including heavy rain and flooding, high wind, and winter storms, to achieve real-time threat recognition through warning system upgrades (e.g., stream gauges) and improved prediction integration with NWS and County alerting.	Town Manager's Office	Medium	Medium	1-3 Years	Project	HMGP / BRIC , General Fund	Medium	ps-DF-YT-29, ps-DF-YT-30, ps-SW-YT-341, ps-SW-YT-342, ps-SW-YT-343

Mitigation No.	Hazard Type	Sub-Hazard	Mitigation Type	Year	Primary Agency	Title	Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Problem Statements
ma-SW-YT-225	Severe Weather	High Wind	PPRO - Property Protection , NRP - Natural Resource Protection , ES - Emergency Services , SP - Structural Projects	2026	Town of Yountville	High Wind Facility & Corridor Hardening	Develop a program to regularly conduct tree risk assessments and mitigation along major access routes and around critical facilities. Install backup power for critical facilities.	Public Works Department	Medium	High	3-5 Years	Capacity / Capability Building	HMGP / BRIC , General Fund	Medium	ps-SW-YT-343, ps-SW-YT-342, ps-SW-YT-341
ma-WF-YT-109	Wildfire		PE&A - Public Education & Awareness , NRP - Natural Resource Protection	2020	Town of Yountville	Wildfire Mitigation Outreach & Education	Work with Napa Firewise to develop a wildfire mitigation education program that communicates requirements around and encourages access improvements, adequate addressing and water supply, vegetation management, and structure hardening.	Town Manager's Office	Low	Medium	1-3 Years	Capacity / Capability Building	HMGP / BRIC , General Fund , CalFIRE	High	ps-WF-YT-176, ps-WF-YT-177, ps-WF-YT-345

5.6.3 Status of Previous Mitigation Actions

In 2020, the Town of Yountville adopted its previous FEMA-approved HMP. This 2026 MJHMP represents a comprehensive update from that previous plan, as discussed in Volume 1, Section 1.5. Table 5-17 provides status updates for all of the previous mitigation actions in the Town of Yountville HMP, from which many of the mitigation actions in Table 5-16 were sourced and revised.

Table 5-17: Town of Yountville Status of Previous Mitigation Actions

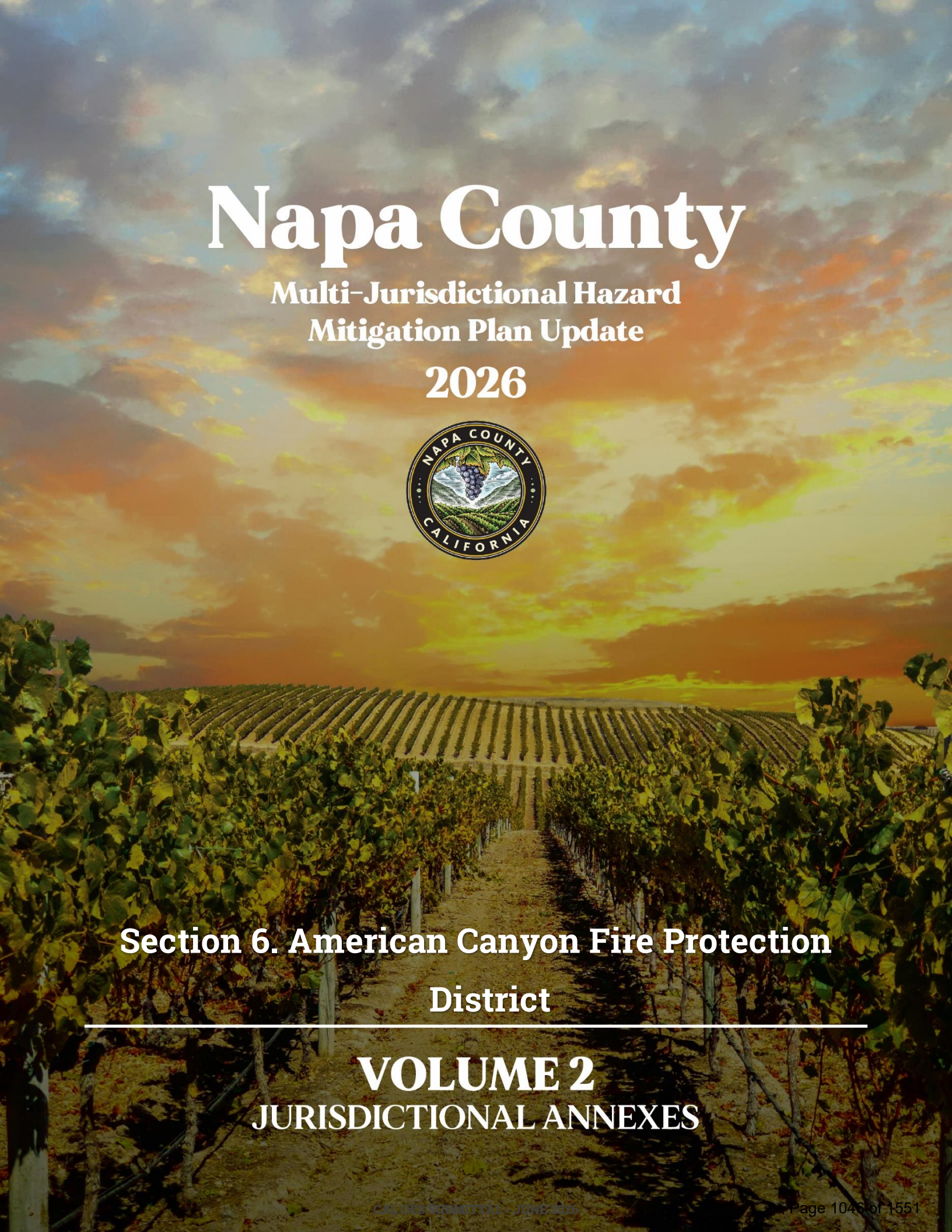
Mitigation No.	Hazard Type	Status	Year	Primary Agency	Title/Description	Reason Cancelled/ Completed
ma-DF-YT-226	Dam Failure	Ongoing	2020	Town of Yountville	Dam Inundation Awareness & Response	Revised
ma-DR-YT-31	Drought	Ongoing	2020	Town of Yountville	Drought Resilience Support Program	Revised
ma-EQ-YT-45	Earthquake	Ongoing	2020	Town of Yountville	Earthquake Outreach & Education	Revised
ma-FL-YT-73	Flood	Ongoing	2020	Town of Yountville	Floodplain Restoration & Drainage Improvements	Revised
ma-FL-YT-72	Flood	Ongoing	2020	Town of Yountville	Severe Weather Notification System	Revised
ma-WF-YT-109	Wildfire	Ongoing	2020	Town of Yountville	Wildfire Mitigation Outreach & Education	Revised
ma-CC-YT-122	Climate Change	Cancelled	2020	Town of Yountville	Develop a public education campaign to spread awareness on the increasing effects of climate change and everyday actions citizens can take to conserve water and minimize their carbon footprint	YV-01-2020 & YV-203-2020 combined and revised
ma-FL-YT-74	Flood	Cancelled	2020	Town of Yountville	Secure grant funding for a river restoration program to reduce flood damage, enhance environmental quality, and maintain fish habitat.	YV-03-2020 & YV-04-2020 combined and revised
ma-FL-YT-75	Flood	Cancelled	2020	Town of Yountville	Invest in flood prediction modeling to support Napa County's floodplain management, hazard identification, risk assessment, and climate adaptation efforts.	YV-02-2020, YV-07-2020 & YV-08-2020 combined and revised
ma-FL-YT-76	Flood	Cancelled	2020	Town of Yountville	Enhance the existing flood notification program to achieve real-time flood threat recognition capability.	YV-02-2020, YV-07-2020 & YV-08-2020 combined and revised

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Napa County

Multi-Jurisdictional Hazard Mitigation Plan Update

2026



Section 6. American Canyon Fire Protection District

VOLUME 2
JURISDICTIONAL ANNEXES

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Napa County

2026 Multi-Jurisdictional Hazard Mitigation Plan Update

American Canyon Fire Protection District (ACFPD)

Special District Annex

Section 6. American Canyon Fire Protection District 6-7

6.1 Scope & Purpose 6-7

6.2 Jurisdictional Setting 6-7

6.2.1 Geography & Climate 6-8

6.2.2 Demographics & Vulnerable Populations 6-11

6.2.3 Economy 6-24

6.2.4 Growth Trends & Future Development 6-24

6.3 Planning Process 6-25

6.3.1 Public Input & Draft Review 6-28

6.4 What's New 6-28

6.4.1 Mitigation Activities 6-28

6.4.2 Mitigation Successes 6-29

6.5 Risk Assessment 6-32

6.5.1 Hazard Screening & Prioritization 6-32

6.5.2 Vulnerability to Specific Hazards 6-36

6.5.3 Climate Change Impacts & Vulnerable Populations 6-47

6.5.4 Hazard Problem Statements 6-48

6.6 Mitigation Strategy 6-50

6.6.1 Capabilities & Opportunities 6-51

6.6.2 American Canyon Fire Protection District Mitigation Action Plan 6-61

List of Figures

Figure 6-1: ACFPD Geographic Overview Map 6-10
Figure 6-2: ACFPD Median Household Income Map 6-13
Figure 6-3: ACFPD Poverty Status Map 6-14
Figure 6-4: ACFPD Housing Occupancy Map 6-15
Figure 6-5: ACFPD Dependent Age Groups Map 6-17
Figure 6-6: ACFPD Disabled Elderly Map 6-18
Figure 6-7: ACFPD Race and Ethnicity Map 6-20
Figure 6-8: ACFPD Spanish-Speaking Households Map 6-21
Figure 6-9: ACFPD CDC Social Vulnerability Index Map 6-23
Figure 6-10: ACFPD Targeted Sheep Grazing 6-30
Figure 6-11: Extrication Tools Purchased from Grant 6-31
Figure 6-12: ACFPD Risk Assessment Matrix 6-34
Figure 6-13: Exposure Summary – ACFPD Wildfire Risk 6-38
Figure 6-14: Exposure Summary – ACFPD Earthquake Risk (M7.1 Hunting Creek–Berryessa) 6-40
Figure 6-15: Exposure Summary – ACFPD Earthquake Risk (M6.7 West Napa) 6-41
Figure 6-16: Exposure Summary – ACFPD Sea Level Rise 6-46
Figure 6-17: Mitigation Action Number Key 6-61

List of Tables

Table 6-1: ACFPD Planning Team and Steering Group Members 6-25
Table 6-2: ACFPD Planning Team Meetings 6-27
Table 6-3: ACFPD Document Review of Potential Hazards 6-33
Table 6-4: ACFPD Hazards Prioritization Summary 6-35
Table 6-5: ACFPD Hazard Problem Statements 6-48
Table 6-6: ACFPD Capabilities and Opportunities Assessment 6-57
Table 6-7: ACFPD Mitigation Action Plan 6-63

Adoption Resolution

To comply with the Federal Disaster Mitigation Act of 2000 (DMA 2000), the American Canyon Fire Protection District Board of Directors has officially adopted this 2026 Napa County Multi-Jurisdictional Hazard Mitigation Plan, including Volume 1 in its entirety as well as this Volume 2 municipal annex. The adoption of the MJHMP recognizes the district's commitment to reducing the impacts of natural hazards within its jurisdiction and across Napa County.

A copy of the district's adoption record is provided on the following pages. Adoption records for all jurisdictions are summarized in Volume 1, Table ES-1.

ADOPTION RECORD TO BE INSERTED UPON COMPLETION.

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Section 6. American Canyon Fire Protection District

6.1 Scope & Purpose

This Jurisdictional Annex for the American Canyon Fire Protection District (ACFPD) of the 2026 Napa County Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) details the hazard mitigation planning elements specific to the district's planning area. The annex is not intended to be a standalone document but appends to and supplements the information contained in the umbrella plan document (Volume 1). As such, all sections of the umbrella plan, including the planning process and other procedural requirements, apply to and were met by the district. This annex provides additional information specific to the district, with a focus on hazard identification and risk assessment, vulnerability assessment, problem statements, mitigation strategy, and capabilities assessment. Below are ACFPD's Points of Contact:

Primary Point of Contact	Alternate Point of Contact
Geoff Belyea, Fire Chief American Canyon Fire Protection District 911 Donaldson Way, E American Canyon, CA 94503 Telephone: (707) 551-0650 email: gbelyea@amcanfire.com	Cliff Campbell, Asst Fire Chief American Canyon Fire Protection District 911 Donaldson Way, E American Canyon, CA 94503 Telephone: (707) 551-0650 email: ccampbell@amcanfire.com

6.2 Jurisdictional Setting

The ACFPD is an independent special district located in southern Napa County, California, providing fire protection, emergency medical services, fire prevention, and related emergency response services to the City of American Canyon and select unincorporated areas of southern Napa County. The district serves an area of approximately 7 square miles, encompassing a mix of residential neighborhoods, commercial and industrial development, transportation corridors, open space, wetlands, and wildland–urban interface (WUI) areas.

American Canyon is situated at the southern end of the Napa Valley, near the northeastern edge of the San Pablo Bay. The district's jurisdiction is bounded generally by the Napa River and adjacent wetland preserve to the west, the foothills of the Sulphur Springs Mountain Range to the east, the City of Vallejo to the south, and the Napa County Airport and agricultural lands to the north. This geographic setting creates a diverse hazard environment, including flood-prone lowlands, seismically active areas, transportation and industrial risk corridors, and wildfire-susceptible hillside terrain.

The district's location at a regional transportation crossroads, near State Route 29 and other arterial routes, supports significant industrial and logistics uses, including wine processing, storage, bottling, and distribution facilities.

ACFPD was originally established in 1955 and formally recognized by the State of California in 1957. Following the incorporation of the City of American Canyon in 1992, the district continued to operate as a subsidiary special district serving the city and surrounding areas.

The district is governed by a five-member elected Board of Directors, which serves as the policymaking body and provides financial oversight and strategic direction. Day-to-day operations are managed by the Fire Chief, who serves as the Chief Executive Officer of the District and is responsible for administration, emergency response, personnel, and coordination with partner agencies.

Fire protection and emergency medical services for the City of American Canyon are provided through ACFPD, while the City retains responsibility for land use planning, development approvals, public works, utilities, and other municipal services. The district coordinates closely with city departments on development review, fire prevention, emergency access, and infrastructure planning, particularly as new residential, commercial, and industrial projects are constructed within District boundaries.

In addition to city areas, ACFPD also provides service to portions of unincorporated southern Napa County under established service arrangements. The district works in coordination with Napa County, neighboring fire agencies, and regional mutual aid partners to support large-scale emergency response, disaster operations, and specialized incidents.

American Canyon has experienced steady population growth and development over the past decade, with continued residential expansion, commercial investment, and industrial intensification anticipated in coming years. New housing subdivisions, hotels, and industrial facilities contribute to increased service demand for emergency response, fire prevention inspections, and disaster preparedness.

To support growth-related impacts, ACFPD relies on a combination of property tax revenue, fire service and assessment fees, development impact fees, and other funding mechanisms to maintain current service levels and plan for future capital needs.

ACFPD's location within Napa County and the State of California are shown in Figure 6-1.

- **Year of Incorporation:** 1957
- **Service area:** ~7 square miles
- **Approximate Population Served:** 21,801 (includes City of American Canyon)

6.2.1 Geography & Climate

ACFPD is located in southern Napa County, California, at the southern gateway to the Napa Valley and along the northeastern edge of the San Pablo Bay. The district's service area includes the entirety of the City of American Canyon as well as select unincorporated areas of southern Napa County. Its geographic position places the district at the intersection of coastal, valley, and foothill environments, resulting in a diverse range of physical conditions and hazard exposures.

The western portion of the district is defined by low-lying terrain adjacent to the Napa River and extensive wetland preserve areas connected to the San Pablo Bay. These areas are particularly susceptible to riverine flooding, tidal influences, and the compounding effects of sea level rise during major storm events. Much of

the central and western developed area lies on relatively flat valley floor terrain, supporting residential neighborhoods, commercial centers, industrial facilities, and major transportation corridors.

Moving eastward, the district transitions into rolling hills and the lower foothills of the Sulphur Springs Mountain Range. These upland areas contain grasslands, open space, and residential development that interface directly with wildland vegetation, creating wildland–urban interface conditions. The topographic variation in these areas contributes to increased wildfire exposure, access and evacuation challenges, and localized slope instability. In addition, the district's proximity to regional transportation routes and its role as a hub for wine processing, storage, and distribution introduce elevated structural fire risk, hazardous materials exposure, and transportation-related incident potential within the jurisdiction.

American Canyon experiences a Mediterranean climate characterized by cool, wet winters and warm, dry summers. The majority of annual precipitation occurs between November and March, when Pacific storm systems can bring prolonged or intense rainfall averaging ~18 inches. Summers are generally dry, with extended periods of low humidity and elevated temperatures. This seasonal precipitation pattern contributes to both winter flood risk and summer drought and wildfire conditions.

Average daily temperatures are moderated by the district's proximity to San Pablo Bay, though inland heat can develop during summer months, particularly in eastern portions of the city farther from marine influence. Average summer temperatures range from the high 70s to mid-90s°F (25–35°C), while winter temperatures typically range from the mid-40s to low 60s°F (7–16°C). Climate change projections for the region indicate continued warming trends, increased variability in precipitation, more intense storm events, longer dry periods, and rising sea levels.

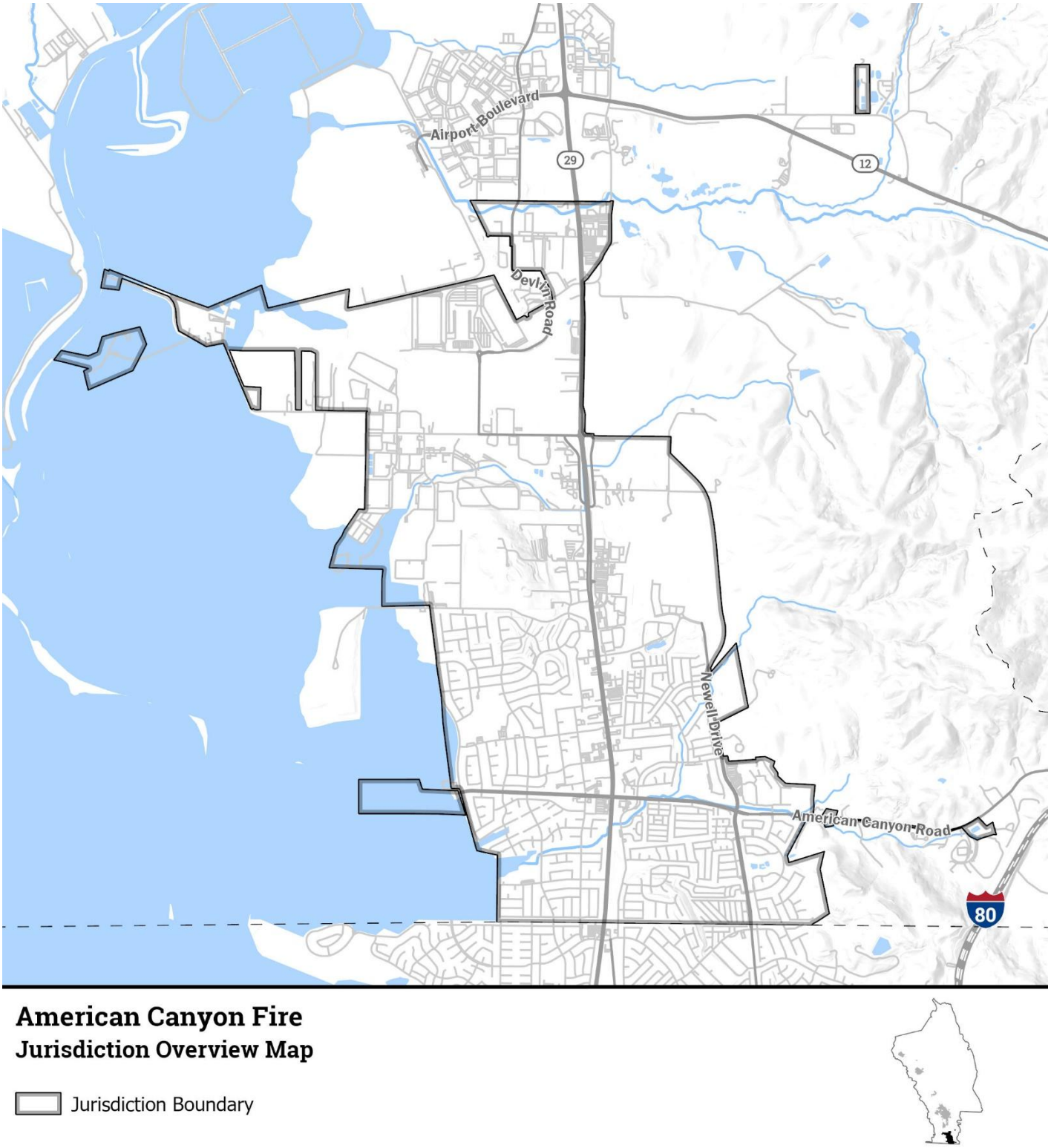


Figure 6-1: ACFPD Geographic Overview Map

6.2.2 Demographics & Vulnerable Populations

ACFPD serves a diverse and growing population centered within the City of American Canyon, which is the second-largest city in Napa County. Population growth within the district has increased demand for emergency response, fire prevention services, and disaster preparedness, particularly in newly developed residential areas and higher-density housing.

American Canyon's population is characterized by substantial racial, ethnic, and cultural diversity. The community includes a large proportion of Hispanic and Latino residents, along with significant Asian populations. Many households include multigenerational families, and languages other than English are commonly spoken at home. These demographic characteristics underscore the importance of culturally appropriate emergency communication, multilingual outreach, and inclusive hazard mitigation strategies to ensure all residents receive timely and actionable information before, during, and after emergencies.

The district also serves several populations that may be disproportionately vulnerable to the impacts of natural hazards. These include older adults, individuals with disabilities, persons with access or functional needs, and lower-income households. Older adults may be more susceptible to heat-related illness, medical complications during power outages, and mobility limitations during evacuations. Individuals with disabilities or access and functional needs may require additional assistance, specialized equipment, or advance planning to safely respond to emergencies such as wildfires, flooding, or earthquakes.

Lower-income households and renters may face increased challenges related to hazard mitigation and recovery, including limited access to insurance, fewer resources for home retrofits, and reduced ability to absorb the financial impacts of disasters. In addition, residents employed in service, industrial, and agricultural support sectors may face heightened exposure to hazards due to workplace conditions, transportation dependencies, or limited schedule flexibility during emergency events.

American Canyon also contains several land uses and facilities that support vulnerable populations, including schools, childcare facilities, senior housing, healthcare-related services, and community facilities. These sites require special consideration in emergency planning due to occupant characteristics, evacuation needs, and continuity-of-operations requirements. Disruptions to utilities, transportation, or emergency access can have disproportionate consequences for these populations during hazard events.

6.2.2.1 Income & Housing

Household income and housing conditions within ACFPD vary spatially across the district and play an important role in shaping vulnerability to natural hazards and the capacity for preparedness, response, and recovery. Analysis of American Community Survey (ACS) data illustrates distinct geographic patterns in both median household income and poverty rates within the district, reflecting differences in housing stock, development history, and land use.

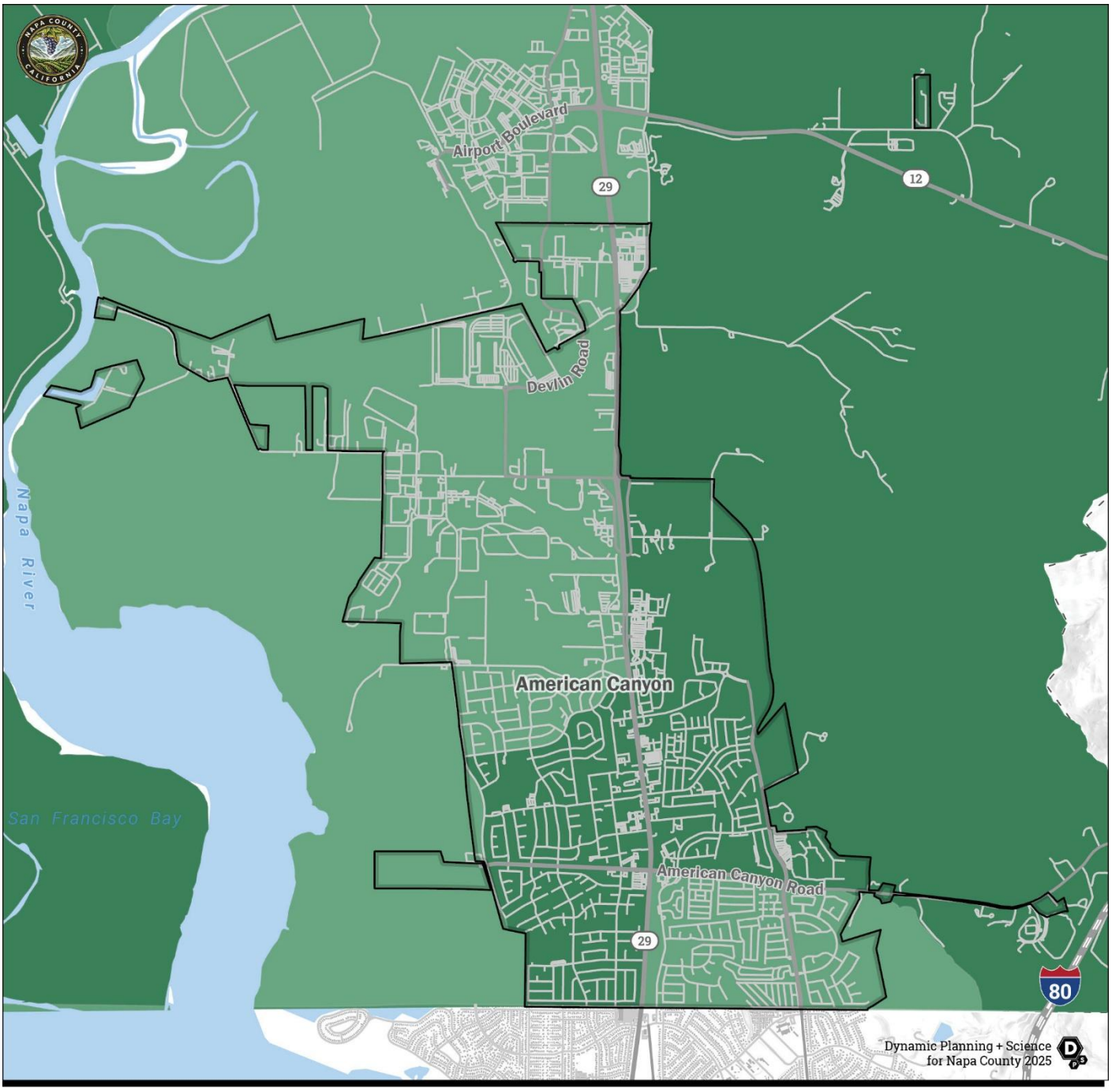
As shown in Figure 6-2, median household income across much of the district is relatively high, particularly in central and northern residential areas and newer developments. These areas generally exhibit household

incomes at or above regional averages, which can support greater access to insurance, home retrofitting, emergency supplies, and post-disaster recovery resources. Higher-income neighborhoods may also have newer housing stock that benefits from more recent building codes and hazard-resistant construction standards.

In contrast shown in Figure 6-3, lower median household incomes are more prevalent in portions of the southern and eastern areas of the district, as well as near older residential neighborhoods and higher-density housing areas. These same areas correspond with higher concentrations of households experiencing poverty, as shown in the poverty status map. These areas may be more sensitive to service disruptions and recovery delays following hazard events due to limited financial resources.

Housing characteristics further influence vulnerability within the district. Areas with higher poverty rates are more likely to contain older homes, rental properties, and multifamily housing, which may be less likely to have been retrofitted for seismic safety, flood protection, or wildfire resilience. Renters may have limited authority or resources to invest in structural mitigation measures and may face greater displacement risk following a disaster. Additionally, households with limited financial resources may experience challenges evacuating, securing temporary housing, or returning to normal conditions after an emergency.

Housing occupancy patterns within the American Canyon Fire Protection District vary geographically and provide important insight into community vulnerability and resilience. As shown in Figure 6-4, many central and northern neighborhoods exhibit high rates of owner-occupied housing, indicating greater housing stability and a higher likelihood of long-term investment in property maintenance and hazard mitigation measures. In contrast, portions of the southern and eastern areas of the district show lower percentages of owner-occupied units and correspondingly higher concentrations of renter-occupied housing. These areas may face increased vulnerability during hazard events, as renters often have limited ability to implement structural mitigation improvements and may be at greater risk of displacement following disasters. Higher renter concentrations can also complicate emergency communication, evacuation coordination, and post-disaster recovery, particularly when coupled with lower household incomes or higher poverty rates.



ACS Median Household Income

American Canyon Fire Protection District

*Data sources: ESRI Demographics Service, ACS.

Median Household Income

> $119,300

< $37,800

No Value

Figure 6-2: ACFPD Median Household Income Map

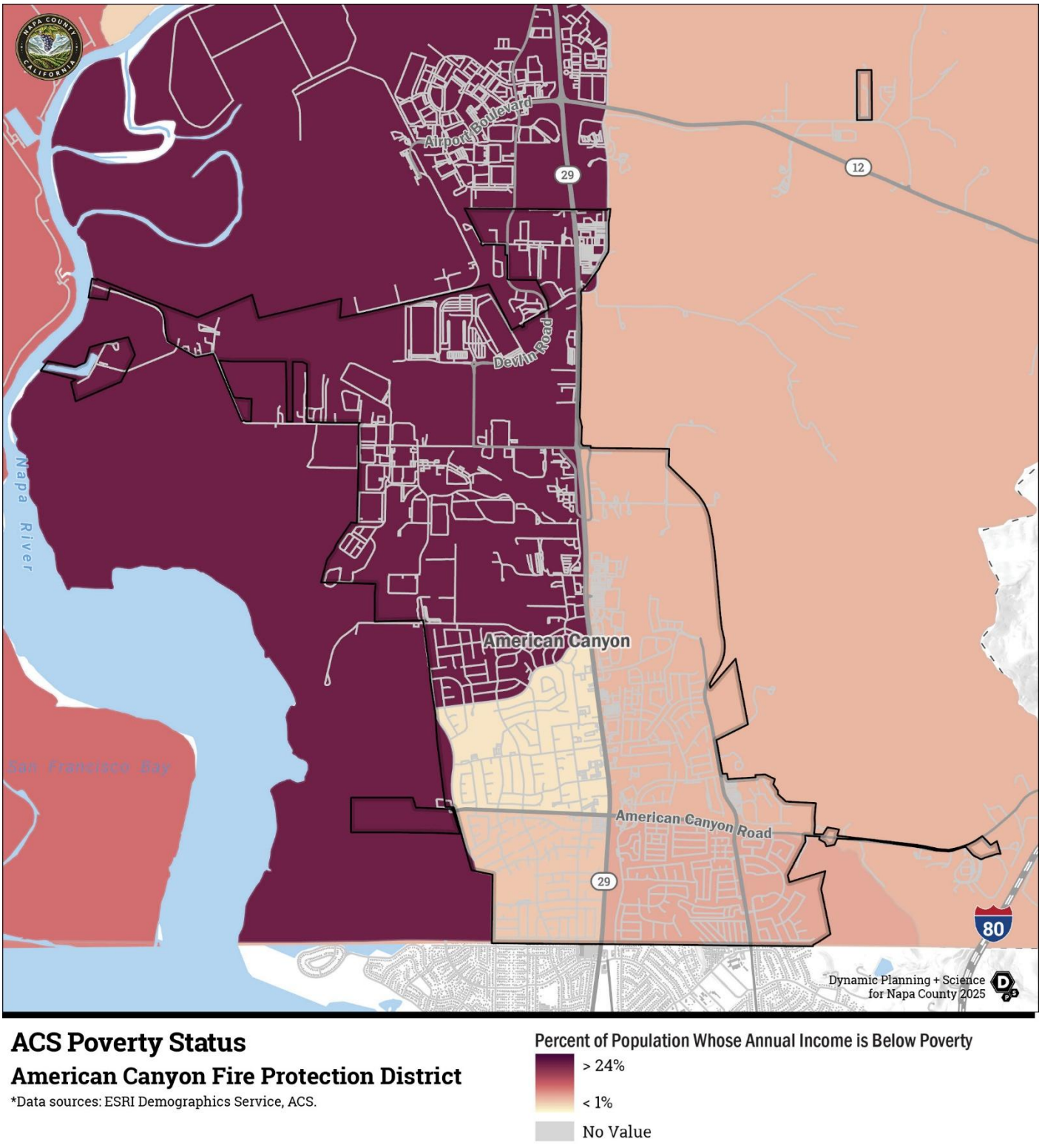
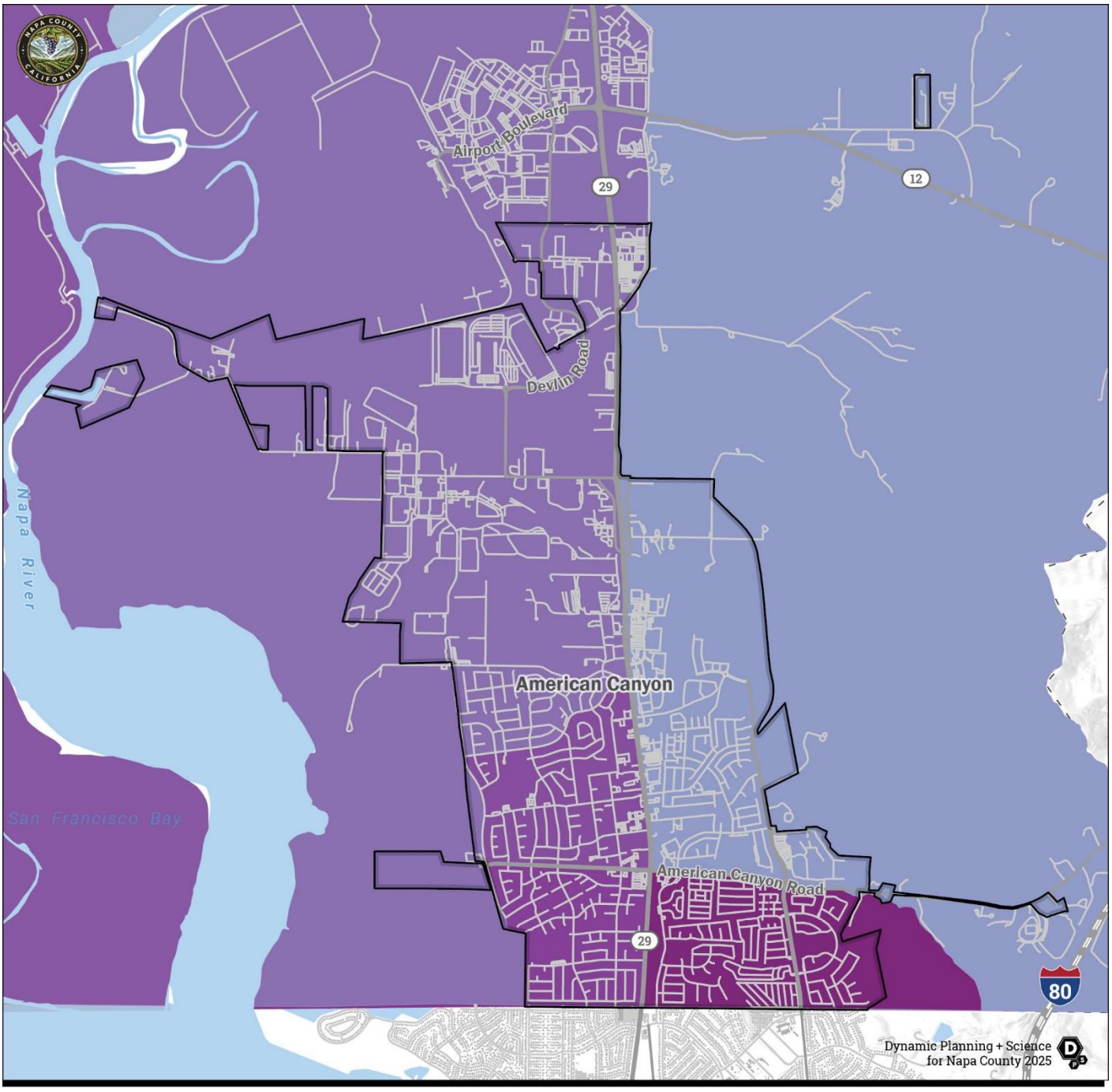


Figure 6-3: ACFPD Poverty Status Map



ACS Housing Occupancy

American Canyon Fire Protection District

*Data sources: ESRI Demographics Service, ACS.

Percent of Housing Units that are Owner-Occupied

> 88%

< 41%

No Value

Figure 6-4: ACFPD Housing Occupancy Map

6.2.2.2 Dependent & Disabled Populations

The distribution of dependent and disabled populations within ACFPD varies across the district and is an important factor in understanding community vulnerability to natural hazards. Analysis of American Community Survey (ACS) data shows distinct geographic patterns in the concentration of residents in dependent age groups, children and older adults, as well as elderly residents living with disabilities. These populations may require additional assistance before, during, and after emergency events, and their spatial distribution has direct implications for evacuation planning, emergency response, and recovery.

As shown in Figure 6-5, dependent age groups, including residents under 18 and adults over 65, are more concentrated in northern and eastern residential neighborhoods of the district. Areas with higher proportions of dependent populations often include family-oriented neighborhoods, multifamily housing, and established residential areas. During hazard events, children and older adults may face increased challenges related to evacuation, mobility, access to transportation, and reliance on caregivers or institutional support systems such as schools, childcare facilities, and senior services. Disruptions to these systems during emergencies can significantly increase stress on households and responders alike.

The ACS data and Figure 6-6 also indicate that certain areas of the district have elevated percentages of elderly residents aged 65 and older who are living with disabilities. These populations may be particularly vulnerable during disasters due to limited mobility, reliance on medical equipment, increased sensitivity to extreme temperatures, and the need for ongoing healthcare or in-home support services. Power outages, road closures, and delays in emergency access can pose serious risks to disabled elderly residents, even during relatively short-duration hazard events.

The overlap between higher concentrations of dependent populations and disabled elderly residents and other vulnerability factors, such as lower household incomes, higher renter occupancy, or proximity to hazard-prone areas, can compound risk within specific neighborhoods.

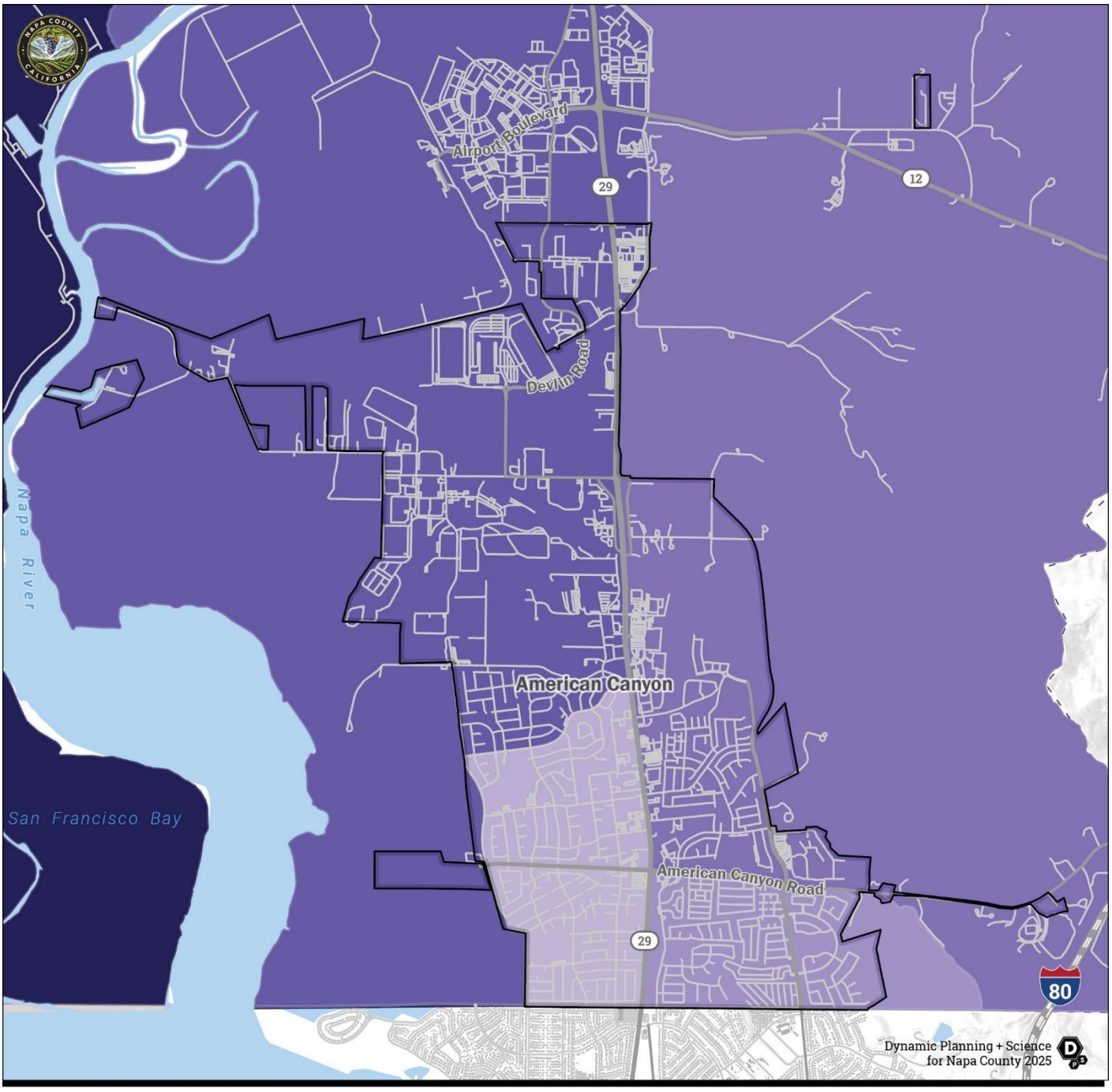


Figure 6-5: ACFPD Dependent Age Groups Map

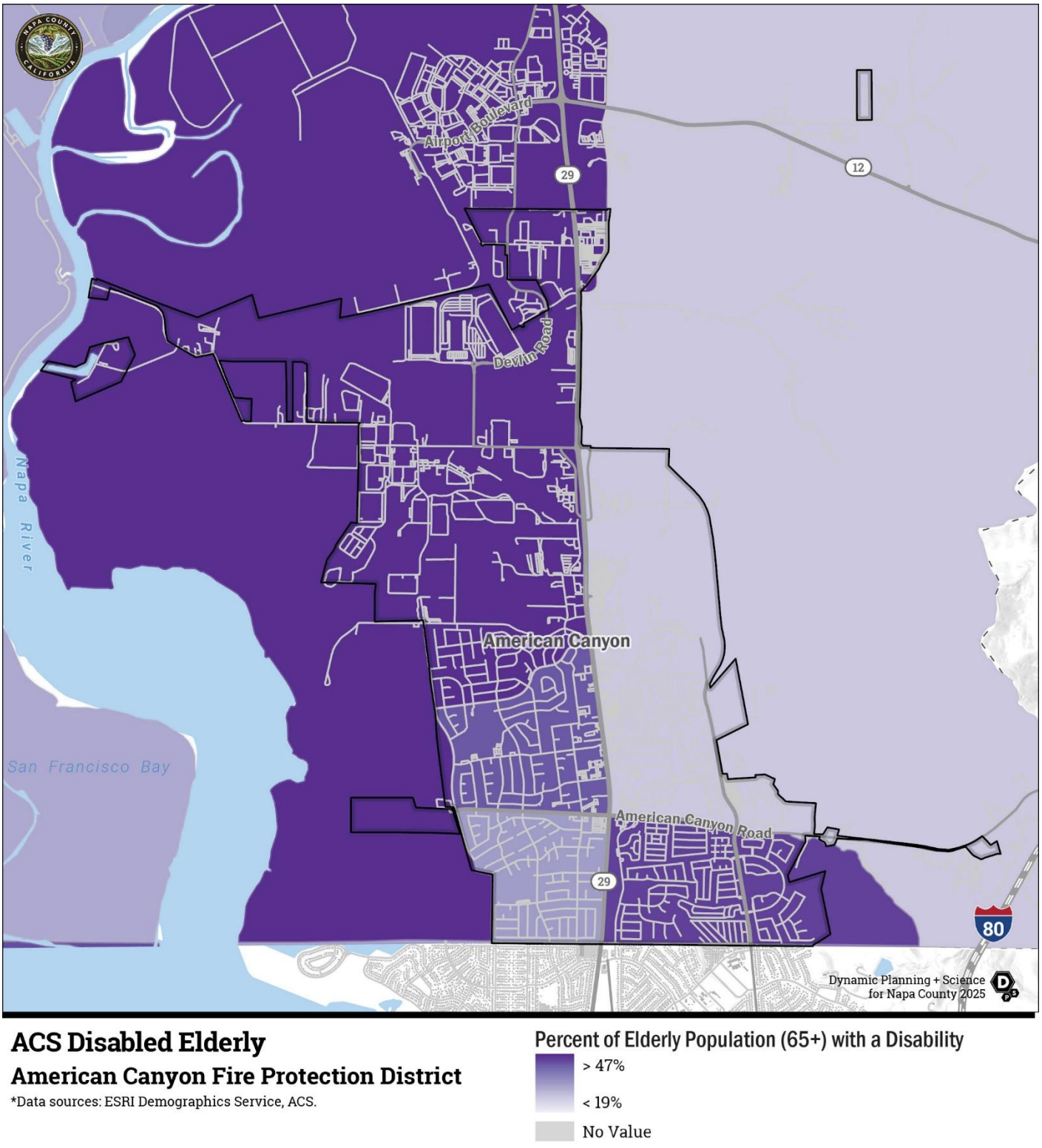


Figure 6-6: ACFPD Disabled Elderly Map

6.2.2.3 Race, Ethnicity & Language

Racial, ethnic, and linguistic characteristics within ACFPD vary across the district and are important considerations for understanding social vulnerability and effective emergency communication. ACS data shows clear geographic patterns in racial and ethnic predominance, as well as the prevalence of non-English languages spoken at home, reflecting the district's cultural diversity and settlement history.

The ACS race and ethnicity snapshot map, Figure 6-7, indicates that much of the district includes a mix of racial and ethnic groups, with Hispanic or Latino populations predominating in several central and southern residential areas. Other portions of the district show higher concentrations of residents identifying as White alone, not Hispanic or Latino, as well as areas with notable Asian populations, particularly in parts of the northern and northeastern areas. This spatial diversity highlights the presence of multiple cultural communities within the district, each of which may have different levels of access to resources, varying degrees of trust in public institutions, and distinct preferences in communication.

Language spoken at home further illustrates patterns relevant to emergency preparedness and response. Figure 6-8 shows that a substantial share of the population in many parts of the district speaks Spanish at home, with the highest concentrations occurring in central and southern neighborhoods. In these areas, a significant percentage of residents may have limited English proficiency, which can present barriers to receiving, understanding, and acting on emergency warnings, evacuation orders, and recovery information if communications are not provided in accessible and culturally appropriate formats.

The overlap between areas with higher proportions of Hispanic or Latino residents and higher rates of Spanish language use underscores the importance of multilingual emergency communication and outreach. During fast-moving hazard events such as wildfires or floods, delays or misunderstandings related to language barriers can increase risk to life and property. In addition, households where English is not the primary language may face challenges navigating disaster assistance programs, insurance processes, or recovery resources following an emergency.

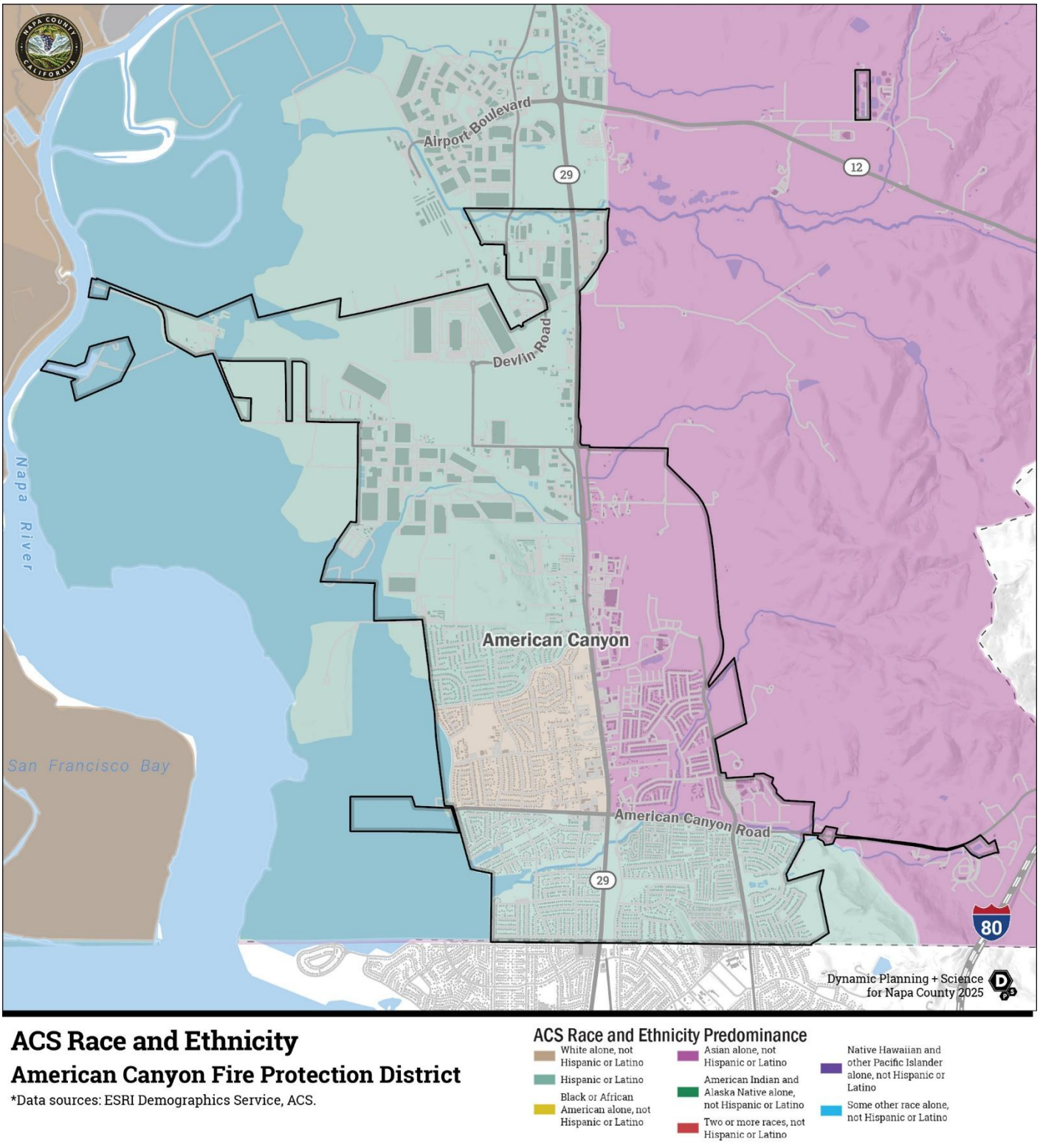
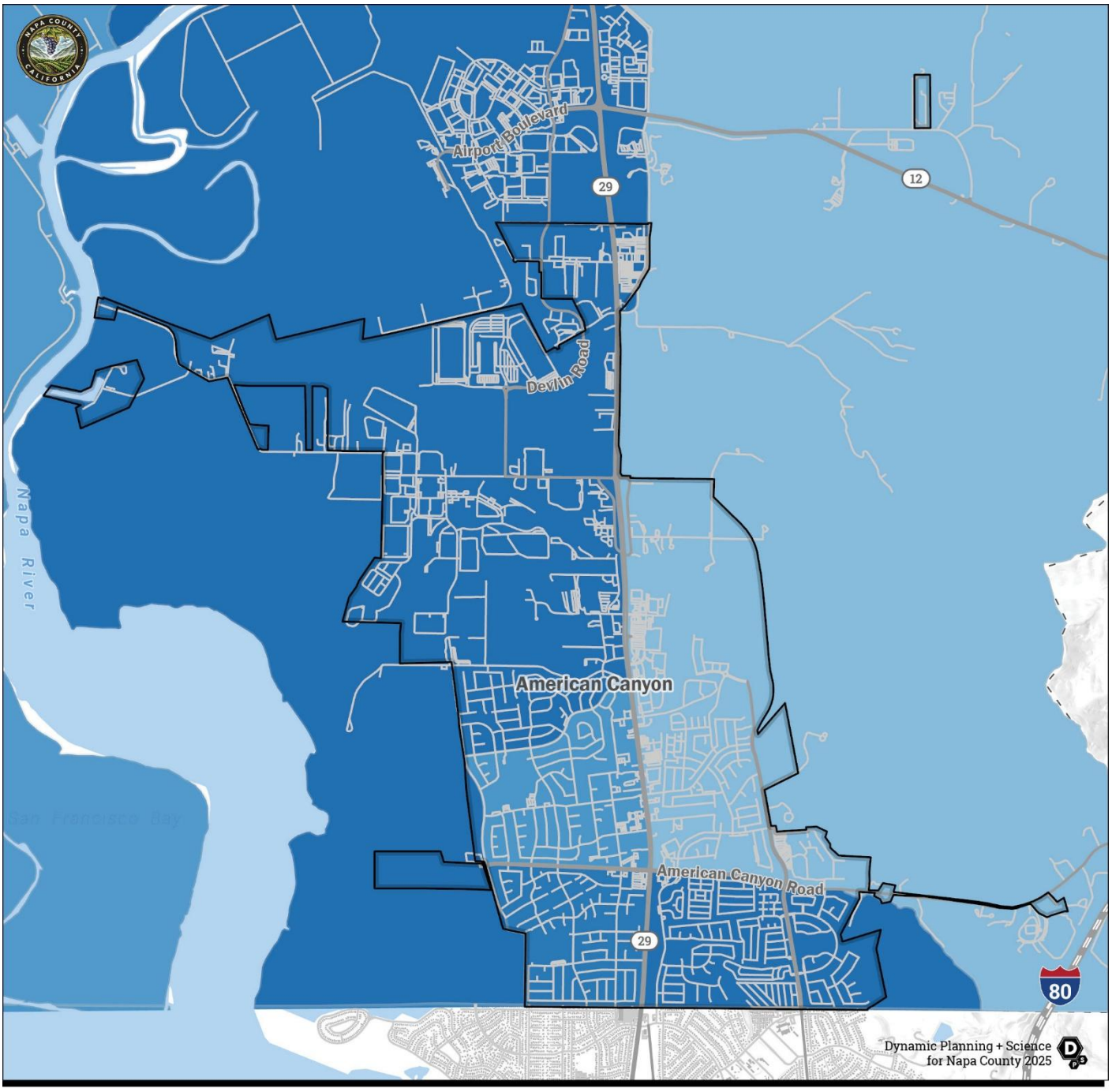


Figure 6-7: ACFPD Race and Ethnicity Map



ACS Language Spoken

American Canyon Fire Protection District

*Data sources: ESRI Demographics Service, ACS.

Percent of Population (5+) Who Speak Spanish at Home

> 33%

< 1%

No Value

Figure 6-8: ACFPD Spanish-Speaking Households Map

6.2.2.4 Social Vulnerability Index (SVI)

The Centers for Disease Control and Prevention (CDC) Social Vulnerability Index (SVI) for ACFPD reveals important spatial and demographic patterns that have direct implications for equitable hazard mitigation planning. As discussed in detail in Volume 1, Section 1.4.3.6, the SVI is a composite measure developed by the CDC to identify communities that are more likely to require support before, during, and after a disaster. It incorporates a range of factors across four key dimensions: socioeconomic status, household composition and disability, minority status and language, and housing type and transportation access. The resulting index score ranges from 0 (lowest vulnerability) to 1 (highest vulnerability).

Figure 6-9 shows lower SVI scores, indicating lower overall social vulnerability, are generally observed in eastern and southwestern portions of the district characterized by newer residential development, higher household incomes, and greater rates of owner-occupied housing. These areas typically have more resources available to prepare for hazards, respond to emergency warnings, and recover following disaster events. Residents in lower-vulnerability areas may also have greater access to transportation, insurance coverage, and social networks that support evacuation and post-disaster stability.

In contrast, moderate to higher SVI scores are concentrated in several central and southern portions of the district. These areas align with neighborhoods that also exhibit higher poverty rates, greater renter occupancy, higher proportions of dependent age groups, and increased prevalence of non-English language use. The convergence of these factors can increase sensitivity to hazard impacts and create barriers to timely evacuation, access to emergency information, and participation in recovery programs. Even when physical exposure to hazards is similar, socially vulnerable populations often experience disproportionate impacts due to limited resources and support systems.

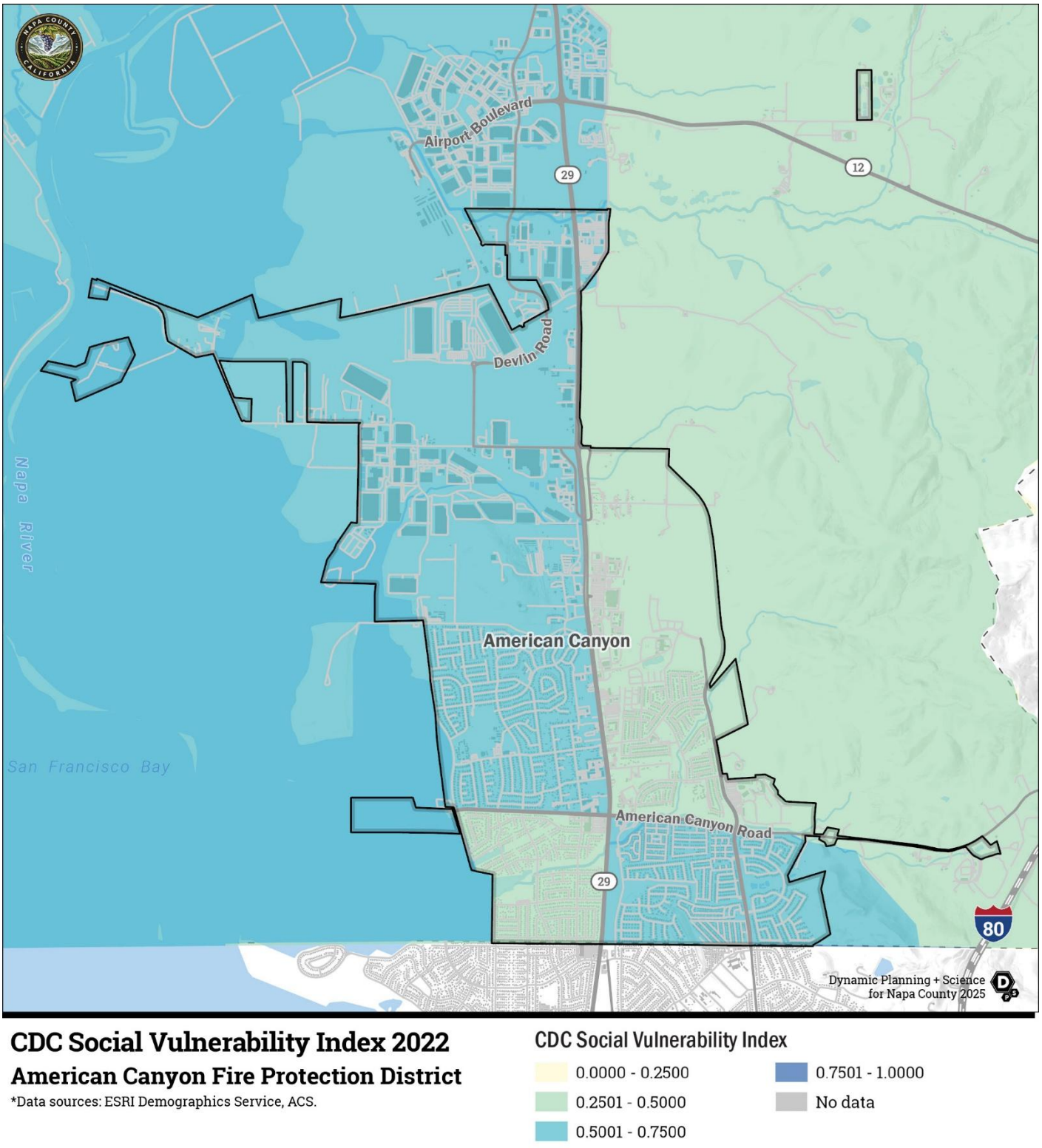


Figure 6-9: ACFPD CDC Social Vulnerability Index Map

6.2.3 Economy

The economy of ACFPD is closely tied to the broader economic structure of the City of American Canyon and southern Napa County, reflecting a mix of residential, commercial, industrial, and service-oriented land uses. The district serves a community that functions both as a local employment center and as a commuter population connected to regional job markets in Napa Valley, Vallejo, and the greater Bay Area.

Economic activity within the district includes light industrial and warehouse uses, logistics and distribution facilities, retail centers, hospitality services, and local professional and public-sector employment. Commercial and industrial areas located along major transportation corridors support employment opportunities while also introducing specific hazard considerations related to hazardous materials, transportation incidents, and continuity of operations during emergencies. These employment centers contribute to the district's daytime population and influence emergency response demand during business hours.

Residential development plays a significant role in the local economy, with many residents commuting outside the district for work in Napa, Solano County, and the greater Bay Area. Household income levels vary across the district, creating differences in economic resilience and recovery capacity following disasters. While higher-income households may be better positioned to absorb short-term disruptions, lower-income workers, particularly those employed in service, retail, or hourly wage sectors, may face greater economic hardship from business closures, evacuations, or infrastructure damage.

Public-sector institutions, schools, utilities, and healthcare-related services also represent important economic anchors within the district. Continuity of these services during hazard events is critical not only for life safety but also for maintaining economic stability and supporting post-disaster recovery. Disruptions to transportation networks, power, water, or communications systems could have cascading economic impacts affecting both residents and employers.

6.2.4 Growth Trends & Future Development

ACFPD has experienced steady population and development growth over the past decade, a trend that is expected to continue into the foreseeable future. American Canyon's strategic location at the southern end of Napa Valley, close to major transportation corridors such as State Route 29 and Interstate 80, has made it an attractive area for residential expansion, commercial investment, and industrial development. This growth reflects broader regional patterns, as households and employers seek more affordable land and proximity to both Napa and the Bay Area job markets.

Residential growth within the district has been driven largely by new subdivisions and infill development, particularly in the central and southern portions of the service area. These neighborhoods include a mix of single-family homes and multifamily housing, contributing to a diversifying housing stock and an increasing population base. Continued residential development is supported by local planning policies and market demand, and it is expected to expand further as remaining vacant parcels are developed. This

ongoing growth elevates demand for emergency services, fire prevention activities, infrastructure maintenance, and hazard mitigation planning.

Commercial and industrial development has also increased in recent years, with logistics, warehousing, light manufacturing, and service-oriented businesses locating near major roadways. The presence of these economic sectors contributes to local employment opportunities and broadens the district's economic base. However, industrial growth also brings new emergency management considerations, including hazardous materials handling, increased traffic volumes, and the need for specialized response capabilities.

Future development within the district is likely to focus on several key areas. First, continued residential infill and the build-out of remaining residentially zoned parcels will expand population density in established neighborhoods. Second, commercial revitalization along primary corridors aims to support local services, retail, and business growth that serve both residents and commuters. Third, industrial and logistics land uses are expected to continue playing a role in the local economy, especially given American Canyon's proximity to regional freight networks.

6.3 Planning Process

ACFPD followed the planning process detailed in Volume 1, Section 2, including participating in the county-wide Hazard Mitigation Planning Team (HMPT) and formulating their own internal planning team to support the broader planning process.

The district's representatives in the Steering Group led stakeholder and public engagement efforts alongside the Consultant Team, with assistance from the county-wide HMPT and their internal planning team. This engagement process is described in Volume 1. Specifically, for the district, this included postings to the district website and social media, and outreach events, as documented in Appendix B. Examples of Key Stakeholders engaged by Napa County on behalf of the district with relevance to the development of ACFPD's mitigation strategy include the USDA and other federal agencies; CAL FIRE and other state agencies; other jurisdictions; community-based organizations such as local Chamber of Commerce chapters; utility providers like PG&E; UC Davis and other academia; and local businesses.

All Key Stakeholders that were invited to participate in the planning process are listed in Volume 1, Section 2, and the input received from stakeholders was integrated into the district's annex, as described in Volume 1 Table 2-9. The district's internal planning team participants, their positions, and how they participated in the planning process are shown in Table 6-1.

Table 6-1: ACFPD Planning Team and Steering Group Members

Team Members	Title	Description of Involvement
Geoff Belyea	**Fire Chief**	**Lead Point-of-Contact, HMPT Kickoff, HMPT #1 thru #4, BO #1 and #2**
Cliff Campbell	Asst Fire Chief	Alternate Point-of-Contact, BO #1 and #2

ACFPD staff participated in a comprehensive hazard mitigation planning process as part of the 2026 Napa County MJHMP update. This included a series of breakout meetings, listed in Table 6-2 that engaged the district's planning team, which included key district personnel and stakeholders in evaluating hazards, identifying local vulnerabilities, and prioritizing mitigation strategies

The process began with a County-Wide Steering Group Kickoff Meeting on February 28, 2024. This initial meeting focused on welcoming participants, establishing a shared understanding of the project scope and schedule, clarifying roles and responsibilities of the Steering Group, the county-wide Hazard Mitigation Planning Team (HMPT), and individual jurisdictional planning teams, and included a review of key changes since the 2020 Local Hazard Mitigation Plan The meeting set the foundation for coordinated participation throughout the planning effort.

On December 10, 2025, participants engaged in a hexagon mapping activity designed to visually identify mitigation actions that could benefit from or require inter-jurisdictional coordination. These collaborative efforts helped shape a refined set of mitigation alternatives, establish shared planning goals, and align local strategies with FEMA's Hazard Mitigation Assistance (HMA) funding framework.

Throughout the series of breakout meetings, the district engaged in a structured and collaborative planning process focused on assessing hazard risks, identifying vulnerabilities, and developing targeted mitigation strategies. The meetings began with recaps of the county-wide HMPT meetings to ensure alignment of goals and progress.

During the August 14, 2024 breakout out meeting, discussions concentrated on community engagement outcomes, initial risk assessments, and the integration of demographic data to better understand vulnerable populations. Jurisdictional teams reviewed their specific hazard exposures using the Risk Assessment Mapping Platform (RAMP) and participated in prioritization exercises to identify their top hazards.

The June 22, 2025, breakout meeting shifted toward reviewing local capabilities and defining specific areas of concern, which informed the drafting of problem statements. Teams worked collaboratively to refine mitigation alternatives, align actions with FEMA guidelines, and develop a shortlist of priority mitigation actions and inter-jurisdictional collaboration opportunities.

The meetings also included consensus-building activities around hazard rankings, capabilities, and planned actions, while providing regular updates on the overall project schedule.

Table 6-2: ACFPD Planning Team Meetings

Meeting & Date	Agenda / Topics	Goals / Key Inputs
County-Wide Steering Group and HMPT Kick-off and Meetings #1 & #2 February 28, 2024– July 18, 2024		
ACFPD Planning Team Breakout Meeting #1 August 14, 2024	▪ County-wide HMPT meetings #1 and #2 recaps ▪ Community engagement progress and results ▪ Risk assessment and community vulnerability ▪ Demographics and vulnerable populations ▪ Overview of jurisdiction-specific hazard risks and exposure ▪ Introduction to Risk Assessment Mapping Platform (RAMP) ▪ Jurisdiction-specific hazard risk ranking exercise ▪ Project schedule updates and next steps	▪ Consensus on jurisdiction-specific priority hazards ▪ Identify capabilities and potential mitigation actions ▪ Community engagement volunteers
County-Wide HMPT Meeting #3 March 25, 2025		
ACFPD Planning Team Breakout Meeting #2 June 22, 2025	▪ Breakout Meeting #1 and HMPT #3 recaps ▪ Review capabilities assessment ▪ Review areas of concern and define problem statements ▪ Principles of effective mitigation strategies and actions, and mitigation alternatives ▪ Refine and align jurisdiction-specific mitigation actions exercise ▪ Project schedule updates and next steps	▪ Consensus on jurisdiction-specific capabilities ▪ Consensus on jurisdiction-specific areas of concern ▪ Consensus on priority mitigation actions and collaboration opportunities ▪ Community engagement volunteers
County-Wide HMPT Meeting #4 December 10, 2025		

6.3.1 Public Input & Draft Review

As detailed in Volume 1, Section 2, the draft plan was available for public review and comment from May 15 to June 2, 2026. Public comments received during that time were similar to those gathered throughout the public engagement process, including the need for more equity in the distribution of mitigation activities and funding and the need for enhanced cooperation among jurisdictions, utility providers, and state agencies. These comments were incorporated into the district's mitigation strategy, as appropriate; although, most were already addressed by the Mitigation Action Plan which was based on previous public input.

Public and stakeholder input was gathered and incorporated throughout the plan development process, before the public review period, such as from the online public survey (see Volume 1, Section 2.1.2 and Appendix B, for details). During the review period, jurisdictional staff and stakeholders that participated in the plan development also reviewed the public draft and provided comments on minor corrections and revisions, which were addressed in the final plan.

6.4 What's New

This section provides an overview of hazard mitigation planning efforts for the planning area and highlights the updates made in the 2026 MJHMP. This is the first time ACFPD has participated in the MJHMP process. While not included in the 2020 plan, the district has since strengthened its focus on resilience through key efforts. Through this MJHMP process, ACFPD has identified its highest-priority hazards, developed hazard-specific problem statements, and proposed actionable mitigation strategies.

By aligning with countywide partners and leveraging regional resources, ACFPD has strengthened its capacity to prepare for, withstand, and recover from disasters while continuing to protect its unique coastal community character.

6.4.1 Mitigation Activities

Mitigation activities within ACFPD focus on reducing the long-term risk to life, property, and critical infrastructure from natural and human-caused hazards. These activities are implemented through a combination of fire prevention programs, land use coordination, infrastructure improvements, public education, and operational planning, and are aligned with local, county, state, and federal hazard mitigation objectives. ACFPD's mitigation approach emphasizes proactive risk reduction, integration with development decisions, and equitable protection of vulnerable populations.

A central component of the district's mitigation strategy is fire prevention and code enforcement. ACFPD enforces applicable California Fire Code and local amendments to ensure new development and existing buildings incorporate fire-resistive construction, adequate access, water supply, and defensible space where required. Plan review and inspection activities help reduce structural fire risk, support wildfire resilience at the wildland–urban interface and ensure that commercial and industrial facilities manage hazardous materials appropriately.

Vegetation management and wildfire risk reduction are also key mitigation priorities. ACFPD supports defensible space requirements, fuel reduction practices, and coordination with property owners and partner agencies to reduce wildfire intensity and improve firefighter access. These efforts are particularly important along the eastern hillsides and transitional areas between developed neighborhoods and open space. Ongoing vegetation management helps mitigate wildfire spread, protects evacuation routes, and reduces exposure to smoke and ember intrusion during wildfire events.

Flood risk reduction and stormwater management activities contribute to mitigation by addressing hazards associated with the Napa River, tidal influences from San Pablo Bay, and localized drainage systems. While primary responsibility for flood control infrastructure lies with other agencies, ACFPD coordinates with the City of American Canyon and Napa County to ensure emergency access, response planning, and public awareness in flood-prone areas. Protection of critical facilities, roadways, and utilities from flooding is essential to maintaining emergency response capabilities during major storm events.

Public education and outreach are integral to ACFPD's mitigation efforts. The district participates in community risk reduction programs that promote household preparedness, evacuation planning, smoke alarm installation, and fire-safe behaviors. Outreach efforts are increasingly tailored to reach renters, non-English-speaking households, seniors, and other vulnerable populations identified through demographic and Social Vulnerability Index analysis. Effective communication before disasters improves compliance with evacuation orders and reduces injuries and losses during emergencies.

Operational planning and interagency coordination further support mitigation goals by strengthening response readiness and continuity of operations. ACFPD collaborates with the City of American Canyon, Napa County, law enforcement, public works, utilities, and neighboring fire agencies to plan for large-scale emergencies. Joint training, mutual aid agreements, and participation in countywide planning initiatives help reduce response time, improve situational awareness, and limit cascading impacts during hazard events.

6.4.2 Mitigation Successes

Vegetation Management

In September 2023, ACFPD, in partnership with Napa County Fire, the City of American Canyon, and the Napa Communities Firewise Foundation, implemented a sheep grazing program as a natural vegetation management strategy. The program utilizes sheep from a local producer to reduce dry grasses and other flammable vegetation in targeted areas, supporting wildfire risk reduction while aligning with the city's sustainability and environmental stewardship goals.

Sheep grazing provides an effective alternative to conventional vegetation management methods that rely on chemical herbicides or heavy machinery. The approach improves soil health through natural fertilization, enhances biodiversity, and allows for quiet, non-disruptive treatment of areas that may be difficult to access with equipment. By reducing fuel loads, the program helps create a more fire-resistant

landscape and improves visibility in parks, vacant lots, and public spaces, contributing to both wildfire mitigation and community safety.

The grazing program also represents a cost-effective and environmentally responsible mitigation measure. By lowering long-term vegetation management costs, the city is able to allocate resources more efficiently while advancing public safety, climate resilience, and ecological health. This initiative demonstrates American Canyon's commitment to innovative, sustainable hazard mitigation practices that reduce wildfire risk and support overall community resilience.

In addition, ACFPD, in partnership with Napa Firewise, the City of American Canyon, Napa County, and Napa Pasture Protein, is implementing targeted sheep grazing to reduce wildfire risk in high-hazard areas throughout American Canyon (Figure 6-10). The program focuses on creating defensible space and fuel breaks in community buffer zones and open space preserves, including challenging terrain such as the Newell Open Space Preserve where traditional vegetation management methods are difficult to implement. Grazing provides a low-impact, environmentally sustainable alternative to mechanical clearing or herbicide use, supporting biodiversity, native landscapes, and soil health while reducing fine fuels. When combined with individual property defensible space efforts, these grazing activities help protect entire neighborhoods. To date, hundreds of acres across American Canyon have been treated through this approach, contributing to long-term wildfire mitigation and community resilience.



Figure 6-10: ACFPD Targeted Sheep Grazing

Grant Funding

ACFPD has demonstrated strong fiscal responsibility and operational leadership by securing grant funding to enhance emergency response capabilities while minimizing financial impacts on the community. Through multiple competitive grants, the district obtained approximately $177,000 to purchase critical equipment, including a shallow-bottom rescue boat for water rescue operations along the Napa River, nine sets of structural firefighting personal protective equipment, and two complete sets of battery-operated extrication tools ("Jaws of Life"). These investments improve firefighter safety, strengthen rescue capabilities, and increase operational efficiency across a range of emergency scenarios.

In addition to equipment upgrades, the district has made significant progress in workforce development and organizational capacity. Targeted training and staff development initiatives resulted in multiple internal promotions, including four firefighters promoted to Fire Captain and two Fire Captains advanced to Battalion Chief. The district also enhanced staffing levels through successful firefighter/paramedic recruitment, hiring three new personnel to strengthen emergency medical response. Continued integration of new technologies has further improved communication systems, data-driven decision-making, and overall emergency response effectiveness. Collectively, these accomplishments support the district's mission, improve community safety, and enhance long-term resilience.



Figure 6-11: Extrication Tools Purchased from Grant

ACFPD also received a grant from the California Fire Foundation to support ongoing wildfire prevention and preparedness efforts in response to increasingly year-round wildfire risk. The grant funding was used to purchase wildland personal protective equipment (PPE), enhancing firefighter safety during wildfire response operations. The California Fire Foundation provides statewide grant support to fire departments and community organizations for wildfire education, planning, equipment, fuels reduction, and community safety initiatives. This investment strengthens the district's ability to safely and effectively respond to wildfires while supporting broader community resilience and preparedness efforts in American Canyon.

6.5 Risk Assessment

This section focuses on profiling hazards specific to ACFPD and assessing their vulnerability independent of the broader county-wide planning area, which has been evaluated in Section 3 of Volume 1. The hazard profiles in Volume 1 discuss overall impacts to the planning area and describe relevant plans, policies, and regulations; past events; location; frequency and probability of future occurrences; severity and extent; warning time; secondary hazards; and climate change impacts. For more information on risk assessment methodologies, see Volume 1, Appendix A.

This section includes a tailored vulnerability assessment, analyzing assets at risk such as population, property, and critical facilities and infrastructure unique to the district, and information on district-specific differences in hazard vulnerability across the planning area. It also identifies total district assets at risk, including people, property, and critical facilities and infrastructure within the district. In addition, this section presents growth and development trends for the community, offering insights into vulnerabilities and risks that represent the broader context of assets at risk.

6.5.1 Hazard Screening & Prioritization

Members of the Planning Team from each participating jurisdiction came together to collaboratively decide which county-wide hazards would be included in the MJHMP, and which would be excluded. Hazard screening and prioritization took place early in the process and integrated historic data, local knowledge, and consensus opinions to create a risk assessment matrix for the county as well as for each participating jurisdiction. These matrices indicate the priority of hazards prior to further refinement. Details about this process, the results of the discussion, and in-depth profiles for county-wide hazards can be found in Volume 1, Sections 2 and 3.

ACFPD's internal planning group used the same hazard identification and prioritization process as the county-wide Planning Team. They reviewed previously prepared hazard mitigation plans and other relevant documents to determine the realm of natural hazards that have the potential to affect the district. Table 6-3 provides a crosswalk of hazards identified in select planning documents, including the 2020 Napa County MJHMP, 2022 ACFPD Long Range Master Plan, 2022 Climate Change Adaptation Plan and the 2023 State of California HMP. The crosswalk was used to develop a preliminary hazards list, providing a framework for the group to evaluate which hazards were truly relevant to ACFPD and which ones were not.

The internal planning group then ranked hazards based on their probability of affecting ACFPD and potential impacts on the community. Figure 6-12 displays the results of the hazard risk ranking exercise that was performed before further refinement. All hazards have been profiled in Volume 1 of this document. The purpose of this annex is to specifically address the district's vulnerability to specifically identified hazards.

Table 6-3: ACFPD Document Review of Potential Hazards

Hazard	2020 Napa County MJHMP	2022 ACFPD Long Range Master Plan	2023 California SHMP
Agricultural Pests	■		■
Avalanche			■
Climate Change	■		■
Coastal			■
Dam Failure	■	■	■
Drought	■	■	■
Earthquake / Liquefaction	■	■	■
Extreme Cold			■
Extreme Heat			■
Extreme Weather / Storms	■	■	■
Flood	■	■	■
Geologic / Mass Movement	■	■	■
Human-Caused			■
Insects			■
Levee Failure			■
Pandemic Disease	■		■
Sea Level Rise			■
Soil			■
Subsidence			■
Tornado			■
Tsunami / Seiche Wave			■
Volcano			■
Wildfire	■	■	■

Risk Assessment Matrix Definitions

PROBABILITY RATING

The likelihood of a hazard event occurring within a time period?

PROBABILITY

- **Highly Likely** - 100% annual probability. Or Likely to occur every year in your lifetime.
- **Likely** - between 10 & 100% annual probability. Or will occur several times in your lifetime.
- **Possible** - between 1 & 10% annual probability. Or Likely to occur some time in your lifetime.
- **Unlikely** - less than 1% annual probability. Or unlikely but possible to occur in your lifetime.

IMPACT RATING

In terms of injuries, damage, or death, would you anticipate impacts to be minor, limited, critical, or catastrophic when a significant hazard event occurs? The impact could be in terms of one hazard event (flooding from a culvert failure) or a large-scale event (multiple rivers flooding) in the same jurisdictional boundary.

IMPACT

Minor	Limited	Critical	Catastrophic

Minor - very few injuries, if any. Only minor property damage & minimal disruption on quality of life. Temporary shutdown of critical facilities.

Limited - minor injuries only. Approx. 10% or less of property in disaster footprint damaged or destroyed. Complete shutdown of critical facilities for more than one day.

Critical - multiple deaths/injuries possible. Between 25% and 50% of property in disaster footprint is damaged or destroyed. Complete shutdown of critical facilities for more than one week.

Catastrophic - high number of deaths/injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for 30 days or more.

To concentrate resources, the jurisdictional planning team will focus on "High" and "Extreme" risk hazards, and "Medium" risk hazards to a lesser extent. These hazards have the higher probability and greater impact as it relates to the jurisdictions planning area.

Hazard definitions are included in **Vol. 1** of this plan. Some hazards are discussed as subset hazards— e.g., "Levee Failure" within the "Flood" hazard profile. If a hazard is not present on the risk matrix, is grey, or categorized as a "Low" risk hazard, the jurisdictional planning team felt the hazard had a minimal footprint or impact within their planning area and chose not to profile the hazard.

Hazard Information / Legend:



Climate Change impacts will be addressed within each relevant hazard section within the plan update and as a stand alone section for each jurisdiction. Climate change may change the frequency, duration, or intensity of other hazards profiled.

American Canyon FPD Risk Matrix

IMPACT

PROBABILITY	Minor	Limited	Critical	Catastrophic
Highly Likely	Medium	SEVERE WEATHER	Extreme	EARTHQUAKE
Likely	WILDFIRE	High	High	Extreme
Possible	Low	Medium	High	High
Unlikely	Low	Low	Medium	Medium

Figure 6-12: ACFPD Risk Assessment Matrix

Note: Hazard naming in the Risk Assessment Matrix may not match the final naming used. Refer to hazards prioritization summary table.

Priority Hazards

The results of the initial risk ranking exercise completed by the district's Planning Team, before further refinement, are identified in the county's completed matrix in Figure 6-12. Table 6-4 provides the final list of priority hazards and subhazards with additional details about why certain hazards were chosen and why others were not prioritized. However, it should be noted that many hazards not prioritized for profiling are briefly discussed as secondary or compounding hazards, and subhazards that were profiled and included in the risk assessment are listed specifically.

Table 6-4: ACFPD Hazards Prioritization Summary

Hazard	Priority	Explanation
Earthquake / Liquefaction	**Extreme**	**Profiled in Volume 1, Section 3.3.4, and Section 6.5.2.2 in this annex** (not including Liquefaction due to low probability and impact potential)
Wildfire	**Medium**	**Profiled in Volume 1, Section 3.3.1, and Section 6.5.2.1 in this annex**
Flood	-	Profiled in Volume 1, Section 3.3.2; not a priority due to low probability and impact potential
Levee Failure	-	Profiled in Volume 1, Section 3.3.2; not a priority due to low probability and impact potential
Extreme Weather / Storms	**High**	**Profiled in Volume 1, Section 3.3.5, and Section 6.5.2.3 in this annex as Severe Weather, including High Wind and Heavy Rain** (Winter Weather not a priority due to low probability and impact potential)
Drought	-	Profiled in Volume 1, Section 3.3.6; not a priority due to being outside jurisdictional mission and authority
Geologic / Mass Movement	-	Profiled in Volume 1, Section 3.3.5; not a priority due to low probability and impact potential
Extreme Heat	-	Profiled in Volume 1, Section 3.3.8; not a priority due to being outside jurisdictional mission and authority
Agricultural Pests	-	Profiled in Volume 1, Section 3.3.9; not a priority due to being outside jurisdictional mission and authority
Sea Level Rise	-	Profiled in Volume 1, Section 3.3.9; not a priority due to low probability and impact potential
Climate Change	**Medium**	**Profiled in Volume 1, Section 3.3.9, and Section 6.5.2.4 in this annex and discussed as a compounding hazard in relevant profiles**
Dam Failure	-	Profiled in Volume 1, Section 3.3.3; not a priority due to being outside jurisdictional mission and authority

6.5.2 Vulnerability to Specific Hazards

Assessing vulnerabilities exposes the unique characteristics of individual hazards and begins the process of narrowing down which areas within the district are vulnerable to specific hazard events. The vulnerability assessment considered unique local knowledge of hazards and impacts and a GIS overlaying method for examining such vulnerabilities in more depth. Using these methods, the district's planning group estimated vulnerable populations, properties, and assets, and potential losses. In addition, the exposure of district assets to drought, earthquake, wildfire, flood, and climate change hazards were also considered.

Many of the hazard profiles include a snapshot map and damage estimation tables that illustrate the district's vulnerabilities to those specific hazards. These maps assisted the planning group in understanding the hazard exposure of populations, parcels, and critical facilities and infrastructure. Each snapshot map contains an exposure summary that displays the percentage of the population, the improvement and content value of parcels, and the amount of critical infrastructure that is exposed. For hazards without geospatial extents, such as drought and severe weather, narratives are provided instead of exposure maps and tables.

Based on the hazard prioritization exercise, this vulnerability assessment focuses on four hazards for the ACFPD, some of which encompass sub hazards such as Liquefaction and Heavy Rain.

Wildfire
SECTION 6.5.2.1



Earthquake
SECTION 6.5.2.2



Severe Weather
SECTION 6.5.2.3



Climate Change
SECTION 6.5.2.4



6.5.2.1 Wildfire Hazard

Wildfire represents a persistent and evolving hazard for the ACFPD, shaped by the district's location at the interface between urban development, open space preserves, and regional wildland areas. Although much of American Canyon consists of developed residential and commercial land uses, the surrounding hillsides, grasslands, and natural areas create conditions where wildfire ignition and spread remain credible risks. Seasonal drought, elevated temperatures, wind events, and increasingly variable precipitation patterns further contribute to wildfire potential, consistent with broader trends observed throughout California (CAL FIRE; California Climate Assessment).

Figure 6-13 illustrates that moderate to high wildfire hazard areas are primarily concentrated along the district's eastern and northeastern boundaries, where developed neighborhoods transition into open space and upland terrain. These areas are characterized by natural vegetation, steeper slopes, and fuel continuity that can support fire growth under conducive weather conditions. Open space preserves, including areas with documented fire history, present unique mitigation challenges due to terrain, access limitations, and ecological considerations. While these landscapes provide important environmental and recreational benefits, they also represent potential wildfire pathways affecting adjacent residential communities.

Importantly, the exposure summary associated with the snapshot indicates that no population, parcels, or critical infrastructure assets are currently mapped within the highest wildfire risk zones. This reflects the fact that the most severe hazard classifications are generally located outside the district's primary developed footprint. However, this condition does not eliminate wildfire risk. Fires originating outside jurisdictional boundaries, or within moderate and high hazard areas, may still threaten structures, evacuation routes, utility systems, and air quality. Ember intrusion, smoke impacts, and rapid fire spread driven by wind conditions can affect developed areas even when ignition occurs remotely.

Wildfire risk within the ACFPD is influenced not only by hazard location but also by development patterns and vegetation characteristics. Residential neighborhoods located near open space areas may experience heightened exposure due to proximity to unmanaged fuels, ornamental vegetation, and potential evacuation constraints. Transportation corridors and utility infrastructure can also be vulnerable to wildfire-related disruptions, creating cascading impacts affecting emergency response and community function.

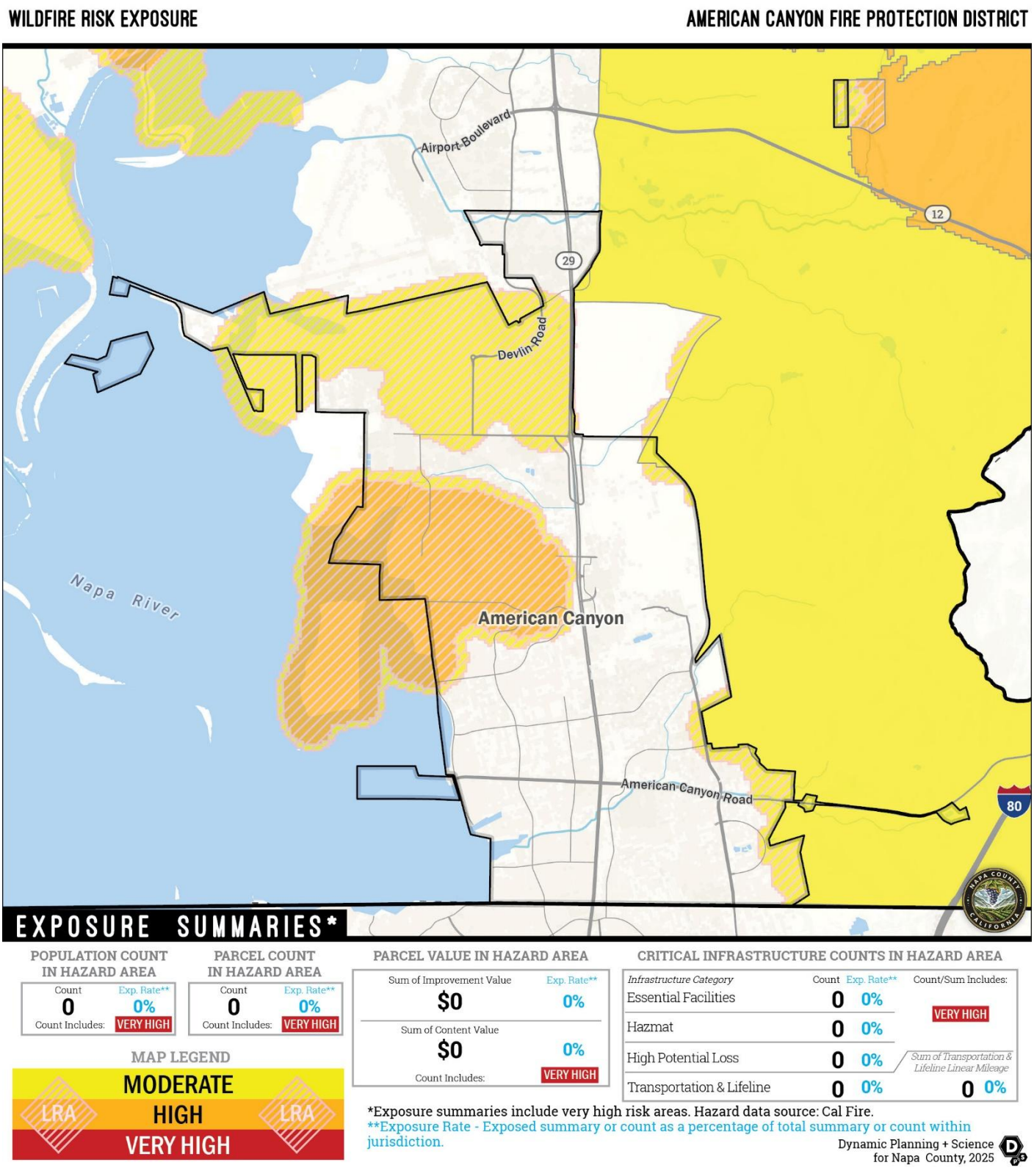


Figure 6-13: Exposure Summary – ACFPD Wildfire Risk

6.5.2.2 Earthquake Hazard

Earthquakes represent a significant natural hazard for the ACFPD, consistent with the district's location within the seismically active San Francisco Bay Area and proximity to several major fault systems. Regional seismic sources, including the West Napa Fault, Rodgers Creek Fault, Hayward Fault, and broader North Bay fault network, present credible earthquake scenarios capable of generating strong to severe ground shaking within the district. Historical seismic events, most notably the 2014 South Napa Earthquake, underscore the region's ongoing exposure to earthquake risk.

The earthquake scenario maps illustrate the range of potential shaking intensities affecting the district under different seismic events. In Figure 6-14, The Hunting Creek – Berryessa Earthquake Scenario (M7.1) indicates limited exposure within the district, with only a small number of residents and parcels modeled within severe shaking intensity zones. This reflects the relative distance of the scenario epicenter from the district and the attenuation of shaking effects across the region.

In contrast, the West Napa Earthquake Scenario (M6.7), Figure 6-15 demonstrates substantially greater consequences for the ACFPD. Under this scenario, the entire district is subject to strong to very strong shaking intensities (Modified Mercalli Intensity VII–VIII). Exposure analysis indicates that approximately 21,800 residents, representing essentially 100 percent of the district's population, would experience significant ground shaking. Similarly, all mapped parcels and the full assessed structural value, exceeding $7.4 billion in improvement value, fall within the modeled shaking impact area. Two critical infrastructure facilities are also identified within the affected zone.

Strong earthquake shaking presents a wide range of hazards and secondary impacts. Structural damage to residential, commercial, and industrial buildings may occur, particularly in older structures or facilities not designed to modern seismic standards. Nonstructural hazards, including falling debris, utility disruptions, hazardous materials releases, and roadway damage, can significantly affect life safety and emergency response operations. Transportation networks may experience reduced capacity due to bridge damage, surface failures, or debris blockage, complicating emergency access and evacuation.

In addition to direct shaking impacts, earthquakes may generate cascading hazards relevant to ACFPD operations. These include fire following earthquake, water system failures, communications disruptions, and increased demand for rescue and medical response. Soft soils and alluvial deposits present in portions of the district may amplify shaking effects or contribute to localized ground failure, including settlement or lateral spreading.

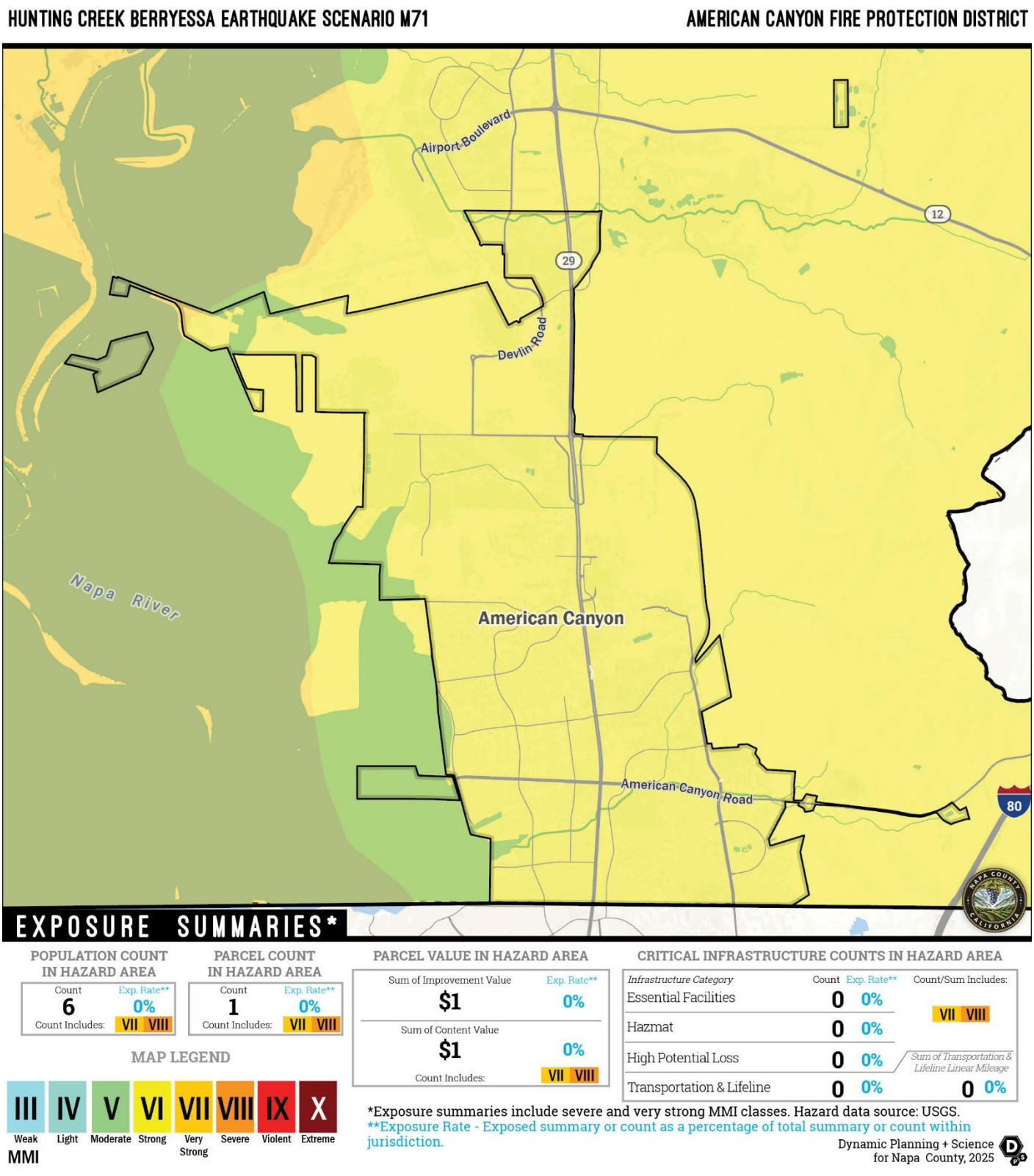


Figure 6-14: Exposure Summary – ACFPD Earthquake Risk (M7.1 Hunting Creek–Berryessa)

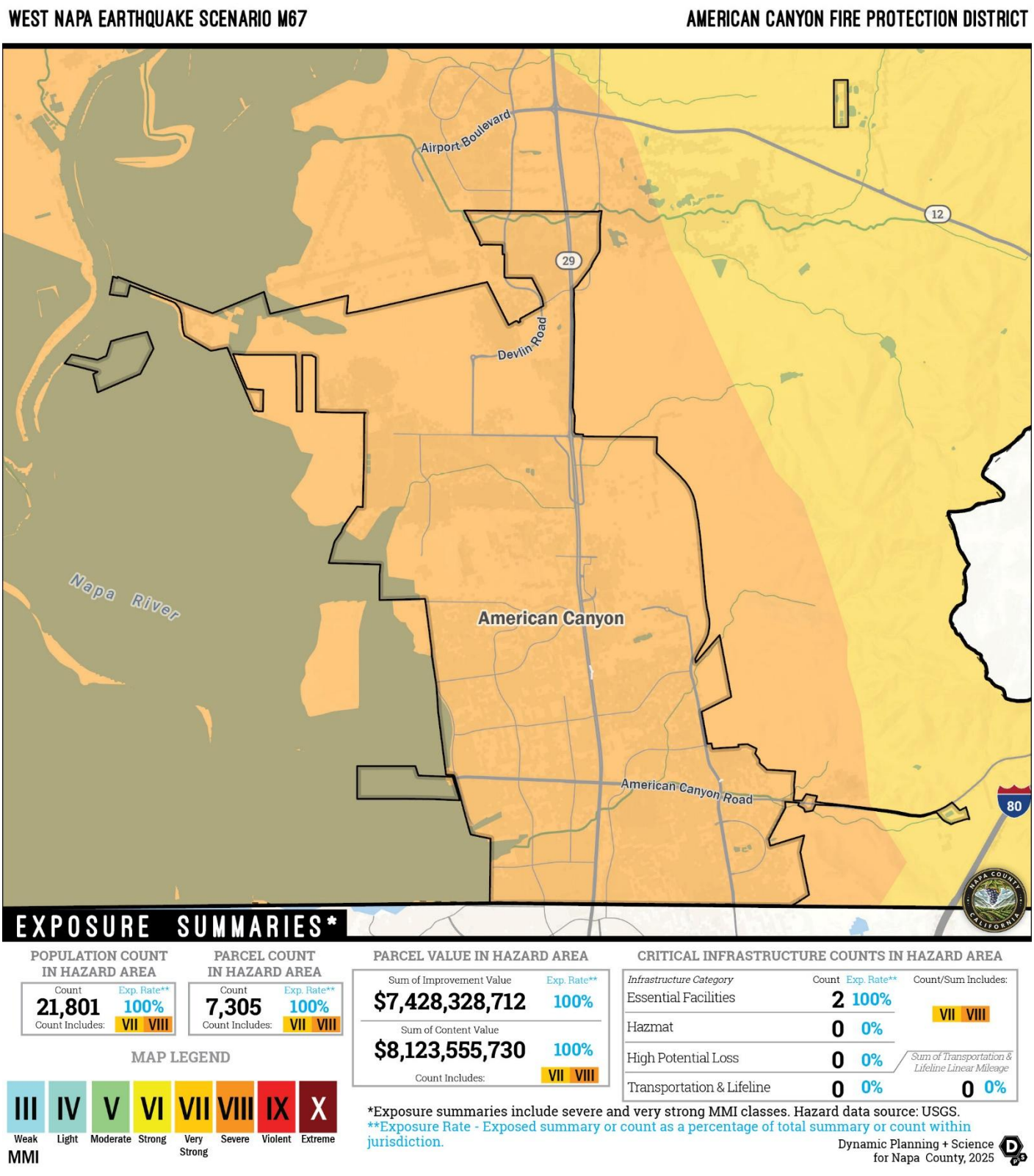


Figure 6-15: Exposure Summary – ACFPD Earthquake Risk (M6.7 West Napa)

6.5.2.3 Severe Weather Hazard

Severe weather hazards affecting the ACFPD primarily include heavy rainfall events and strong winds from severe storm systems. While the region very rarely experiences hazards such as tornadoes or blizzards, localized severe weather conditions can produce significant public safety, infrastructure, and emergency response impacts.

Heavy Rainfall & Storm Events

Although drought conditions are common, California increasingly experiences episodic, high-intensity rainfall events. Atmospheric river systems can deliver large volumes of precipitation over short durations, contributing to urban flooding, roadway impacts, and localized drainage failures.

Within ACFPD, heavy rainfall events may lead to localized street and low-lying area flooding, stormwater system overload, Increased vehicle collisions, debris flows and erosion, impacts to access routes and emergency response times. Heavy precipitation following wildfire events can further elevate risk by destabilizing soils and increasing runoff rates.

Thunderstorms, while less frequent than in other regions, may produce lightning, brief heavy rainfall, and localized wind impacts. Lightning poses both ignition risk and potential impacts to power systems. Severe storm systems may also generate hazardous driving conditions and localized infrastructure disruptions.

High Wind

Strong winds are a critical severe weather factor due to their relationship with wildfire ignition and spread. Wind-driven fire behavior significantly increases suppression difficulty, rate of spread, and ember cast distances (CAL FIRE). Even outside wildfire contexts, high wind events may result in downed trees and powerlines, traffic hazards, structural damage, and increased power outage likelihood. Wind events combined with dry conditions represent a particularly high-risk scenario for the district.

Severe weather hazards within the ACFPD frequently generate secondary and cascading impacts rather than isolated catastrophic events. Extreme heat, heavy rainfall, and strong wind conditions can collectively contribute to increased demand for emergency medical services and rescue operations, particularly during periods of prolonged heat exposure or hazardous travel conditions. Severe weather may also disrupt transportation networks through localized flooding, debris, reduced visibility, or roadway obstructions, which can in turn affect evacuation, emergency response times, and daily mobility.

In addition, severe weather events are commonly associated with power outages resulting from infrastructure strain, wind damage, or PSPS measures. These outages can produce broader operational and community consequences, including interruptions to critical facilities, communication challenges, and increased reliance on emergency services. Weather-related stress on infrastructure systems, including power, drainage, and transportation assets, may further compound risks during extreme events. Importantly, certain severe weather conditions, particularly high temperatures, low humidity, and strong winds, can significantly elevate wildfire potential, intensifying both ignition risk and fire behavior.

Public health impacts also represent a key cascading concern, as severe weather conditions may exacerbate heat-related illness, respiratory issues, injury risk, and other medical emergencies. Climate projections indicate that variability and intensity of weather patterns are expected to increase across California, amplifying both temperature extremes and episodic high-intensity precipitation events. These trends suggest that severe weather hazards may increasingly influence emergency response demands, infrastructure performance, and overall community resilience within the district.

6.5.2.4 Climate Change Hazard

Average annual temperatures across most of California have already increased by more than 1°F, with some areas experiencing rises of over 2°F when comparing the 1901–1960 average to that of 1986–2016. Daily maximum temperatures, a key indicator of extreme heat, are projected to increase by 4.4°F to 5.8°F by 2050 and by 5.6°F to 8.8°F by 2100. Heat waves that impact public health, known as heat-health events, are also expected to intensify across the state. By 2050, these events are projected to last up to two weeks longer in the Central Valley and occur four to ten times more often in the Northern Sierra region (California Natural Resources Agency, 2022).

California is already experiencing significant impacts from climate change, including prolonged drought, a lengthened wildfire season, increased coastal flooding and erosion, and widespread tree mortality. The state has observed rising average temperatures, more extreme heat days, fewer cold nights, a longer growing season, and shifts in the water cycle, with less winter precipitation falling as snow. In addition, summertime fog has declined by approximately 33%, and both snowmelt and rainwater runoff are occurring earlier in the year (Cal OES, 2018).

Long-term trends indicate a 12% to 20% decline in fog across California from 1900 through projections to 2070. Climate experts suggest that warming temperatures reduce the ability of air masses to cool enough to produce fog, which plays a critical role in supporting California's ecosystems (Grantham, Teodore; University of California, Berkeley, 2018).

Climate change is expected to influence both the frequency and severity of natural hazards affecting the ACFPD. As part of the San Francisco Bay Area, the district is subject to climate-driven shifts in temperature, precipitation patterns, drought cycles, and extreme weather variability. These changes are not considered stand-alone hazards but rather risk multipliers that can intensify existing threats and alter hazard behavior over time.

Climate projections for California indicate continued increases in average temperatures, more frequent and prolonged heat events, reduced snowpack statewide, greater precipitation variability, and an increased likelihood of both severe drought and episodic high-intensity rainfall events. Rising temperatures directly contribute to elevated wildfire risk by drying vegetation, extending fire seasons, and increasing fuel aridity. Even in areas not traditionally considered wildfire-prone, hotter and drier conditions may heighten ignition potential and fire intensity.

Hydrologic impacts associated with climate change may also affect flood behavior. While overall precipitation totals may fluctuate, storms are projected to become more concentrated and intense, increasing the probability of short-duration, high-impact rainfall events. These conditions can overwhelm drainage systems, increase localized flooding, accelerate erosion, and elevate slope instability. At the same time, longer dry periods between storms may further degrade soil stability and vegetation cover, compounding runoff and landslide susceptibility when heavy rainfall does occur.

Drought conditions are similarly expected to intensify under future climate scenarios. Extended dry periods can stress vegetation, reduce water availability, increase tree mortality, and elevate wildfire fuel loads. Drought may also place strain on regional water supply systems, indirectly affecting fire suppression capacity and emergency response operations.

Extreme heat represents another key climate-sensitive concern. Increasing temperatures may drive higher rates of heat-related illness, particularly among vulnerable populations, while also placing additional demand on emergency medical services. Heat can further impact infrastructure systems, including power reliability, transportation surfaces, and mechanical equipment performance.

Importantly, climate change introduces greater uncertainty into hazard planning. Historical patterns may become less reliable predictors of future conditions, requiring adaptive mitigation strategies, flexible emergency planning, and continued monitoring of emerging risk trends. For ACFPD, climate change underscores the need to integrate long-term resilience considerations into wildfire mitigation, flood management, emergency response planning, infrastructure protection, and community preparedness efforts.

Sea Level Rise

Sea level rise represents a long-term, climate-driven hazard with important implications for the ACFPD. Due to the district's proximity to the Napa River, San Pablo Bay, and tidally influenced wetlands, rising sea levels have the potential to influence flood behavior, groundwater conditions, infrastructure performance, and emergency response operations over time. Unlike acute hazards, sea level rise is a gradual process that primarily functions as a hazard multiplier by exacerbating existing flood-related risks.

Exposure analysis derived from NOAA sea level rise modeling provides important context for understanding the scale of potential impacts within the district. Figure 6-16 indicates that approximately 96 residents and 4 parcels are located within areas potentially affected by projected sea level rise scenarios. The associated improvement value exposure totals approximately $3.87 million, with a total parcel value exposure of approximately $3.01 million. While these values represent a relatively small percentage of the district's overall population and development footprint, they highlight that localized exposure exists, particularly in low-lying areas adjacent to tidally influenced waterways and shoreline zones.

Projected increases in sea levels within the San Francisco Bay Area are expected to contribute to more frequent nuisance flooding, expanded floodplain boundaries, and increased backwater effects. Even modest increases in baseline water levels can significantly increase the extent and depth of flooding during storm

events, particularly when combined with king tides and heavy precipitation. As a result, areas currently experiencing limited or infrequent flooding may face increased flood recurrence over time.

Sea level rise may also contribute to secondary physical effects, including shoreline erosion, wetland migration, and rising groundwater tables. Elevated groundwater conditions can increase the potential for localized flooding, soil saturation, and infrastructure impacts, even outside traditionally mapped flood hazard areas. These processes can gradually alter site conditions, affecting roads, utilities, and structural foundations.

From an operational perspective, sea level rise presents several planning considerations for ACFPD. Increased flood frequency and duration may influence emergency access routes, evacuation patterns, and infrastructure reliability. Repetitive or chronic flooding may also affect building performance and long-term community resilience. Although current exposure levels appear limited, future development patterns, changing flood dynamics, and evolving climate conditions may alter risk profiles over time.

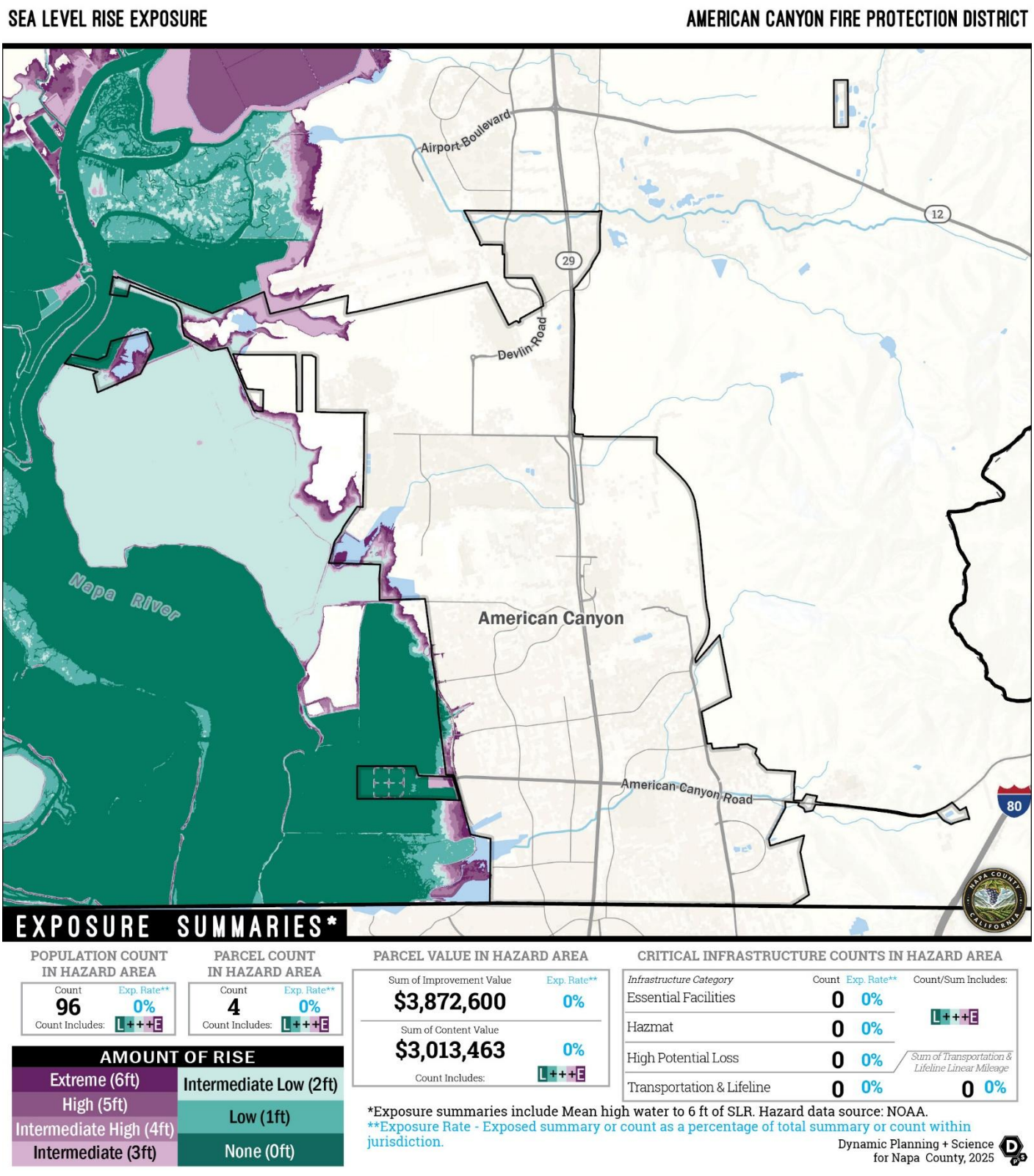


Figure 6-16: Exposure Summary – ACFPD Sea Level Rise

6.5.3 Climate Change Impacts & Vulnerable Populations

Climate change introduces risk factors that do not affect all community members equally. Within the ACFPD, shifts in temperature, precipitation patterns, and hazard frequency have implications that are closely tied to social, economic, and demographic conditions. Understanding how climate-related hazards intersect with vulnerable populations is essential for effective mitigation, preparedness, and emergency response planning.

Projected climate conditions for California indicate increasing average temperatures, more frequent and intense heat events, greater variability in precipitation, and heightened potential for both drought and extreme storm events. These changes influence multiple hazards already present within ACFPD, including wildfire, flooding, severe weather, and public health emergencies. While the physical hazards may affect broad geographic areas, the severity of impacts often varies based on population characteristics.

Extreme heat represents one of the most significant climate-related threats to vulnerable populations. Older adults, individuals with disabilities, young children, and those with underlying health conditions are particularly sensitive to heat stress. Heat-related illness risks increase for populations with limited access to air conditioning, medically dependent individuals, and those experiencing economic constraints. Lower-income households may face barriers related to cooling costs, housing quality, or access to safe refuge during prolonged heat events. These conditions can translate into increased EMS demand and elevated life safety risks.

Climate change also influences wildfire conditions through rising temperatures, extended dry seasons, and altered vegetation patterns. Vulnerable populations may face disproportionate impacts during wildfire events due to evacuation challenges, mobility limitations, or reduced access to transportation. Individuals with disabilities, elderly residents, and households without reliable vehicles may require additional assistance during rapid-onset incidents. Smoke exposure further compounds health risks, particularly for populations with respiratory conditions, children, and older adults.

Flooding and severe storm events introduce a different set of vulnerabilities. Residents in lower-lying areas, multifamily housing, or older structures may experience higher exposure to flood-related damages. Renters and lower-income households often have limited financial capacity to recover from property damage or temporary displacement. Language barriers may also influence access to warnings, preparedness information, and recovery resources, particularly during fast-moving events requiring immediate protective action.

Economic vulnerability plays a critical role in climate resilience. Households with limited financial resources may face challenges preparing for hazards, maintaining insurance coverage, or absorbing post-disaster losses. Recovery timelines frequently vary based on income, employment stability, and housing tenure. These disparities are well-documented in disaster research and are expected to become more pronounced as climate-related hazards intensify.

Dependent populations, including children and elderly residents, introduce additional planning considerations. Schools, care facilities, and medically dependent individuals may require specialized emergency procedures during extreme weather, smoke events, or power outages. Disruptions to utilities or transportation systems can disproportionately affect individuals reliant on medical equipment, public transit, or caregiver networks.

Language and communication factors further shape vulnerability. Households with limited English proficiency may encounter barriers accessing warnings, evacuation instructions, and hazard preparedness guidance. Effective risk communication increasingly requires multilingual outreach, culturally appropriate messaging, and diversified alerting strategies.

Importantly, vulnerability is not solely defined by demographic categories but by the interaction between hazard exposure, sensitivity, and adaptive capacity. Many residents may fall into multiple vulnerability dimensions simultaneously, such as elderly individuals living alone, lower-income households with dependent children, or individuals with disabilities residing in hazard-prone areas.

6.5.4 Hazard Problem Statements

As part of the mitigation action identification process, the Planning Committee for each jurisdiction identified areas of concern (aka problem statements) for their respective facilities based on the risk assessment and vulnerability analysis, utilizing the RAMP mapping and static snapshot maps. Problem statements focused on the impact, victim, or threat that the hazard could create in the jurisdiction, as described in Table 6-5. Identifying common issues and weaknesses through these problem statements assisted the planning group in understanding the realm of resources needed for mitigation.

The goal is to have at least one mitigation action for every problem statement. Projects or actions have been developed to mitigate each problem identified. See Table 6-7 for a full list of mitigation actions and corresponding problem statements that they address. Each problem statement is coded with a problem number for cross-referencing between Table 6-5 and Table 6-7

Table 6-5: ACFPD Hazard Problem Statements

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-EQ-ACFPD-001	Earthquake	Impact	**American Canyon Fire Protection District**	The district lies within shaking zones for West Napa Fault events (M6.7 scenario), which could damage older structures, disrupt communications, and reduce operational readiness.	ma-AH-ACFPD-001, ma-EQ-ACFPD-002
ps-EQ-ACFPD-002	Earthquake	Threat	**American Canyon Fire Protection District**	Station 211's undersized and outdated design makes it vulnerable to seismic damage, impacting continuity of operations. Deficiencies in apparatus bay size and lack of modern construction features.	ma-EQ-ACFPD-001

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-EQ-ACFPD-003	Earthquake	Impact	**American Canyon Fire Protection District**	Earthquake damage to transportation networks (Highway 29 corridor, James Rd area) could slow emergency response and limit mutual-aid access.	ma-AH-ACFPD-001, ma-EQ-ACFPD-002
ps-EQ-ACFPD-004	Earthquake	Victim	**American Canyon Fire Protection District**	Limited administrative staffing and absence of Battalion Chief coverage on every shift reduce the district's ability to manage incident command complexity during a major seismic event.	ma-AH-ACFPD-001, ma-AH-ACFPD-002
ps-EW-ACFPD-001	Extreme Weather	Impact	**American Canyon Fire Protection District**	Severe wind events have caused operational disruptions, toppled trees, and damaged utility lines in American Canyon, posing risks to emergency response routes and delaying resource deployment. Frequent weather-related service interruptions.	ma-SW-ACFPD-002, ma-SW-ACFPD-001
ps-EW-ACFPD-002	Extreme Weather	Impact	**American Canyon Fire Protection District**	Heavy rainfall and atmospheric river events can overwhelm stormwater systems in the city, limiting apparatus mobility and increasing response times.	ma-SW-ACFPD-002, ma-SW-ACFPD-001
ps-EW-ACFPD-003	Extreme Weather	Victim	**American Canyon Fire Protection District**	ACFPD lacks a fully developed severe-weather response protocol, increasing vulnerability during high-impact storms and wind events.	ma-SW-ACFPD-001, ma-AH-ACFPD-002
ps-WF-ACFPD-001	Wildfire	Threat	**American Canyon Fire Protection District**	Eucalyptus stands along Commerce Blvd create elevated fire hazard potential and ember-cast risk near residential subdivisions and critical facilities, including adult care homes.	ma-WF-ACFPD-001, ma-WF-ACFPD-002, ma-WF-ACFPD-003
ps-WF-ACFPD-002	Wildfire	Victim	**American Canyon Fire Protection District**	Adult and childcare facilities located near vegetated greenbelts are at increased risk due to limited mobility of residents and staffing constraints for evacuation.	ma-WF-ACFPD-001, ma-WF-ACFPD-002, ma-WF-ACFPD-003
ps-WF-ACFPD-003	Wildfire	Impact	**American Canyon Fire Protection District**	Prevailing winds can carry smoke and embers into populated areas, impacting air quality and triggering medical aid demand spikes, which align with ACFPD's heavy EMS workload	ma-WF-ACFPD-003
ps-WF-ACFPD-004	Wildfire	Threat	**American Canyon Fire Protection District**	Limited staffing (0.992 firefighters per 1,000 population vs. national avg. 1.54) and resources reduces surge capacity for wildfire response during multi-alarm incidents.	ma-AH-ACFPD-001, ma-AH-ACFPD-002, ma-WF-ACFPD-002, ma-WF-ACFPD-003

6.6 Mitigation Strategy

This section provides the framework for how ACFPD will reduce hazard risk within its jurisdiction while supporting the broader goals of the Napa County MJHMP. It includes an overview of existing capabilities, opportunities to strengthen resilience, and the district's prioritized mitigation actions. Together, these elements demonstrate how ACFPD integrates hazard awareness into its planning and development processes while contributing to a coordinated countywide approach.

Within the Napa County MJHMP, the mitigation strategy serves as the roadmap for future hazard mitigation efforts. For ACFPD, the strategy outlined in this annex reflects the outcomes of the countywide planning process while also addressing the district's unique risks, priorities, and community needs. The strategy is designed to reduce vulnerabilities identified in the risk assessment, including the problem statements developed for wildfire, earthquakes and severe weather, and climate change.

Mitigation actions identified in this annex include both policy-based and project-based initiatives, with an emphasis on integrating resilience into land use planning, infrastructure investments, and community programs. Actions are structured to align with FEMA's requirements and to coordinate with existing district, county, and regional planning mechanisms. Each action identifies responsible parties, potential funding sources, and the resources needed for implementation.

For ACFPD, this strategy provides a framework for strengthening resilience by combining district-led initiatives, such as infrastructure improvements, and community preparedness, with regional coordination through the MJHMP. By advancing these efforts in alignment with the Master Plan and other local planning documents, ACFPD enhances its ability to reduce hazard risk while supporting long-term community safety, sustainability, and economic stability.

The subsections that follow describe these elements in detail:

- **Sections 6.6.1, Capabilities and Opportunities,** provides a summary of the city's capacity to address natural hazards.
- **Section 6.6.2, Mitigation Action Plan,** presents the district's prioritized actions to guide implementation in coordination with countywide strategies.

Aligning the Action Plan

This section connects ACFPD's mitigation actions with its existing capabilities and areas for growth. Capability assessments are a required element of hazard mitigation planning under the Disaster Mitigation Act of 2000 and FEMA's 2023 guidance, ensuring that actions are realistic, achievable, and aligned with available resources.

The section begins with a summary of ACFPD's capabilities across four areas: planning and regulatory, administrative and technical, fiscal, and education and outreach. This overview highlights the tools and strengths that the district already uses to reduce hazard risk. The section then provides a detailed analysis of each capability area, identifying both current practices and opportunities to expand resilience.

6.6.1 Capabilities & Opportunities

This section provides a detailed assessment of the district's current capabilities to support hazard mitigation, as well as future opportunities. This consists of describing how the city is planning for hazards and growth and a summary of its existing capabilities and the potential for enhancement.

6.6.1.1 Planning for Hazards & Growth

ACFPD operates within a dynamic environment shaped by continued development, regional population growth, and evolving hazard conditions. Effective hazard mitigation planning requires the district to balance current operational demands with long-term community expansion, infrastructure changes, and emerging climate-driven risks. As American Canyon continues to develop, land use decisions, construction patterns, and infrastructure investments play a central role in shaping both hazard exposure and emergency response needs.

Growth within the District has historically been associated with residential expansion, commercial development, and the buildout of previously undeveloped areas. New development can strengthen community resilience through modern building codes, ignition-resistant construction, improved water supply systems, and enhanced roadway networks. At the same time, growth can introduce new vulnerabilities by expanding the built environment into areas subject to wildfire, flooding, slope instability, or other hazards. The district's planning framework must therefore recognize that development simultaneously reduces and redistributes risk.

Hazard-informed planning is a key mechanism for managing this balance. Integration of hazard data into land use planning, development review, and capital improvement programming allows ACFPD and partner agencies to proactively address risk. This includes consideration of wildfire severity zones. Early incorporation of hazard mitigation principles into project design can reduce future losses, minimize emergency response challenges, and limit long-term operational strain on district resources.

From an emergency services perspective, growth directly influences service demand, response times, and infrastructure requirements. Increased population density, expanded residential neighborhoods, and new commercial centers generate additional calls for service while also affecting travel patterns, evacuation dynamics, and water supply distribution. Fire station siting, apparatus deployment, and staffing models must evolve alongside development patterns to maintain consistent levels of service.

Infrastructure planning is equally critical. Transportation corridors, bridges, utilities, and water systems form the backbone of both hazard resilience and emergency response capability. Growth-related infrastructure improvements can enhance redundancy and system reliability; however, hazard exposure such as flooding, seismic events, or wildfire can disrupt these networks. Coordinated planning helps ensure that infrastructure investments support both community development and hazard mitigation objectives.

Climate change further complicates the relationship between hazards and growth. Shifting temperature patterns, altered precipitation regimes, increased wildfire conditions, and sea level rise introduce

uncertainty into long-term planning assumptions. Areas previously considered low-risk may experience changing hazard profiles over time, reinforcing the need for adaptive planning approaches.

ACFPD's role within this planning landscape is inherently collaborative. While land use authority resides primarily with the City of American Canyon, the district contributes through development review, fire code enforcement, defensible space programs, emergency response planning, and public safety coordination. Participation in regional hazard mitigation efforts, interagency planning initiatives, and capital improvement discussions allows the district to integrate hazard considerations into broader community decisions.

6.6.1.2 Development & Hazard Considerations

Development patterns within the ACFPD play a central role in shaping hazard exposure, emergency response demands, and long-term community resilience. As American Canyon continues to grow, the interaction between land use decisions and natural hazards becomes increasingly important. New development influences not only where risk exists, but also how that risk is managed through design, construction standards, infrastructure investment, and emergency planning.

American Canyon's geographic setting creates a complex hazard environment. The district encompasses low-lying bayfront areas, established urban neighborhoods, transportation corridors, and hillside or wildland interface zones. Each of these environments presents distinct hazard considerations. Expansion into wildland-adjacent areas can increase wildfire exposure, while development within low-lying or coastal areas may elevate flood and sea level rise vulnerability. Similarly, construction near slopes or areas of weak soil introduces potential concerns related to slope instability or seismic ground failure.

Modern development, however, also presents significant opportunities to reduce risk. California's building and fire codes require ignition-resistant construction, defensible space measures, fire flow provisions, and seismic design standards that substantially improve structural performance compared to older building stock. New subdivisions typically incorporate improved roadway widths, hydrant spacing, water supply infrastructure, and emergency access features that enhance response capability and evacuation efficiency.

Despite these advances, development can redistribute rather than eliminate hazard exposure. Increased density elevates potential consequences when events occur. Concentrated populations, expanded infrastructure networks, and greater asset values increase the scale of potential losses associated with earthquakes, flooding, wildfire, or severe weather events. Growth also influences evacuation complexity, traffic congestion, and emergency resource allocation during large-scale incidents.

Wildfire considerations are particularly relevant at the edges of developed areas. As residential and commercial growth approaches open space or vegetated lands, the WUI becomes a key planning focus. Fuel management, defensible space enforcement, ignition-resistant construction, and emergency access design are essential components of risk reduction. Strategic buffers, vegetation management programs, and landscape design standards can significantly reduce structure ignition potential.

Flood and stormwater hazards present a different but equally important challenge. Development alters drainage patterns, increases impervious surfaces, and can intensify localized flooding if not carefully managed. Stormwater systems, detention facilities, and grading design must account for both current conditions and projected climate variability. Sea level rise introduces an added dimension for low-lying areas, requiring long-term planning for drainage, infrastructure elevation, and potential future inundation scenarios.

From an emergency services perspective, growth directly affects operational capacity. Increased development expands the district's service area, modifies travel demand, and alters response time dynamics. Fire station coverage, apparatus deployment, staffing models, and water supply distribution must evolve alongside development patterns. Infrastructure investments that support redundancy, circulation efficiency, and system reliability enhance both hazard resilience and emergency response effectiveness.

ACFPD's involvement in development is primarily exercised through fire code enforcement, development review, water supply and access requirements, defensible space programs, and interagency coordination. Early integration of hazard mitigation principles into project design represents one of the most effective risk reduction strategies. Addressing hazards at the planning stage is consistently more cost-effective than retrofitting or post-disaster recovery.

6.6.1.3 Capabilities & Opportunities Assessment

To develop a realistic and actionable mitigation strategy, it must account for existing jurisdictional capabilities and what future opportunities there are to enhance those capabilities for purposes of hazard mitigation. This section provides an assessment of the district's existing capabilities and future opportunities, including planning and regulatory, administrative and technical, fiscal, and public outreach and education capabilities. This assessment also identifies opportunities to integrate this MJHMP into future planning, policies, or programs to weave mitigation efforts into daily operations and address hazard problems wholistically. Capabilities are categorized into four groups and include various mechanisms.

- **Planning and Regulatory Capabilities:** Existing long-range plans, emergency response plans, hazard-specific plans, land use policies, and building and development standards.
- **Administrative and Technical Capabilities:** Available expertise in emergency services, engineering, grant management, and community planning.
- **Fiscal Capabilities:** Budgetary capacity, taxing authority, grants, and other funding mechanisms that can support mitigation projects.
- **Outreach and Education Capabilities:** Existing programs for providing technical assistance, community education, public warnings, and stakeholder engagement.

A full description of the process used to develop the capabilities assessment is provided in Volume 1, Section 2.3.3.

This capabilities and opportunities assessment for ACFPD lists the various types of capabilities along with how they have been, currently are, or will in the future be integrated into hazard mitigation planning efforts.

The three "HMP Integration" columns that identify the capability's status and usage are color-coded with green, yellow, or orange shading to communicate the following:

- **Status:** If the capability is present at all and what level of use it has generally.
- **Current Mitigation Use:** If the capability is currently being used in mitigation efforts, specifically, and at what level.
- **Future Opportunity:** If there is a future opportunity to integrate the capability into mitigation efforts and at what level.

Summary of Capabilities & Opportunities

This Capabilities and Opportunities Assessment for ACFPD summarizes the various types of capabilities it has for hazard mitigation currently. The assessment also identifies opportunities to integrate, expand, and improve the city's capabilities for future hazard mitigation. Table 6-6 provides a comprehensive list of capabilities and identifies the current status, current mitigation use, and future opportunities.

Planning & Regulatory

ACFPD's planning and regulatory capabilities include strong operational practices, particularly in fire prevention, inspections, defensible space enforcement, weed abatement, public education, and code enforcement. The city's adoption of CAL FIRE Fire Hazard Severity Zone maps and Chapter 7A ignition-resistant construction standards further strengthens the regulatory framework for wildfire risk reduction.

Several planning areas remain informal or are handled through partner agencies. ACFPD does not currently maintain a formal Capital Improvements Program, Annual Fire Prevention Plan, non-structural seismic safety program, Earthquake Modernization Plan, Floodplain Response Plan, Drought Management Plan, or independent Community Wildfire Protection Plan. The District's Master Plan identifies several of these gaps and recommends greater formalization, especially for capital planning and fire prevention activities.

Stormwater, floodplain, groundwater, climate adaptation, and drought planning are primarily managed by the city, County, or regional agencies. However, ACFPD supports hazard resilience through emergency response, participation in the Napa County CWPP, engagement with Napa Firewise programs, and ongoing public education. Opportunities exist to strengthen resilience by developing structured planning documents, formalizing hazard-specific outreach, and better integrating wildfire, seismic, flood, heat, and drought preparedness into District programs.

Future integration of the MJHMP will occur through various processes and mechanisms outlined across multiple mitigation actions (Table 6-7). Key opportunities for future hazard mitigation integration with the ACFPD's existing planning mechanisms include incorporating the updated risk assessment, hazard-specific vulnerability findings, and projected climate change impacts into the Severe Weather Response Protocol Development (ma-SW-ACFPD-001), Storm Access Route Reliability Mapping (ma-SW-ACFPD-002), Wildfire Evacuation Support & Access Reliability (ma-WF-ACFPD-002), and the Wildfire Public Information & Smoke Impact Program (ma-WF-ACFPD-003).

Administrative & Technical

ACFPD's administrative and technical capacity reflects the structure of a small to mid-sized fire district that prioritizes core emergency response operations while relying on partner agencies or shared resources for specialized functions. The district maintains strong operational capability but does not have dedicated internal staff for several technical and administrative roles.

ACFPD does not employ a dedicated Emergency Manager, civil engineer, GIS specialist, Public Information Officer, outreach specialist, or grant manager. Emergency management functions are primarily handled by the City of American Canyon and Napa County OES, while engineering, infrastructure, drainage, roadway, and GIS support are provided through City and County resources. Public outreach is conducted through reserve personnel and shared City support.

Although this structure is consistent with ACFPD's operational mission, it may limit internal capacity for hazard mitigation planning, sustained public education, multilingual risk communication, detailed vulnerability analysis, and competitive grant pursuit. Opportunities exist to strengthen resilience by expanding shared staffing support, formalizing administrative roles, and improving grant coordination for mitigation, equipment, and long-term resilience projects.

Warning Systems & Services

ACFPD relies on regional, county, and city-operated warning systems for public notification and emergency communication. The District does not independently operate hazard-specific alert systems but coordinates with the City of American Canyon, Napa County, and regional partners to support consistent emergency messaging.

General emergency notifications are provided through systems such as Everbridge, Nixle, social media, and shared public communication channels. Flood alerts are managed by the City of American Canyon and the Napa County Flood Control and Water Conservation District, while ACFPD responds operationally to flood incidents.

Wildfire warning and evacuation communication are supported through regional tools such as Zonehaven and Everbridge. Although ACFPD plays a key role in wildfire response, evacuation alerts and public warnings are typically coordinated through law enforcement and emergency management agencies. Geological hazard alerts, including earthquake and landslide notifications, are managed through state, federal, and regional systems such as ShakeAlert, with ACFPD focused on response and public safety operations after an event.

Fiscal

ACFPD's fiscal capabilities support core operations, capital improvements, and some hazard mitigation activities through voter-approved revenues and development-related fees. The district benefits from a voter-approved Fire Service Fee, as well as development impact fees that help fund growth-related facility,

apparatus, and equipment needs. The 2023 Development Impact Fee Study further strengthened this capacity by establishing a Fire Capital Facilities Fee for new development.

ACFPD does not generate utility service fees or stormwater-related revenues, as those functions fall outside the district's authority and are managed by the City of American Canyon or Napa County. The district has not issued general obligation bonds, but it has explored other financing tools, such as Community Facilities District or Mello-Roos mechanisms, that could support future large-scale infrastructure or facility investments.

Capital improvements are currently funded primarily through Fire Service Fee revenues and development impact fees rather than a formal Capital Improvements Program. While this provides flexibility, the lack of a structured CIP and formal risk-based spending policies may limit long-term planning for hazard mitigation, facility modernization, and infrastructure resilience.

Education & Outreach

ACFPD's education and outreach capabilities include established community engagement practices, social media communication, public safety messaging, and partnerships that support wildfire preparedness, emergency awareness, and life safety risk reduction. The District maintains an online and social media presence, while also relying on the City of American Canyon and regional partners such as Napa Firewise to share broader hazard education and preparedness information.

ACFPD participates in annual public safety events, including National Night Out, fire station open houses, school visits, and similar outreach activities. These events provide opportunities to educate residents on fire safety, defensible space, emergency preparedness, and hazard awareness. The District also responds to public inquiries through informal channels such as phone calls, station visits, and direct staff interaction.

While outreach is active, several functions are not yet formalized. ACFPD does not currently maintain a comprehensive hazard education platform, routine public safety newsletter, structured technical assistance program, or formal distribution strategy for printed hazard materials at public-facing facilities. Opportunities exist to strengthen outreach by expanding hazard-specific web content, improving printed material distribution, formalizing technical assistance, and continuing collaboration with Napa Firewise, Fire Safe Councils, the Resource Conservation District, and reserve personnel.

ASSESSMENT LEGEND

HMP Integration

Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Table 6-6: ACFPD Capabilities and Opportunities Assessment

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Planning and Regulatory Capabilities				
Hazard Reduction Programs (Annually Conducted)				
Capital Improvements Program (CIP) or Plan				CIP and Master Plan
Annual Fire Prevention Plan				ACFPD conducts inspections, weed abatement, and public education but lacks a formal written prevention plan. Master Plan recommends formalizing these activities. District enforces state Fire & Building Codes and the District has adopted CAL FIRE FHSZ maps and Chapter 7A (where applicable)
Seismic Safety Program (Non-structural)				No formal non-structural seismic safety program exists. Station furnishings and equipment are not part of a district-wide anchoring protocol.
Earthquake Modernization Plan (Building Safety)				No district-wide plan for structural seismic upgrades. Station 211 received seismic improvements in 2003, but no formal modernization roadmap exists.
Stormwater Management Program (Annual Inspections)				Stormwater planning is under City/County jurisdiction. ACFPD has no dedicated stormwater inspection program
Hazard Plans and Programs				
Floodplain Response Plan				Flood planning is led by the City and Napa County Flood Control; ACFPD has no operational flood response plan.
Community Wildfire Protection Plan (CWPP)				CWPP update with Napa Firewise/participates in the Napa County CWPP.
Ground Water Management Planning / Plans				Groundwater management is handled by local water agencies; ACFPD has no role.
Climate Action Plan				City has a CAP; ACFPD is not a direct participant.
Drought Mgmt/ Contingency Plan				District has no drought plan.
FireWise Communities within District				None in American Canyon currently; many in Napa County

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Hazard-Related Public Outreach Program				Outreach occurs but is not structured around hazards.
Administrative and Technical				
Staff Capacity				
Emergency Manager				ACFPD has no dedicated emergency manager; responsibilities handled by City and County OES.
Civil Engineer				Civil engineering functions (e.g., water systems, drainage, access roads) fall under City or County Public Works. ACFPD does not employ or contract a civil engineer.
Dedicated Public Outreach Personnel				Admin Staff conduct outreach
GIS Specialist and Capability				Admin Staff plus City/County mapping.
Grant Manager, Writer, or Specialist				Admin Staff
Other	N/A	N/A	N/A	
Warning Systems/Services				
General				District relies on Nixle/Everbridge and shared social media
Flood				Flood alerting and warning responsibilities fall under City of American Canyon and Napa County Flood Control and Water Conservation District. ACFPD is not responsible for operating or activating flood-specific warning systems.
Wildfire				District uses Zonehaven/Everbridge but does not issue its own alerts.
Geological Hazards				District does not operate geological hazard warning systems.
Fiscal Capabilities				
Financial Resources for Hazard Mitigation				

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Levy for Specific Purposes with Voter Approval				District maintains a voter-approved Fire Service Fee and collects development impact fees.
Utilities Fees				ACFPD does not operate any utility lines or charge utility-based service fees.
System Development Fee				A 2023 Development Impact Fee Study established a Fire Capital Facilities Fee, which is assessed per square foot of new development. These fees fund apparatus purchases and station expansions needed to support growth. Periodic updates to the fee program can ensure funding keeps pace with inflation and construction costs.
General Obligation Bonds to Incur Debt				ACFPD has not issued general obligation bonds. The District could consider this tool to fund long-term facility upgrades or new station construction, pending voter approval.
Special Tax Bonds to Incur Debt				The existing Fire Mitigation Fee operates similarly to a special tax on new construction. ACFPD has explored Community Facilities District (CFD) or Mello-Roos financing options for larger development areas. These mechanisms could be expanded to fund hazard mitigation projects tied to growth.
Withheld Spending in Hazard-Prone Areas				No risk-based spending policies exist.
Stormwater Service Fees				Stormwater planning and funding fall under the jurisdiction of the City of American Canyon and Napa County. ACFPD does not charge or manage stormwater-related fees.
Capital Improvement Project Funding				CIP and Master Plan
Education / Outreach Capabilities				
Education/Outreach Resources				
Website Dedicated to Hazard Topics				ACFPD maintains a standalone page but relies on City webpage for hazard education.

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Dedicated Social Media				ACFPD has dedicated social media and in addition shares posts through City social media and occasionally cross-posts content via Napa Firewise or the City's emergency alerts.
Hazard Info. Avail. at Library/ Planning Desk				Hazard and preparedness materials are not known to be regularly stocked or distributed through the public library or City Planning counter. Could collaborate with Napa County Library or Planning Dept. to distribute defensible space handouts, wildfire zone maps, and Ready-Set-Go materials.
Annual Public Safety Events				ACFPD participates in National Night Out, fire station open houses, and school visits.
Ability to Field Public Tech. Assistance Requests				Handled informally via calls/visits.
Public Safety Newsletters or Printed Outreach				News Ladder monthly publication
Fire Safe Councils				Participation occurs but Council is not formalized.
Resource Conservation Districts				Coordination occurs but is project-specific.
Other	N/A	N/A	N/A	

6.6.2 American Canyon Fire Protection District Mitigation Action Plan

ACFPD's mitigation actions were developed through a collaborative process informed by the updated risk assessment, local priorities, and extensive stakeholder engagement. As a first-time participant in a hazard mitigation plan, ACFPD did not have any existing mitigation actions from a prior plan to evaluate. Therefore, all mitigation actions identified in this planning cycle are newly developed based on the district's updated risk assessment, local capabilities, and areas of concern identified during stakeholder engagement and interagency collaboration. These new actions were crafted to address the district's highest priority hazards, align with FEMA's hazard mitigation guidance, and reflect local infrastructure vulnerabilities and water resource challenges. The development of these mitigation strategies marks an important step in integrating resilience into the district's operations and long-term planning. All mitigation actions are documented in Volume 2, Table 6-7. This careful evaluation ensured that the updated action plan builds upon past commitments while also responding to current risks and future challenges.

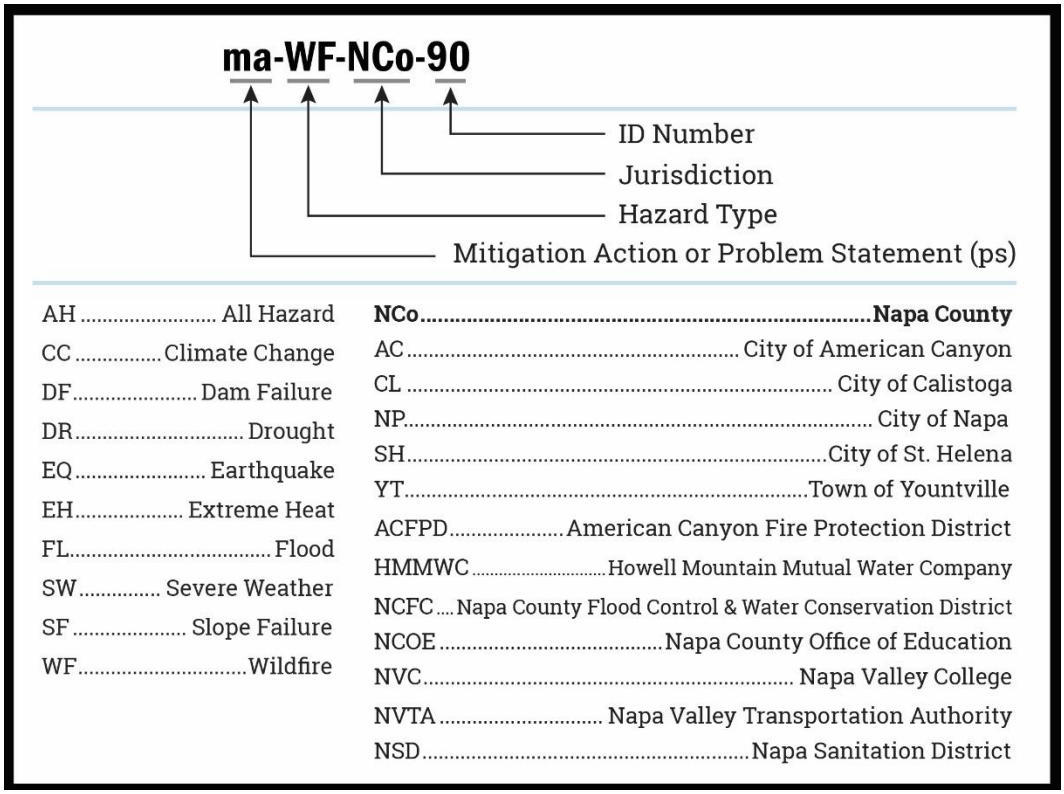


Figure 6-17: Mitigation Action Number Key

The plan addresses ACFPD's most significant hazards, including wildfire, earthquake, severe weather, and climate change. Each mitigation action is designed to align with FEMA's hazard mitigation guidance and the requirements of the Disaster Mitigation Act of 2000. Where appropriate, overlapping or redundant actions were consolidated into broader, more comprehensive strategies that improve clarity, increase feasibility, and strengthen regional coordination.

The mitigation action prioritization method used by all participating jurisdictions is described in Volume 1, Section 4. Each action specific to ACFPD is documented in Table 6-7, which identifies the responsible department, implementation timeframe, potential funding sources, and resources required to complete the action. Each action is also assigned a unique alphanumeric identifier (see Figure 6-17) that links the strategy to its associated hazard and supports consistent monitoring and reporting.

ACFPD's approach recognizes that some hazards are most effectively addressed through regional efforts. Weather and wildfire risk reduction often extend beyond the district's boundaries and require collaboration with county, regional, and state partners. By aligning local actions with regional strategies, ACFPD helps to consolidate resources, maximize funding opportunities, and ensure that mitigation projects achieve the greatest benefit for San Pablo Bay, the Napa Valley, and the wider Napa County community.

Collectively, these mitigation actions provide a roadmap for reducing hazard risk, protecting vulnerable populations, and strengthening the long-term resilience of ACFPD.

Table 6-7: ACFPD Mitigation Action Plan

Mitigation No.	Hazard Type	Sub-Hazard	Mitigation Type	Year	Primary Agency	Title	Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Problem Statements
ma-AH-ACFPD-001	All Hazard		ES - Emergency Services	2026	American Canyon Fire Protection District	Staffing Surge & Battalion Chief Capacity Plan	Develop phased staffing and Battalion Chief coverage strategy to increase response capacity for large, multi-hazard incidents.	Administrative Staff	Medium	Medium	1-3 Years	Capacity / Capability Building	HMGP / BRIC , General Fund	High	ps-EQ-ACFPD-001, ps-EQ-ACFPD-003, ps-EQ-ACFPD-004, ps-WF-ACFPD-004
ma-AH-ACFPD-002	All Hazard		PRV - Prevention	2026	American Canyon Fire Protection District	Reserves & Revenue Stability Assessment	Conduct a detailed fiscal resilience analysis to protect District operations from future declines in property tax or strike team revenue volatility.	Administrative Staff	Low	Medium	1-3 Years	Capacity / Capability Building	HMGP / BRIC , General Fund	Medium	ps-EQ-ACFPD-004, ps-SW-ACFPD-003, ps-WF-ACFPD-004
ma-EQ-ACFPD-001	Earthquake		PPRO - Property Protection	2026	American Canyon Fire Protection District	Station 211 Seismic Vulnerability Reduction Planning	Develop a seismic vulnerability assessment and replacement plan for undersized, outdated Station 211 to maintain operational readiness.	Administrative Staff	Low	Medium	1-3 Years	Project	HMGP / BRIC , General Fund	High	ps-EQ-ACFPD-002
ma-EQ-ACFPD-002	Earthquake		PPRO - Property Protection	2026	American Canyon Fire Protection District	Earthquake Equipment Securing & Continuity Upgrades	Install equipment tie-downs, secure storage, and backup communications to prevent damage during strong shaking.	Administrative Staff	Low	High	3-5 Years	Project	HMGP / BRIC , General Fund	Medium	ps-EQ-ACFPD-001, ps-EQ-ACFPD-003
ma-SW-ACFPD-001	Severe Weather	All	ES - Emergency Services	2026	American Canyon Fire Protection District	Severe Weather Response Protocol Development	Create new operational protocols for high-wind, atmospheric river, and storm-related hazards, addressing access delays, safety precautions, and resource deployment.	Administrative Staff	Low	Medium	1-3 Years	Capacity / Capability Building	HMGP / BRIC , General Fund	High	ps-SW-ACFPD-003, ps-SW-ACFPD-001, ps-SW-ACFPD-002
ma-SW-ACFPD-002	Severe Weather	All	PRV - Prevention , ES - Emergency Services	2026	American Canyon Fire Protection District	Storm Access Route Reliability Mapping	Identify and pre-map alternative access routes during storm-related road closures or flooding to ensure operational continuity.	Administrative Staff	Low	Medium	3-5 Years	Capacity / Capability Building	HMGP / BRIC , General Fund	Medium	ps-SW-ACFPD-002, ps-SW-ACFPD-001
ma-WF-ACFPD-001	Wildfire		NRP - Natural Resource Protection	2026	American Canyon Fire Protection District	Targeted Greenbelt Fuels Reduction Program	Implement recurring fuels reduction focused on eucalyptus stands, open-space greenbelts, and high-risk areas adjacent to adult/childcare facilities.	Administrative Staff	Medium	High	1-3 Years	Project	HMGP / BRIC , CalFIRE , General Fund	High	ps-WF-ACFPD-001, ps-WF-ACFPD-002
ma-WF-ACFPD-002	Wildfire		PRV - Prevention	2026	American Canyon Fire Protection District	Wildfire Evacuation Support & Access Reliability	Improve emergency access near high-risk facilities by pre-planning ingress/egress, signage, and clearing overgrown roadside vegetation.	Administrative Staff	Low	Medium	3-5 Years	Project	HMGP / BRIC , General Fund	Medium	ps-WF-ACFPD-004, ps-WF-ACFPD-002, ps-WF-ACFPD-001
ma-WF-ACFPD-003	Wildfire		PE&A - Public Education & Awareness	2026	American Canyon Fire Protection District	Wildfire Public Information & Smoke Impact Program	Launch a proactive public-information program focused on smoke impacts, community preparedness, and local outdoor fuel hazards.	Administrative Staff	Low	Medium	3-5 Years	Capacity / Capability Building	HMGP / BRIC , CalFIRE , General Fund	Medium	ps-WF-ACFPD-003, ps-WF-ACFPD-004, ps-WF-ACFPD-002, ps-WF-ACFPD-001

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Napa County

Multi-Jurisdictional Hazard Mitigation Plan Update

2026

Section 7. Howell Mountain Mutual Water Company

VOLUME 2
JURISDICTIONAL ANNEXES

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Napa County

2026 Multi-Jurisdictional Hazard Mitigation Plan Update

Howell Mountain Mutual Water Company (HMMWC)

Special Agency Annex

Section 7. Howell Mountain Mutual Water Company 7-1

7.1 Scope & Purpose 7-1

7.2 Jurisdictional Setting 7-1

7.2.1 Geography & Climate 7-3

7.2.2 Demographics & Vulnerable Populations 7-6

7.2.3 Economy 7-20

7.2.4 Growth Trends & Future Development 7-21

7.3 Planning Process 7-22

7.3.1 Public Input & Draft Review 7-24

7.4 What's New 7-25

7.4.1 Mitigation Activities 7-25

7.4.2 Mitigation Successes 7-26

7.5 Risk Assessment 7-28

7.5.1 Hazard Screening & Prioritization 7-28

7.5.2 Vulnerability to Specific Hazards 7-32

7.5.3 Climate Change Impacts & Vulnerable Populations 7-48

7.5.4 Hazard Problem Statements 7-49

7.6 Mitigation Strategy 7-53

7.6.1 Capabilities & Opportunities 7-54

7.6.2 HMMWC Mitigation Action Plan 7-65

7.6.1 Status of Previous Mitigation Actions 7-68

List of Figures

Figure 7-1: HMMWC Geographic Overview Map 7-5
Figure 7-2: HMMWC Median Household Income Map 7-9
Figure 7-3: HMMWC Poverty Status Map 7-10
Figure 7-4: HMMWC Housing Occupancy Map 7-11
Figure 7-5: HMMWC Dependent Age Groups Map 7-13
Figure 7-6: HMMWC Disabled Elderly Map 7-14
Figure 7-7: HMMWC Race and Ethnicity Map 7-16
Figure 7-8: HMMWC Spanish-Speaking Households Map 7-17
Figure 7-9: HMMWC CDC Social Vulnerability Index Map 7-19
Figure 7-10: HMMWC Risk Assessment Matrix 7-30
Figure 7-11: Exposure Summary – HMMWC Wildfire Risk 7-34
Figure 7-12: Exposure Summary – HMMWC Dam Failure Risk 7-37
Figure 7-13: Exposure Summary – HMMWC Earthquake Risk (M7.1 Hunting Creek–Berryessa) 7-40
Figure 7-14: Exposure Summary – HMMWC Earthquake Risk (M6.7 West Napa) 7-41
Figure 7-15: Drought Severity Timeline 2000-2026 7-44
Figure 7-16: Mitigation Action Number Key 7-65

List of Tables

Table 7-1: HMMWC Planning Team and Steering Group Members 7-23
Table 7-2: HMMWC Planning Team Meetings 7-24
Table 7-3: HMMWC Document Review of Potential Hazards 7-29
Table 7-4: HMMWC Hazards Prioritization Summary 7-31
Table 7-5: Drought Classifications and Impacts 7-43
Table 7-6: HMMWC Hazard Problem Statements 7-49
Table 7-7: HMMWC Capabilities and Opportunities Assessment 7-60
Table 7-8: HMMWC Mitigation Action Plan 7-67
Table 7-9: HMMWC Status of Previous Mitigation Actions 7-68

Adoption Resolution

To comply with the Federal Disaster Mitigation Act of 2000 (DMA 2000), The Howell Mountain Mutual Water Company Board of Directors has officially adopted this 2026 Napa County Multi-Jurisdictional Hazard Mitigation Plan, including Volume 1 in its entirety as well as this Volume 2 municipal annex. The adoption of the MJHMP recognizes the district's commitment to reducing the impacts of natural hazards within its jurisdiction and across Napa County.

A copy of the district's adoption record is provided on the following pages. Adoption records for all jurisdictions are summarized in Volume 1, Table ES-1.

ADOPTION RECORD TO BE INSERTED UPON COMPLETION.

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Section 7. Howell Mountain Mutual Water Company

7.1 Scope & Purpose

This Jurisdictional Annex for the Howell Mountain Mutual Water Company (HMMWC) of the 2026 Napa County Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) details the hazard mitigation planning elements specific to the district's planning area. The annex is not intended to be a standalone document but appends to and supplements the information contained in the umbrella plan document (Volume 1). As such, all sections of the umbrella plan, including the planning process and other procedural requirements, apply to and were met by the district. This annex provides additional information specific to the district, with a focus on hazard identification and risk assessment, vulnerability assessment, problem statements, mitigation strategy, and capabilities assessment. Below are HMMWC's Points of Contact:

Primary Point of Contact	Alternate Point of Contact
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7.2 Jurisdictional Setting

HMMWC is a California nonprofit mutual benefit corporation that provides potable water service to the Angwin and Howell Mountain area of Napa County. The company operates as a member-owned mutual water utility serving a predominantly residential population located within a rural, mountainous environment. The service area is characterized by forested lands, steep slopes, narrow and winding roadways, and limited transportation access, all of which influence both day-to-day operations and hazard vulnerability. Unlike municipal utilities, HMMWC functions as an independent entity governed by its membership and Board of Directors, with organizational authority, financial decision-making, and operational direction established through its adopted bylaws.

HMMWC's governance structure reflects its status as a nonprofit mutual benefit corporation organized under California law. Company assets, including land, reservoirs, treatment facilities, and distribution infrastructure, are held for the benefit of the membership and are used primarily for water supply, treatment, storage, and delivery functions. The Board of Directors is responsible for overseeing company policies, financial management, capital improvements, and regulatory compliance. Regular Board meetings are publicly noticed and conducted in a manner that supports transparency and member participation. Operational management is carried out by company staff responsible for treatment plant operations,

watershed and reservoir management, distribution system maintenance, water quality monitoring, and customer service functions.

The HMMWC service area is situated within a rural mountain setting that significantly shapes the system's operational and hazard context. Development patterns consist largely of low-density residential uses interspersed with forested and watershed lands. The mountainous terrain presents inherent challenges related to infrastructure construction, maintenance, and emergency access. Steep slopes and complex topography contribute to increased exposure to slope instability, erosion, and storm-related impacts. Limited roadway access and constrained evacuation routes further amplify the importance of reliable utility service during emergencies. As a lifeline utility, HMMWC plays a critical role in supporting residential occupancy, public health, and fire protection capabilities within the community.

HMMWC's water supply system relies on a combination of surface water reservoirs and groundwater wells. The company owns and manages a watershed comprising approximately 263 acres, within which nine interconnected reservoirs provide raw water storage. These reservoirs, along with multiple intake structures and groundwater wells, form a distributed water supply network typical of small mountain utilities. The system's reliance on stored surface water makes reservoir levels and watershed conditions primary determinants of water availability and system reliability. Variations in precipitation, extended drought conditions, and watershed disturbances therefore have direct implications for operational continuity.

The regulatory environment governing HMMWC includes oversight by the California Division of Drinking Water and compliance with federal Safe Drinking Water Act requirements. Water quality monitoring, treatment standards, and reporting obligations are documented annually through Consumer Confidence Reports. Source water assessments have identified potential vulnerabilities associated with surrounding land uses, including agricultural activities located near drinking water sources. Maintaining regulatory compliance under varying environmental conditions requires ongoing system monitoring, infrastructure maintenance, and adaptive operational strategies.

HMMWC's jurisdictional setting presents several hazard-relevant operational considerations. The system's dependence on watershed-derived surface water introduces sensitivity to drought conditions, reduced snowpack and precipitation, and climate variability. Prolonged dry periods directly affect reservoir storage capacity, prompting the adoption of staged drought response measures designed to conserve water and maintain service reliability. The forested mountain environment also results in elevated wildfire exposure, with potential impacts including damage to reservoirs, intake structures, and distribution infrastructure, as well as post-fire water quality degradation and increased sedimentation. Watershed management activities, including vegetation and fuel reduction efforts, represent ongoing strategies to reduce wildfire-related risks.

Infrastructure vulnerability is further influenced by the region's terrain and geologic conditions. Steep slopes increase the potential for landslides, slope failures, and erosion events that may disrupt pipelines, access routes, and treatment facilities. Seismic hazards present an additional risk factor, as earthquake events have the potential to damage reservoirs, pipelines, and mechanical systems.

Power reliability represents another critical factor within HMMWC's operational context. Treatment, pumping, and control systems depend on electrical infrastructure susceptible to wildfire-related outages,

storm damage, and Public Safety Power Shutoff events. Interruptions to power service can directly affect water production, storage, and distribution functions, highlighting the interconnected nature of utility systems and hazard impacts. Operational planning and equipment upgrades are therefore essential components of maintaining continuity under adverse conditions.

HMMWC's location within Napa County and the State of California are shown in Figure 7-1.

- **Year of Incorporation:** 1985
- **2023 Population Served:** ~1,617 (CAS 5-Year, 2018-2023)
- **Coverage Area:** ~263 acres

7.2.1 Geography & Climate

HMMWC operates within the Howell Mountain / Angwin area of Napa County, a region defined by rugged mountainous terrain, steep slopes, and heavily forested landscapes. The service area is situated at higher elevations relative to the Napa Valley floor, resulting in cooler average temperatures but also increased exposure to terrain-driven hazards. The topography is characterized by narrow ridgelines, incised drainages, and complex slope systems that influence watershed behavior, infrastructure placement, and system maintenance activities. Steep gradients and variable geologic conditions contribute to localized slope instability, erosion, and drainage challenges, all of which have implications for pipelines, reservoirs, and access routes.

The region's geography plays a central role in shaping HMMWC's water supply and operational framework. The company's watershed lands, reservoirs, and intake structures are embedded within a natural environment dominated by mixed forest, woodland, and wildland vegetation. These landscapes support raw water capture and storage but also introduce environmental sensitivities and hazard exposures. Dense vegetation, limited defensible space in some areas, and constrained roadway access collectively elevate wildfire risk and complicate emergency response operations. The mountainous setting further restricts infrastructure redundancy options, as steep terrain and limited developable corridors constrain pipeline routing and system expansion opportunities.

Access throughout the service area is primarily provided by winding, two-lane mountain roadways that are susceptible to disruption from landslides, fallen trees, wildfire events, and severe weather. These transportation limitations affect both routine maintenance operations and post-disaster recovery activities. In emergency conditions, geographic isolation may delay repair efforts, equipment mobilization, and mutual aid access. As a result, the physical landscape directly influences system resilience, emphasizing the importance of preventative maintenance, localized storage capacity, and hazard-aware infrastructure planning.

The climate of the Howell Mountain region is consistent with a Mediterranean pattern typical of much of California, characterized by cool, wet winters and warm, dry summers. Precipitation is highly seasonal, with the majority of annual rainfall occurring between late fall and early spring. Summer months are typically marked by prolonged dry conditions, low humidity, and elevated temperatures, contributing to increased wildfire potential and heightened stress on water supply systems. Interannual variability in precipitation,

including multi-year drought cycles, is a defining feature of the regional climate and a primary driver of water resource management challenges.

Drought conditions represent a recurring and significant influence on HMMWC operations. Reduced rainfall and diminished watershed recharge directly affect reservoir storage levels, raw water availability, and system reliability. Extended dry periods may necessitate staged conservation measures, demand management strategies, and operational adjustments designed to preserve limited water supplies. Climate variability, including fluctuations associated with El Niño and La Niña patterns, can result in alternating periods of above-average precipitation and severe drought, increasing uncertainty in long-term water planning.

Seasonal climate conditions also intensify wildfire risk within the service area. Hot, dry summers combined with periodic wind events create conditions conducive to rapid fire spread. Wildfire impacts may include direct damage to watershed lands, reservoirs, intake structures, electrical infrastructure, and distribution systems. Post-fire conditions can further degrade water quality through increased sedimentation, ash transport, and altered runoff patterns. These climate-driven hazard interactions underscore the interconnected nature of environmental processes and utility system vulnerability.

Emerging climate trends, including rising average temperatures, increased frequency of extreme heat events, and shifting precipitation patterns, introduce additional considerations for long-term system resilience. Higher temperatures may increase water demand, accelerate reservoir evaporation, and extend wildfire seasons. Changes in storm intensity and rainfall distribution may contribute to both flooding and erosion hazards, affecting infrastructure stability and watershed function. Collectively, these geographic and climatic factors establish the environmental context within which HMMWC must operate, adapt, and plan for future hazard conditions.

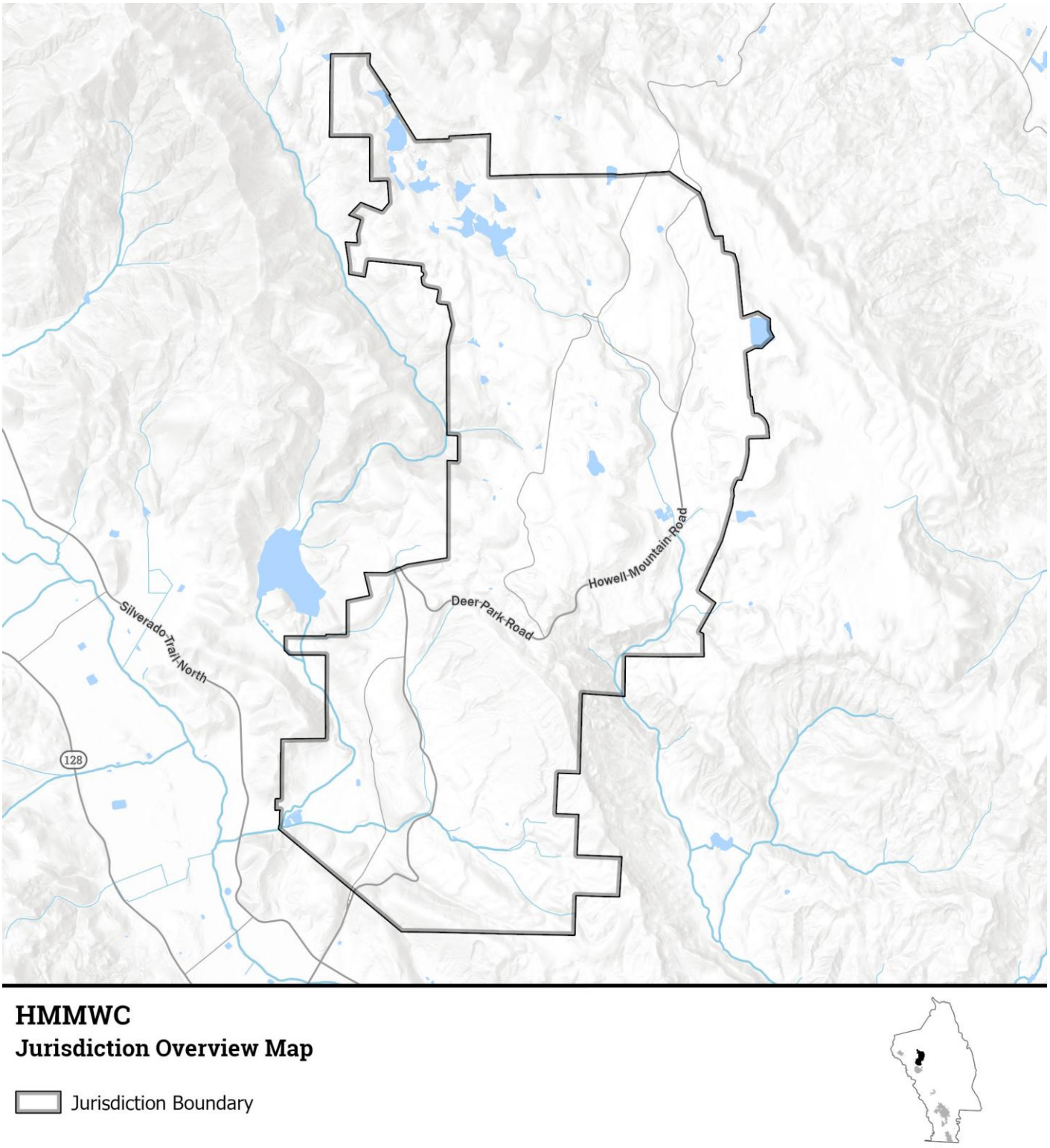


Figure 7-1: HMMWC Geographic Overview Map

7.2.2 Demographics & Vulnerable Populations

HMMWC provides potable water service to a small, primarily residential population located within the Angwin and Howell Mountain area of Napa County. The service area is characterized by low-density development patterns typical of rural mountain communities, where residential parcels are dispersed across steep terrain and heavily forested landscapes. The population served by HMMWC reflects a mix of full-time residents, seasonal occupants, rental properties, and institutional uses associated with the Angwin community. As a member-owned mutual water company, the customer base largely consists of property owners who hold water rights, along with tenants residing on served parcels.

The demographic composition of the service area is influenced by its geographic setting. Rural mountain communities often exhibit population characteristics distinct from urbanized areas, including smaller household clusters, reduced infrastructure redundancy, and greater dependence on localized utility systems. These conditions increase the importance of reliable water service for maintaining habitability, sanitation, and fire protection capabilities. The dispersed nature of development also affects emergency response dynamics, evacuation logistics, and post-disaster recovery timelines.

Several population groups within the HMMWC service area may experience heightened vulnerability during hazard events. Elderly residents, individuals with disabilities, and persons with access or functional needs may face increased challenges related to evacuation, mobility, and continuity of essential services. Interruptions to potable water supply, whether caused by drought, wildfire, seismic events, or infrastructure damage, may disproportionately affect individuals requiring medical care, sanitation support, or temperature regulation. Rural mountain environments can amplify these challenges due to limited transportation options, longer emergency response times, and constrained access routes.

Housing characteristics within the service area also contribute to vulnerability considerations. Many residential structures are located within wildland-urban interface (WUI) environments where wildfire exposure is elevated. Hazard events such as the Glass Fire have demonstrated the potential for large-scale residential displacement within the community. Such events illustrate the direct relationship between hazard impacts, housing stability, and utility service demand. Displaced residents may face financial hardship, insurance challenges, and prolonged reconstruction timelines, all of which influence water system operations and customer support policies.

Socioeconomic vulnerability may also be present within the service population. Households experiencing financial constraints may face difficulty absorbing rate adjustments, infrastructure repair costs, or conservation-related penalties during drought conditions. Because HMMWC operates as a mutual benefit corporation rather than a subsidized municipal utility, financial sustainability is closely tied to member contributions, rate structures, and system maintenance needs. Economic stressors associated with hazard events, including property damage or loss of income, can therefore affect both customers and system operations.

Language access represents an additional component of population vulnerability. The Consumer Confidence Reports explicitly include notices requiring landlords to provide tenants with copies of the report and present critical water quality information in multiple non-English languages. This requirement reflects recognition that portions of the service population may have limited English proficiency. During emergency conditions, clear communication regarding water safety, conservation mandates, boil water notices, or service interruptions is essential. Language barriers may increase risk by delaying comprehension of protective actions or emergency instructions. (HMMWC, 2024)

Institutional and community-dependent populations within the Angwin area further shape vulnerability dynamics. The presence of educational facilities, congregate housing, and community-serving institutions may concentrate individuals who are more sensitive to utility disruptions. Water service interruptions affecting such facilities may have cascading consequences, including sanitation challenges, reduced fire protection capability, and operational constraints. These interdependencies underscore the role of HMMWC as a critical lifeline provider supporting public health, safety, and community stability.

7.2.2.1 Income & Housing

Analysis of American Community Survey (ACS) data illustrates distinct geographic patterns in both median household income and poverty rates within the district, reflecting differences in housing stock, development history, and land use.

Income characteristics within the HMMWC service area suggest a generally higher median household income relative to many other rural regions. Figure 7-2 shows that large portions of the service boundary fall within the upper income ranges represented on the map. Higher median incomes may indicate increased household capacity to absorb certain hazard-related costs, including insurance premiums, property hardening measures, and infrastructure repair expenses. Communities with higher income levels may also demonstrate greater access to financial resources, lending mechanisms, and recovery assistance following disaster events.

However, elevated median income values do not eliminate vulnerability. Income distributions within small geographic areas can mask variability among households, including the presence of fixed-income residents, retirees, and individuals with limited financial flexibility. Even in comparatively higher-income communities, hazard events such as wildfire can produce significant uninsured or underinsured losses, particularly where rebuilding costs, code compliance upgrades, and insurance market constraints intersect. Housing loss or damage may therefore impose substantial economic strain despite broader income indicators.

Figure 7-3 indicates that the overall proportion of residents living below the federal poverty threshold is relatively low across much of the HMMWC service area. Lower poverty rates are generally associated with reduced baseline socioeconomic vulnerability and increased adaptive capacity. Nevertheless, localized pockets of economic vulnerability may still exist, particularly within areas characterized by rental housing, multi-family units, or seasonal occupancy. Households experiencing financial constraints may face heightened challenges related to hazard preparedness, emergency response, and long-term recovery.

The housing patterns within the HMMWC service area reflect the rural, residential nature of the community. Figure 7-4 indicates that a substantial proportion of housing units within the service boundary are owner-occupied, with many census block groups exhibiting owner-occupancy rates at the upper end of the mapped range. This pattern is consistent with development characteristics typical of mountain and rural communities, where residential properties are more likely to be individually owned rather than rented. High owner-occupancy rates often correlate with longer-term residency, increased investment in property maintenance, and greater financial exposure to hazard-related damages.

Owner-occupied housing introduces distinct resilience considerations. Property owners typically bear the direct costs associated with structural retrofits, defensible space improvements, insurance coverage, and post-disaster repairs. In hazard-prone environments such as Howell Mountain, this ownership structure may increase financial vulnerability following wildfire, earthquake, or landslide events. Damage to residential structures may result in substantial economic losses for individual households, prolonged displacement, and complex recovery processes. Hazard events affecting housing stability therefore have cascading implications for both community resilience and utility service demand.

Housing and income characteristics within the Howell Mountain region are further shaped by the area's wildland-urban interface setting. Residential structures are dispersed throughout heavily vegetated landscapes where wildfire exposure is elevated. Hazard events affecting housing stock, such as the Glass Fire, have demonstrated the potential for widespread structural losses and long-term displacement. Rebuilding timelines, insurance availability, and construction costs collectively influence recovery trajectories and community stability.

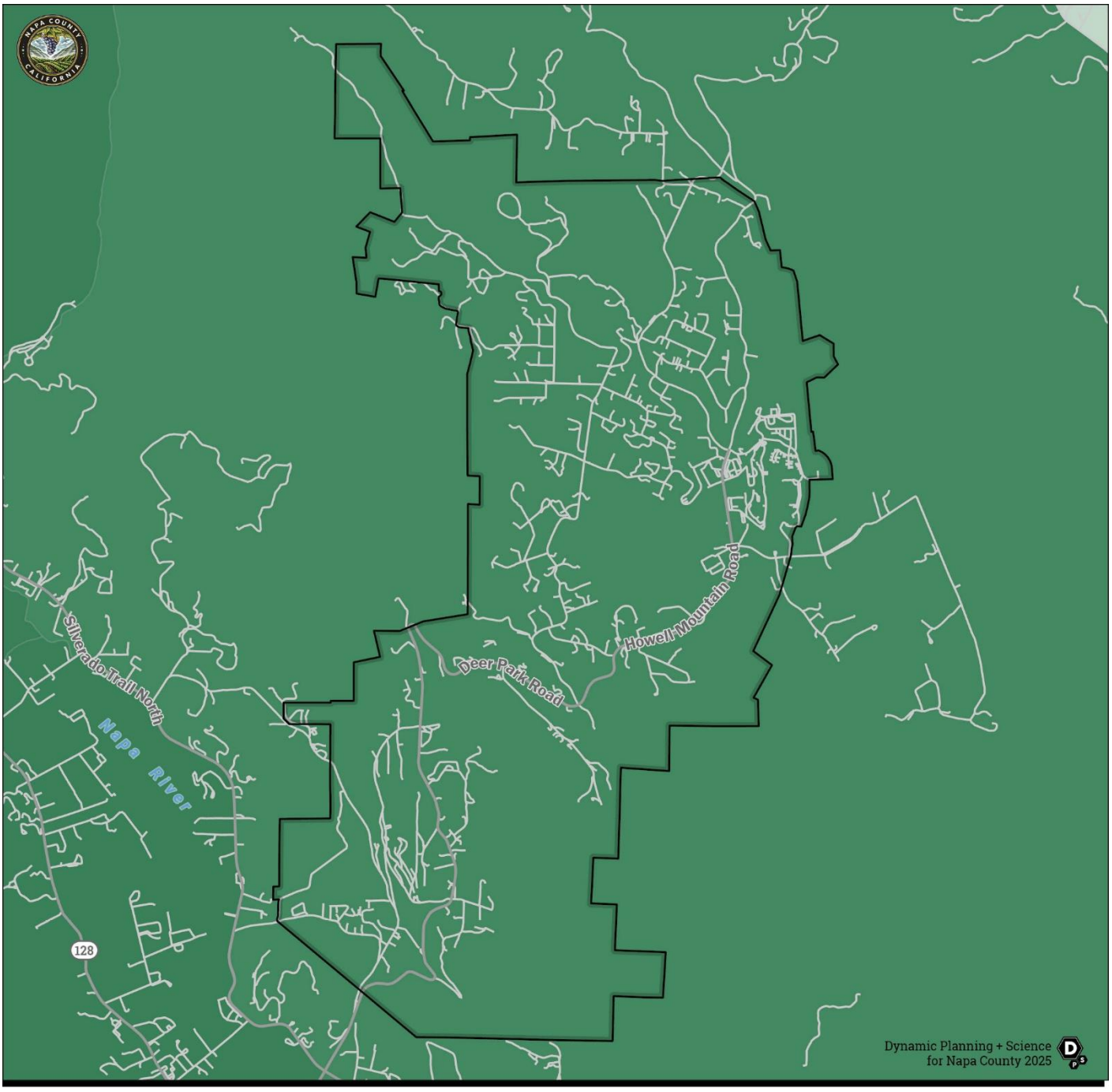


Figure 7-2: HMMWC Median Household Income Map

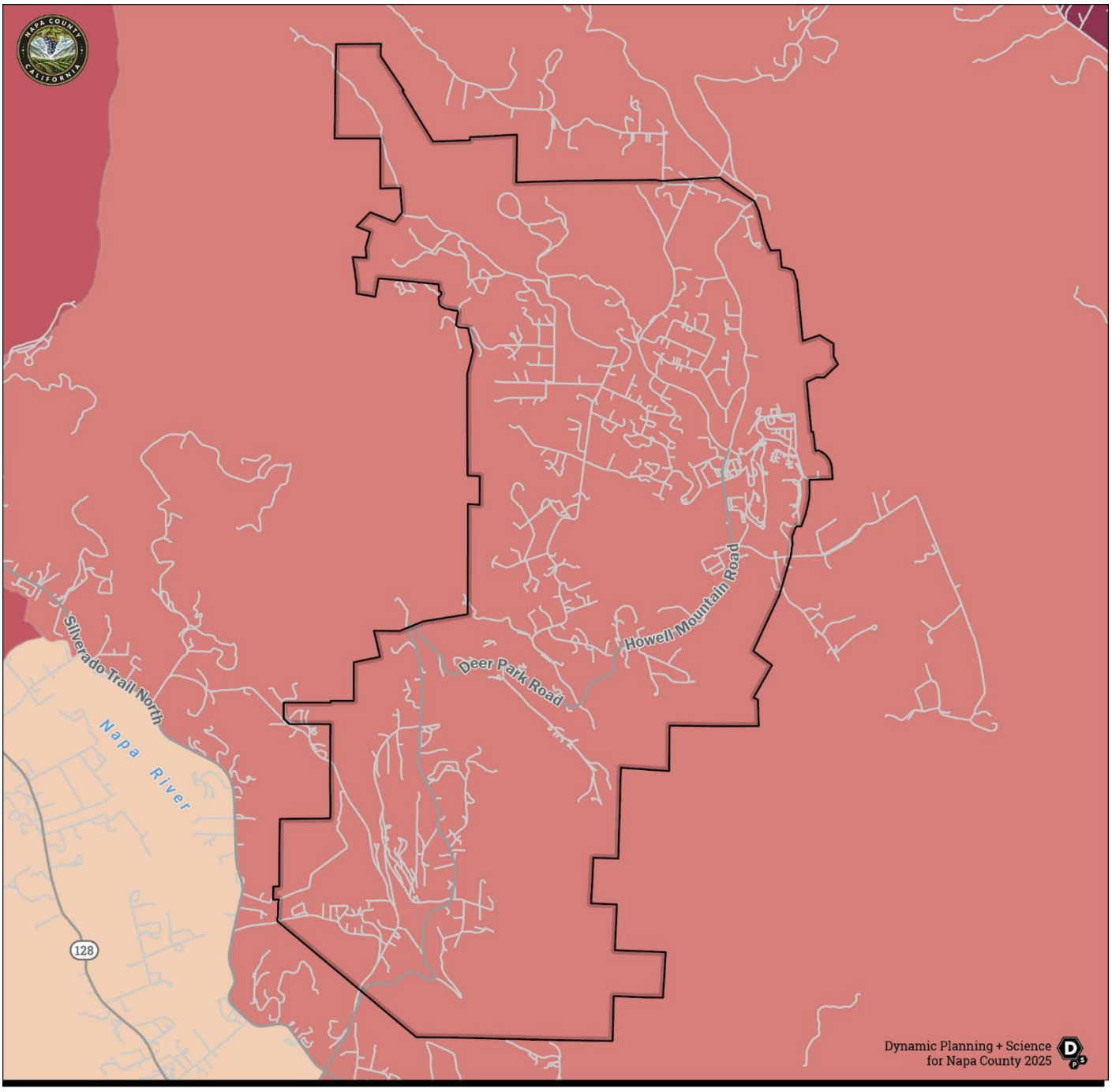


Figure 7-3: HMMWC Poverty Status Map

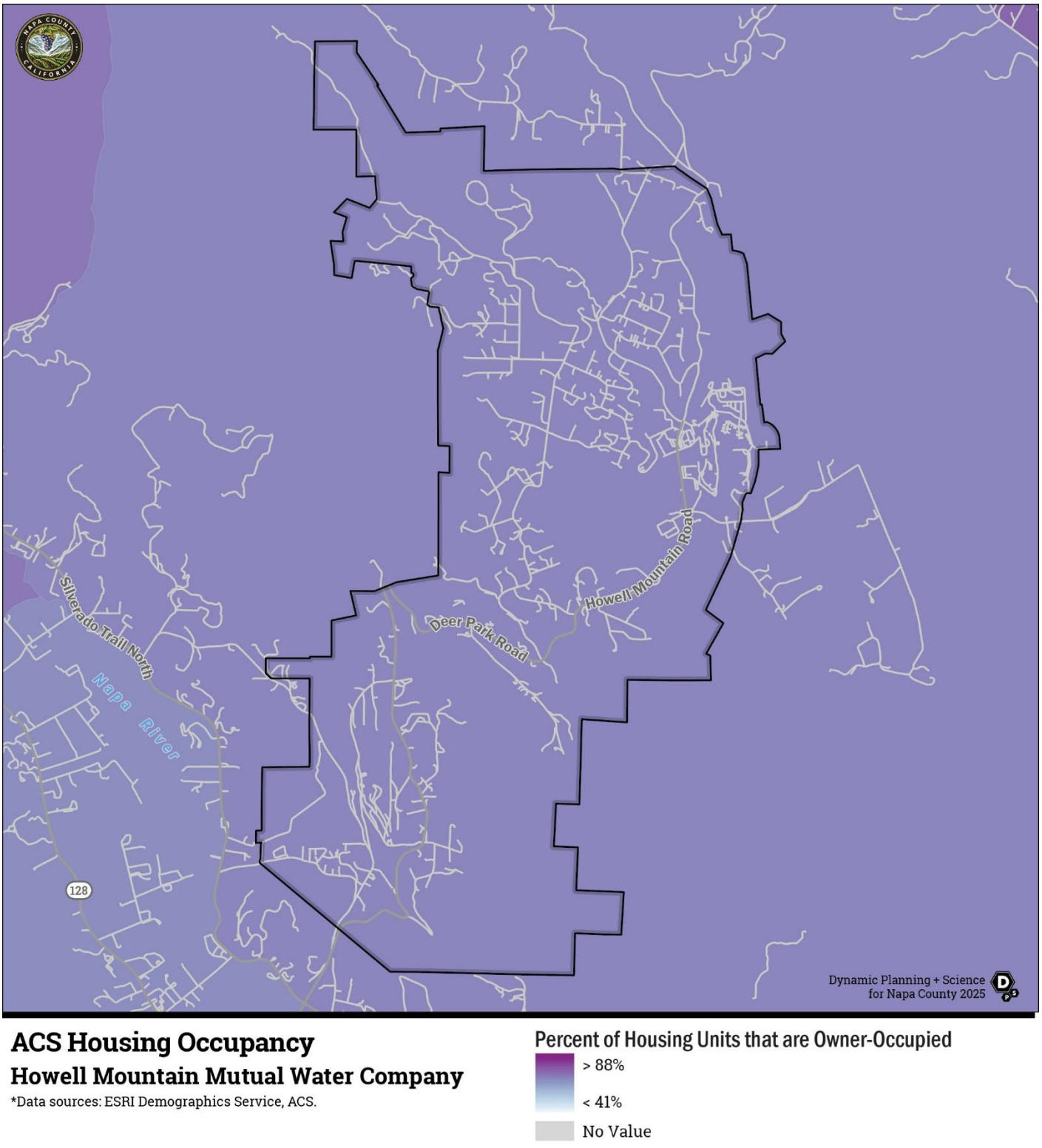


Figure 7-4: HMMWC Housing Occupancy Map

7.2.2.2 Dependent & Disabled Populations

Analysis of American Community Survey (ACS) data shows distinct geographic patterns in the concentration of residents in dependent age groups, children and older adults, as well as elderly residents living with disabilities. These populations may require additional assistance before, during, and after emergency events, and their spatial distribution has direct implications for evacuation planning, emergency response, and recovery.

Demographic patterns within the HMMWC service area indicate the presence of populations that may experience elevated vulnerability during hazard events. Figure 7-5 illustrates the spatial distribution of residents typically classified as dependents, including individuals under the age of 18 and adults over the age of 65. Across much of the service boundary, the proportion of residents within these dependent age categories falls within the lower to moderate ranges represented on the map. This pattern is consistent with rural residential communities where household compositions often vary between families, working-age adults, and retirees.

Dependent populations represent an important consideration in hazard mitigation planning because they may require additional assistance during emergencies. Younger residents rely on caregivers for evacuation, sheltering, and access to essential services, while older adults may face mobility limitations, medical dependencies, or heightened sensitivity to service disruptions. In geographically constrained mountain environments, evacuation complexity, limited transportation options, and extended response times can amplify these challenges. Disruptions to potable water service, whether caused by wildfire, drought, seismic activity, or infrastructure damage, may therefore have disproportionate effects on dependent populations.

Figure 7-6 provides further insight into populations with potential access and functional needs. The map indicates that the percentage of elderly residents (65 years and older) living with a disability varies across the service area but generally falls within the lower ranges depicted. Even where disability prevalence is comparatively low, the presence of elderly individuals with mobility, sensory, or health-related limitations introduces specific resilience considerations. Hazard events that affect infrastructure, utilities, or transportation networks may significantly impact individuals who depend on medical equipment, caregiver support, or consistent access to water for health and sanitation purposes.

Disabled and elderly populations often experience heightened risk during disasters due to evacuation barriers, communication challenges, and increased dependence on lifeline utilities. In rural mountain settings such as Howell Mountain, these risks may be compounded by terrain-driven constraints, including steep driveways, limited roadway connectivity, and potential isolation during wildfire or severe weather events. Extended power outages or water service interruptions may further exacerbate health and safety concerns for individuals requiring climate control, hydration, hygiene, or medical care.

Water system reliability is particularly critical for these populations. Potable water supports not only basic consumption but also sanitation, temperature regulation, and medical needs. Interruptions to water delivery or water quality degradation may therefore produce cascading impacts affecting household health, safety, and habitability. Understanding the distribution and characteristics of dependent and disabled populations is essential for evaluating hazard consequences, prioritizing mitigation investments, and supporting equitable resilience outcomes.

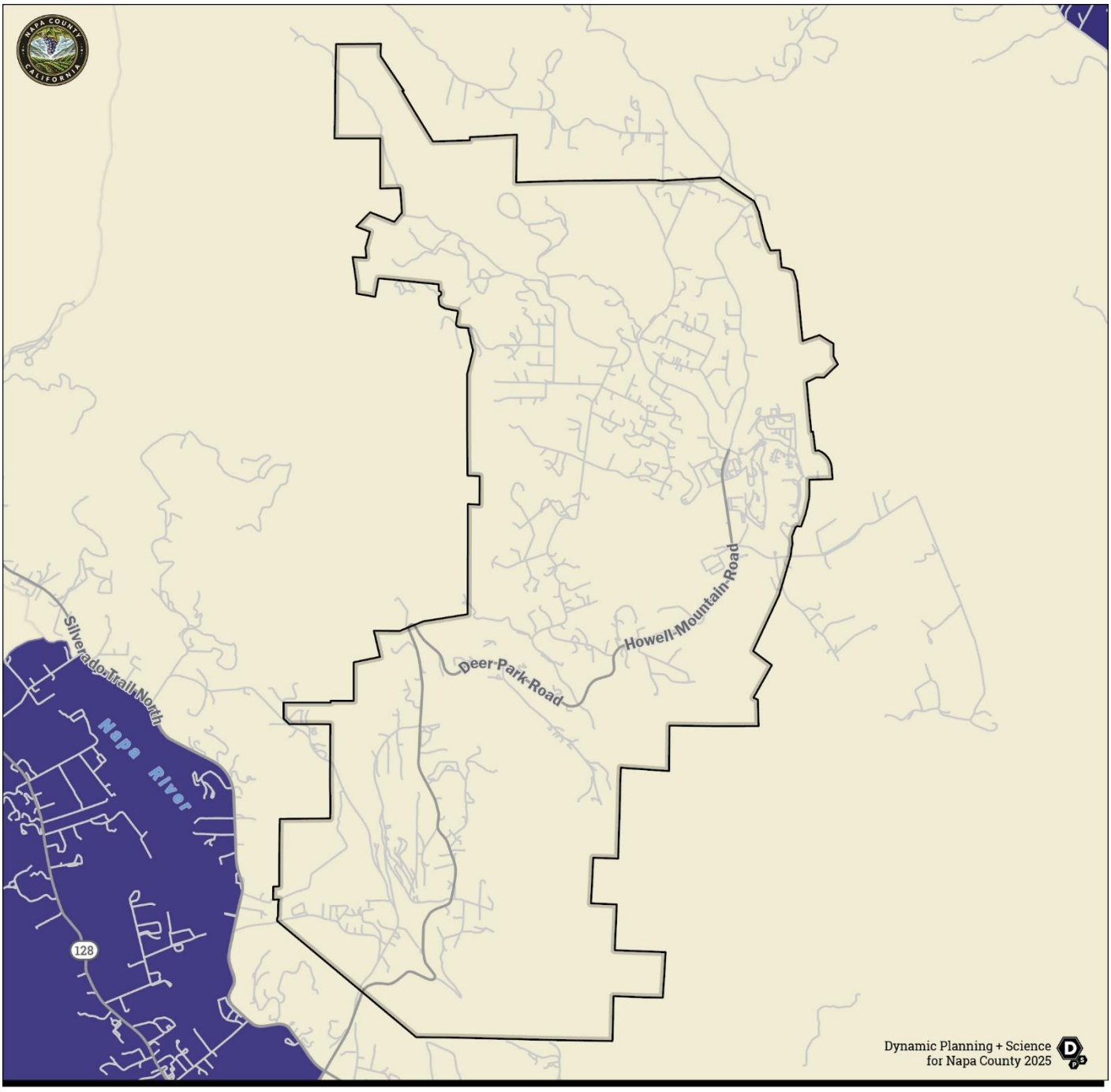


Figure 7-5: HMMWC Dependent Age Groups Map

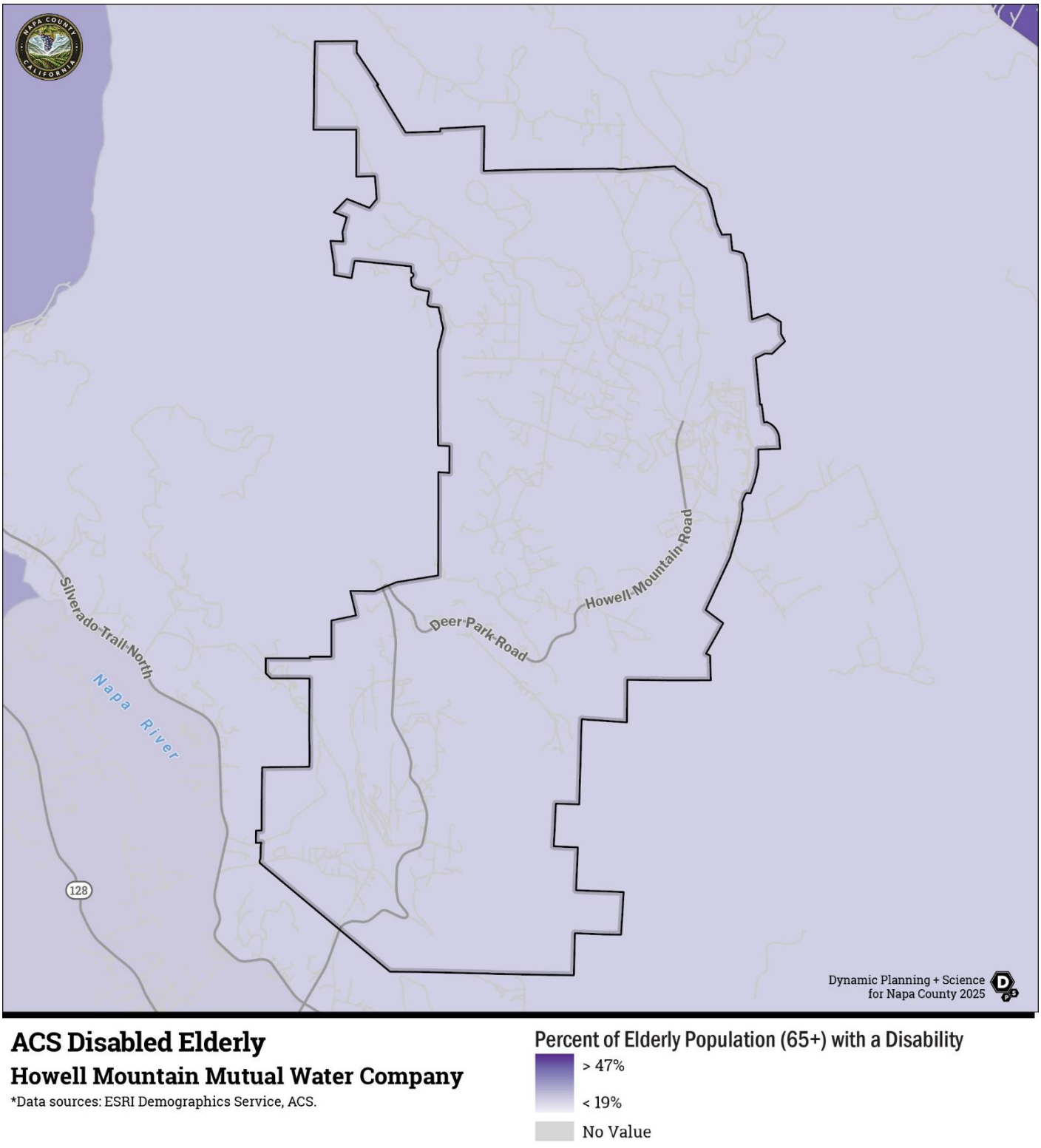


Figure 7-6: HMMWC Disabled Elderly Map

7.2.2.3 Race, Ethnicity & Language

Demographic patterns within the HMMWC service area reflect the broader population characteristics of the Angwin and Howell Mountain region. The ACS Race and Ethnicity Predominance snapshot, Figure 7-7, indicates that much of the service boundary is classified within categories associated with White alone, not Hispanic or Latino populations. This distribution is generally consistent with development patterns typical of rural mountain communities, where housing density is low and residential land uses dominate. While the predominance mapping highlights the largest represented racial or ethnic group within each census geography, it does not imply homogeneity, as smaller but meaningful demographic diversity may still be present throughout the service area.

Race and ethnicity are important considerations in hazard mitigation planning because they are often correlated with variations in socioeconomic conditions, housing characteristics, language access, and access to resources. Even in areas where a single demographic category is predominant, underlying diversity may influence household-level vulnerability, risk perception, and recovery capacity. Demographic diversity may also affect communication strategies, emergency preparedness outreach, and the effectiveness of hazard-related notifications issued by the water company.

Figure 7-8 provides additional insight into communication and access considerations within the HMMWC service population. The map indicates that the proportion of residents who speak Spanish at home is generally low across most of the service boundary. This pattern suggests that English is the primary language used within the community. However, lower mapped percentages do not eliminate the presence of households with limited English proficiency. Even small language minority populations warrant consideration in hazard mitigation and emergency communication planning, particularly where protective actions, public health advisories, or water safety notifications are involved.

HMMWC's regulatory communication practices recognize the importance of language accessibility. The Consumer Confidence Reports explicitly require landlords and property managers to distribute water quality information to tenants and include multilingual notices emphasizing the need to provide translated materials where appropriate. This framework acknowledges that portions of the service population may rely on languages other than English for critical information. During hazard events, including wildfire, drought emergencies, or water quality incidents, timely and understandable communication is essential for ensuring that all residents can take appropriate protective actions.

Language and cultural factors may influence hazard awareness, preparedness behaviors, and response actions. Households facing language barriers may experience delayed comprehension of emergency instructions, boil water advisories, or conservation mandates. These challenges may be particularly consequential in rapidly evolving events such as wildfires, where evacuation orders, service disruptions, and public safety information must be clearly conveyed. Even in communities with low overall language diversity, planning frameworks benefit from incorporating inclusive communication strategies.

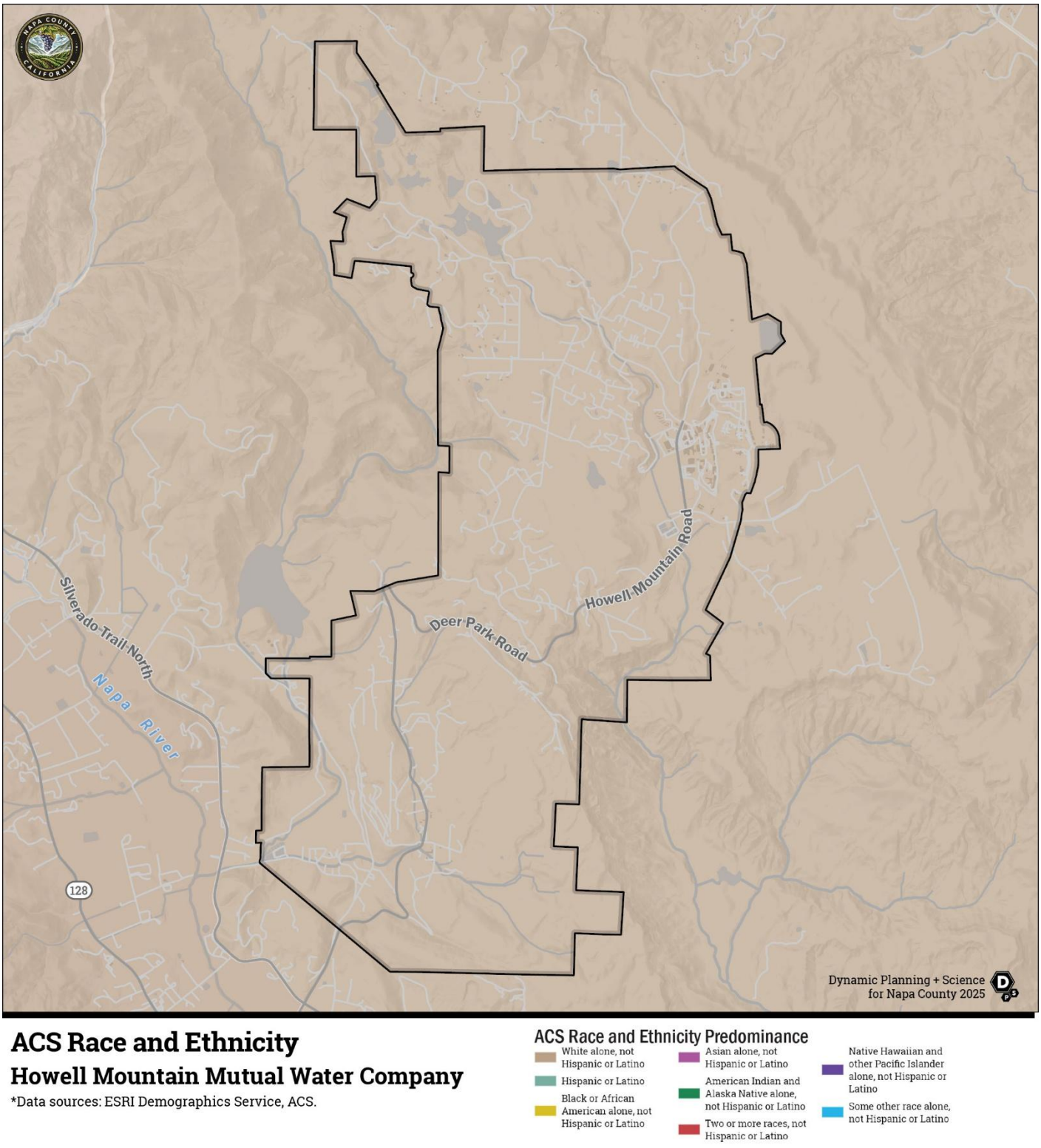


Figure 7-7: HMMWC Race and Ethnicity Map

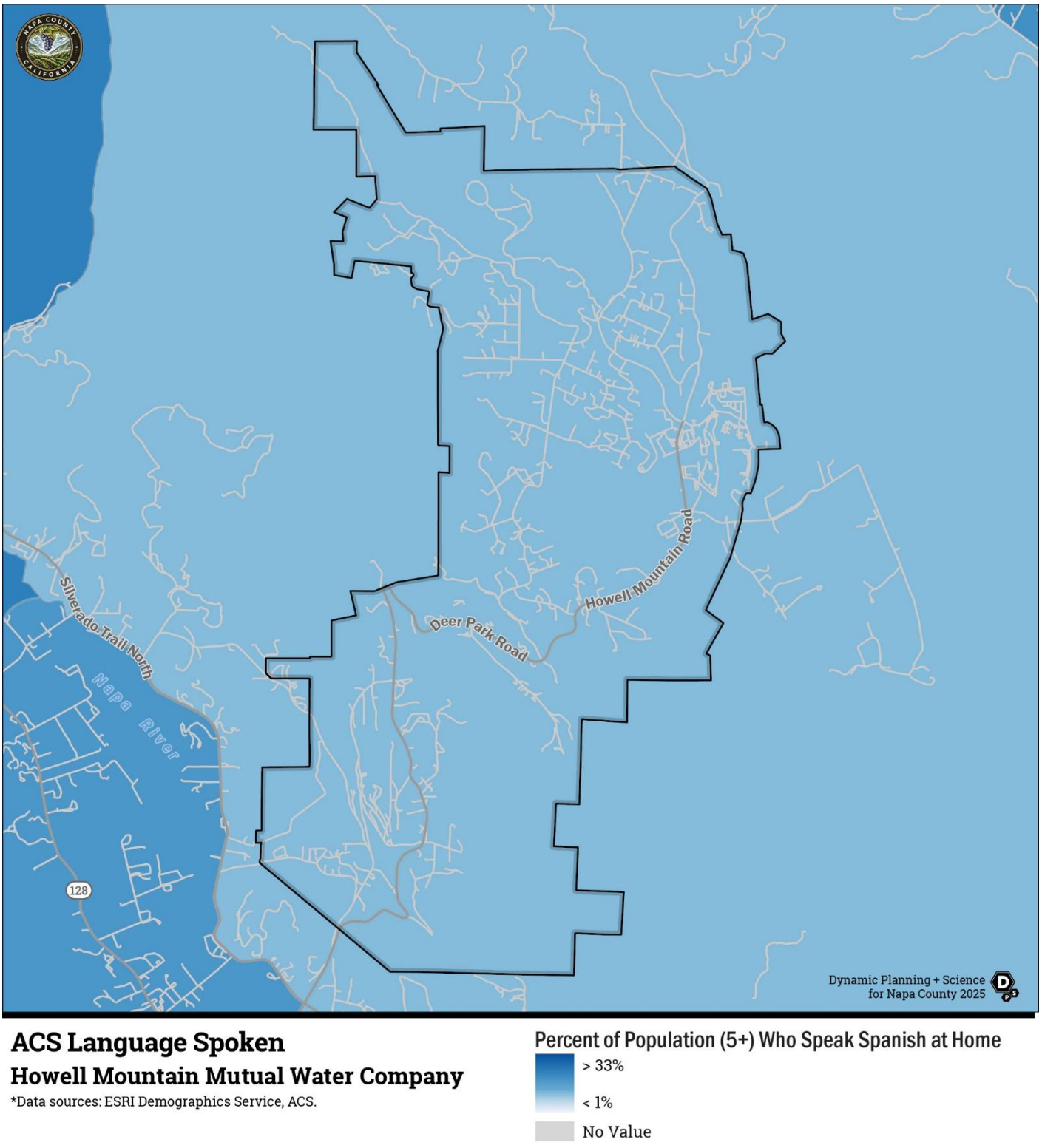


Figure 7-8: HMMWC Spanish-Speaking Households Map

7.2.2.4 Social Vulnerability Index (SVI)

The Centers for Disease Control and Prevention (CDC) Social Vulnerability Index (SVI) provides a composite measure of community characteristics that influence the ability of populations to prepare for, respond to, and recover from hazard events. The SVI incorporates multiple demographic and socioeconomic variables, including income, age, disability status, housing characteristics, minority status, and transportation access, to identify areas where residents may experience increased sensitivity to external stressors. Within the HMMWC service area, Figure 7-9 indicates generally low to moderate levels of social vulnerability across most of the service boundary.

The predominance of lower SVI values is consistent with other demographic indicators observed within the service area, including higher median household incomes, relatively low poverty rates, and high owner-occupancy levels. Lower social vulnerability scores often suggest increased household capacity to absorb certain economic shocks, access insurance mechanisms, and implement preparedness measures. However, social vulnerability is multifaceted, and lower composite scores do not eliminate hazard exposure or risk. In geographically constrained mountain communities, physical isolation, terrain-driven infrastructure limitations, and hazard intensity may offset aspects of socioeconomic capacity.

The HMMWC service area's rural mountain setting introduces vulnerability factors not fully captured by traditional socioeconomic indicators. Steep terrain, limited roadway connectivity, and dispersed development patterns can significantly influence emergency response, evacuation logistics, and post-disaster recovery. Even populations with comparatively higher incomes may face elevated risk due to wildfire exposure, infrastructure fragility, and limited redundancy in lifeline systems. The concentration of development within a wildland-urban interface environment further amplifies these considerations, as hazard events such as wildfire can produce widespread structural losses, prolonged displacement, and cascading service disruptions.

Social vulnerability within the service area is also influenced by the presence of dependent populations, elderly residents, and individuals with disabilities. While mapped disability and dependent age group percentages appear relatively low to moderate, these populations may still require targeted consideration during hazard events. Disruptions to potable water supply, power systems, or transportation networks may have disproportionate effects on individuals with access and functional needs. The interdependence of utility services and household resilience reinforces the importance of reliable water system operations.

Utility disruptions themselves represent a key component of community vulnerability. HMMWC functions as critical lifeline infrastructure supporting domestic water supply, sanitation, fire protection, and public health. Hazard events affecting water quality, storage capacity, treatment operations, or distribution reliability may produce consequences that extend beyond physical infrastructure damage. Water shortages, contamination events, or prolonged outages may affect household habitability, emergency response capabilities, and economic stability.

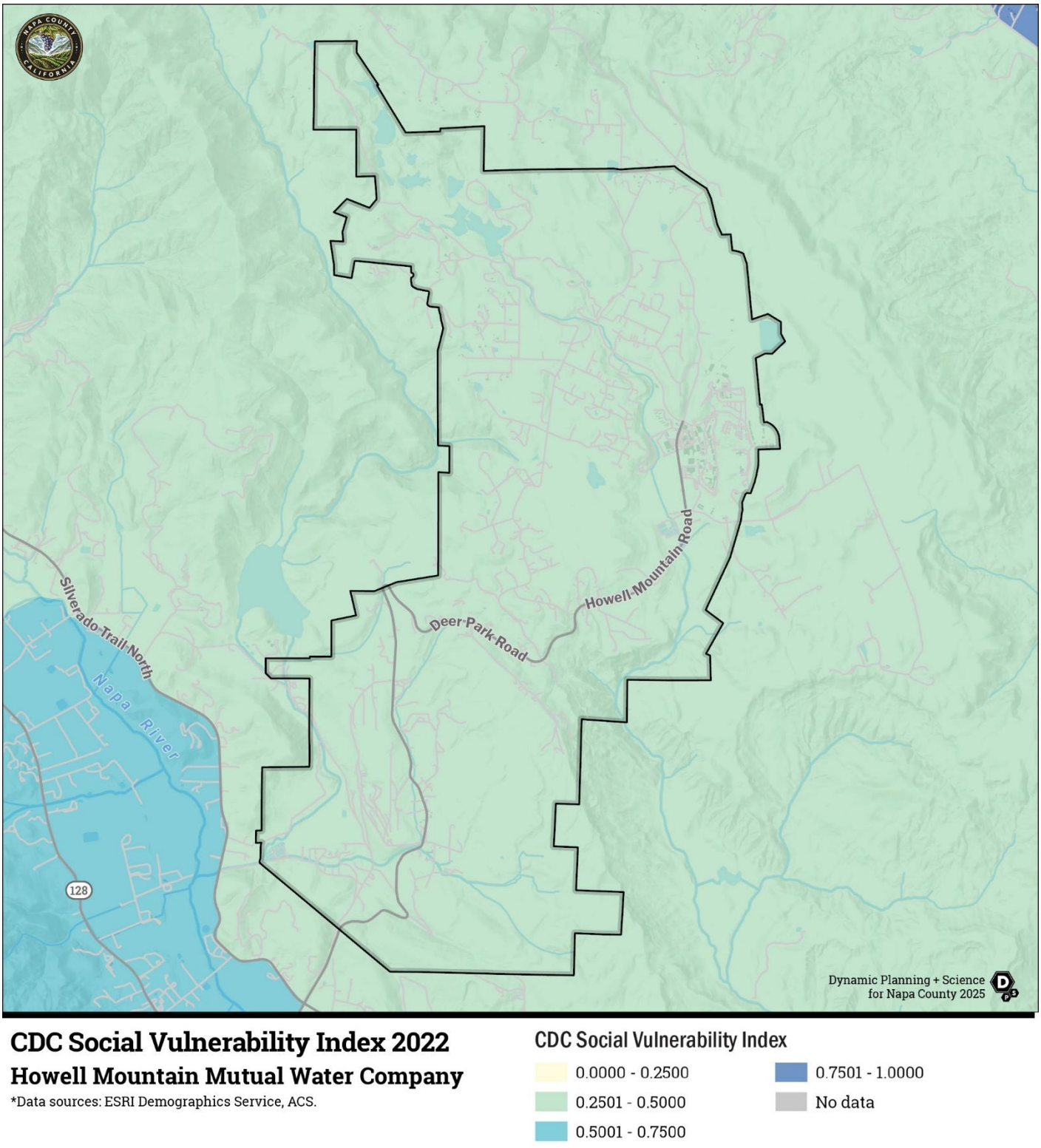


Figure 7-9: HMMWC CDC Social Vulnerability Index Map

7.2.3 Economy

The economy of the HMMWC service area is closely tied to its function as a rural, predominantly residential mountain community within Napa County. Unlike incorporated cities or urbanized districts, the local economy is not defined by concentrated commercial or industrial centers but rather by residential land uses, small-scale service activities, and employment patterns linked to the broader Napa County region. Many residents commute to employment centers located on the Napa Valley floor or in surrounding communities, reflecting the service area's role as a residential and institutional enclave rather than a primary employment hub.

Property ownership represents a central component of the local economic structure. Housing characteristics within the service area indicate high rates of owner-occupied residences, suggesting a community where wealth and financial stability are significantly influenced by real property assets. Residential property values, insurance coverage, and long-term investment in structures collectively shape household economic conditions. This ownership pattern also introduces substantial financial exposure to hazard events. Wildfire, earthquake, and landslide impacts may produce significant economic losses through structural damage, rebuilding costs, and prolonged displacement. Hazard-driven fluctuations in property values and insurance availability may therefore have pronounced effects on household financial stability.

The regional economy of Napa County exerts a strong influence on the HMMWC service population. Employment sectors commonly associated with Napa County include tourism, hospitality, agriculture, viticulture, professional services, education, healthcare, and local government. The Angwin area's institutional presence, including educational facilities, contributes to localized economic activity through employment, housing demand, and service needs. These institutional and commuter-based economic linkages underscore the interconnected nature of the service area with surrounding jurisdictions.

Household income indicators suggest that the service area generally reflects higher median income levels relative to many rural communities. Higher income characteristics may support greater capacity for property maintenance, insurance participation, and hazard mitigation investments. However, economic resilience varies among households. Fixed-income residents, retirees, and individuals facing insurance or rebuilding cost constraints may experience disproportionate impacts following hazard events. Even in higher-income communities, large-scale disasters such as wildfire can produce significant uninsured losses, extended reconstruction timelines, and economic uncertainty.

HMMWC itself functions as an economically critical entity within the community. As a member-owned mutual benefit corporation, the company's financial sustainability depends on rate structures, membership contributions, infrastructure maintenance, and regulatory compliance obligations. Utility operations require ongoing investment in treatment systems, reservoirs, pipelines, electrical infrastructure, and watershed management. Hazard events affecting infrastructure may generate repair costs, capital improvement demands, and revenue variability associated with service disruptions or changes in customer demand.

The economic consequences of utility disruptions are also an important consideration. Reliable potable water service supports residential occupancy, sanitation, fire suppression capability, and property protection. Interruptions to water supply or water quality may produce cascading economic effects, including temporary habitability challenges, increased emergency response costs, and potential impacts to insurance recovery processes. Water availability during wildfire events is particularly critical, as it directly supports firefighting operations and structural defense.

7.2.4 Growth Trends & Future Development

Growth patterns within the HMMWC service area are shaped primarily by the region's rural mountain setting, infrastructure constraints, and environmental conditions. Unlike urbanized areas experiencing rapid expansion, the HMMWC service boundary reflects development characteristics typical of low-density residential communities where growth occurs gradually and is closely tied to parcel-level construction, redevelopment, and property improvements. The mountainous terrain, limited roadway access, and presence of watershed lands collectively constrain large-scale development, resulting in relatively stable long-term population and housing trends.

Land use within the service area is predominantly residential, with development occurring on dispersed parcels situated within forested and WUI environments. Physical limitations associated with steep slopes, drainage corridors, and geologic conditions influence both the location and intensity of new construction. These geographic constraints naturally moderate development pressure, as buildable areas are limited, and infrastructure expansion often requires significant investment. As a result, future growth is expected to occur primarily through incremental infill, residential redevelopment, and improvements to existing properties rather than through concentrated subdivision activity.

Water supply availability represents a defining factor influencing future development potential. HMMWC's Drought and Water Shortage Contingency Plan explicitly recognizes that system capacity is governed by watershed storage conditions and raw water availability. The Plan establishes staged response measures linked to reservoir storage levels, emphasizing that water supply variability is an inherent operational consideration. In systems dependent on stored surface water, extended drought conditions may constrain new connections, intensify conservation requirements, and influence development feasibility. Water resource limitations therefore serve as both operational and planning determinants.

Connection policies further illustrate the relationship between system capacity and development. The Consumer Water Connection Guidance outlines procedures for obtaining new water service, noting that feasibility determinations are required and that properties located far from existing mains may incur additional costs. These requirements reflect the practical constraints associated with extending infrastructure in mountainous environments. System expansion decisions must balance hydraulic capacity, treatment capability, storage adequacy, and long-term operational sustainability.

Hazard exposure also influences growth dynamics within the service area. The Howell Mountain region is subject to elevated wildfire risk, periodic drought conditions, seismic hazards, and localized slope

instability. Past wildfire events, including the Glass Fire, have demonstrated the potential for structural losses and long-term displacement within the community. Hazard-related rebuilding and redevelopment may therefore represent a more significant driver of construction activity than net-new growth. Recovery processes following hazard events often involve code compliance upgrades, defensible space improvements, and infrastructure reinvestment, all of which shape development trajectories.

Future development patterns are expected to remain consistent with existing land use characteristics, with continued emphasis on residential occupancy, property maintenance, and incremental improvements. While regional housing pressures within Napa County may influence long-term demand, geographic constraints, water supply variability, and hazard exposure collectively moderate large-scale expansion potential. Infrastructure resilience, water reliability, and hazard mitigation investments will remain critical factors supporting both existing development and future growth.

7.3 Planning Process

HMMWC followed the planning process detailed in Volume 1, Section 2, including participating in the county-wide Hazard Mitigation Planning Team (HMPT) and formulating their own internal planning team to support the broader planning process.

The district's representatives in the Steering Group led stakeholder and public engagement efforts alongside the Consultant Team, with assistance from the county-wide HMPT and their internal planning team. This engagement process is described in Volume 1. Specifically, for the district, this included postings to the district website and social media, and outreach events, as documented in Appendix B. Examples of Key Stakeholders engaged by Napa County on behalf of the district with relevance to the development of HMMWC's mitigation strategy include the USDA and other federal agencies; CAL FIRE and other state agencies; other jurisdictions; community-based organizations such as local Chamber of Commerce chapters; utility providers like PG&E; UC Davis and other academia; and local businesses.

All Key Stakeholders that were invited to participate in the planning process are listed in Volume 1, Section 2, and the input received from stakeholders was integrated into the district's annex, as described in Volume 1 Table 2-9. The district's internal planning team participants, their positions, and how they participated in the planning process are shown in Table 7-1.

Table 7-1: HMMWC Planning Team and Steering Group Members

Team Members	Title	Description of Involvement
Shannon Damonte	Administrative Manager	Lead Point-of-Contact, HMPT #1, #2, #4, BO #1 and #2
Tanner Hiers	General Manager	Alternate Point-of-Contact, HMPT #1, #2

HMMWC staff participated in a comprehensive hazard mitigation planning process as part of the 2026 Napa County MJHMP update. This included a series of breakout meetings, listed in Table 7-2 that engaged the district's planning team, which included key district personnel and stakeholders in evaluating hazards, identifying local vulnerabilities, and prioritizing mitigation strategies

The process began with a County-Wide Steering Group Kickoff Meeting on February 28, 2024. This initial meeting focused on welcoming participants, establishing a shared understanding of the project scope and schedule, clarifying roles and responsibilities of the Steering Group, the county-wide Hazard Mitigation Planning Team (HMPT), and individual jurisdictional planning teams, and included a review of key changes since the 2020 Local Hazard Mitigation Plan The meeting set the foundation for coordinated participation throughout the planning effort.

On December 10, 2025, participants engaged in a hexagon mapping activity designed to visually identify mitigation actions that could benefit from or require inter-jurisdictional coordination. These collaborative efforts helped shape a refined set of mitigation alternatives, establish shared planning goals, and align local strategies with FEMA's Hazard Mitigation Assistance (HMA) funding framework.

Throughout the series of breakout meetings, the district engaged in a structured and collaborative planning process focused on assessing hazard risks, identifying vulnerabilities, and developing targeted mitigation strategies. The meetings began with recaps of the county-wide HMPT meetings to ensure alignment of goals and progress.

During the September 10, 2024 breakout out meeting, discussions concentrated on community engagement outcomes, initial risk assessments, and the integration of demographic data to better understand vulnerable populations. Jurisdictional teams reviewed their specific hazard exposures using the Risk Assessment Mapping Platform (RAMP) and participated in prioritization exercises to identify their top hazards.

The June 3, 2025, breakout meeting shifted toward reviewing local capabilities and defining specific areas of concern, which informed the drafting of problem statements. Teams worked collaboratively to refine mitigation alternatives, align actions with FEMA guidelines, and develop a shortlist of priority mitigation actions and inter-jurisdictional collaboration opportunities.

The meetings also included consensus-building activities around hazard rankings, capabilities, and planned actions, while providing regular updates on the overall project schedule.

Table 7-2: HMMWC Planning Team Meetings

Meeting & Date	Agenda / Topics	Goals / Key Inputs
County-Wide Steering Group and HMPT Kick-off and Meetings #1 & #2 February 28, 2024– July 18, 2024		
HMMWC Planning Team Breakout Meeting #1 September 10, 2024	▪ County-wide HMPT meetings #1 and #2 recaps ▪ Community engagement progress and results ▪ Risk assessment and community vulnerability ▪ Demographics and vulnerable populations ▪ Overview of jurisdiction-specific hazard risks and exposure ▪ Introduction to Risk Assessment Mapping Platform (RAMP) ▪ Jurisdiction-specific hazard risk ranking exercise ▪ Project schedule updates and next steps	▪ Consensus on jurisdiction-specific priority hazards ▪ Identify capabilities and potential mitigation actions ▪ Community engagement volunteers
County-Wide HMPT Meeting #3 March 25, 2025		
HMMWC Planning Team Breakout Meeting #2 June 3, 2025	▪ Breakout Meeting #1 and HMPT #3 recaps ▪ Review capabilities assessment ▪ Review areas of concern and define problem statements ▪ Principles of effective mitigation strategies and actions, and mitigation alternatives ▪ Refine and align jurisdiction-specific mitigation actions exercise ▪ Project schedule updates and next steps	▪ Consensus on jurisdiction-specific capabilities ▪ Consensus on jurisdiction-specific areas of concern ▪ Consensus on priority mitigation actions and collaboration opportunities ▪ Community engagement volunteers
County-Wide HMPT Meeting #4 December 10, 2025		

7.3.1 Public Input & Draft Review

As detailed in Volume 1, Section 2, the draft plan was available for public review and comment from May 15 to June 2, 2026. Public comments received during that time were similar to those gathered throughout the public engagement process, including the need for more equity in the distribution of mitigation activities and funding and the need for enhanced cooperation among jurisdictions, utility providers, and state agencies. These comments were incorporated into the city's mitigation strategy, as appropriate; although, most were already addressed by the Mitigation Action Plan which was based on previous public input.

Public and stakeholder input was gathered and incorporated throughout the plan development process, before the public review period, such as from the online public survey (see Volume 1, Section 2.1.2 and Appendix B, for details). During the review period, jurisdictional staff and stakeholders that participated in the plan development also reviewed the public draft and provided comments on minor corrections and revisions, which were addressed in the final plan.

7.4 What's New

This section provides an overview of hazard mitigation planning efforts for the planning area and highlights the updates made in the 2026 MJHMP. HMMWC previously participated in and maintained a Hazard Mitigation Plan, which guided resilience planning and hazard mitigation actions at the district level. HMMWC is updating their current plan on a county wide level. This integration reflects the district's ongoing commitment to regional resilience and acknowledges that many hazards such as coastal flooding, severe storms, and earthquakes cross jurisdictional boundaries.

Through participation in the MJHMP, HMMWC has identified its highest priority hazards, developed hazard specific problem statements, and proposed actionable strategies to reduce risks. By aligning with countywide partners and leveraging regional resources, HMMWC has strengthened its capacity to prepare for, withstand, and recover from disasters while continuing to protect its unique coastal community character.

7.4.1 Mitigation Activities

HMMWC has implemented and continues to pursue a range of mitigation activities designed to reduce system vulnerability, enhance infrastructure reliability, and improve resilience to natural hazards. As a small, watershed-dependent utility operating within a hazard-prone mountain environment, mitigation planning is closely integrated with routine operations, capital improvements, and long-term resource management strategies. These efforts reflect both regulatory requirements and operational necessities, given the system's exposure to drought, wildfire, seismic hazards, and terrain-related risks.

Water supply management represents a central component of HMMWC's mitigation framework. The adopted Drought and Water Shortage Contingency Plan establishes a structured response system tied to raw water storage capacity, allowing the company to proactively manage water demand during periods of reduced supply. The Plan defines staged conservation measures triggered by declining reservoir levels, thereby reducing the likelihood of severe shortages and supporting system stability under drought conditions. This staged approach functions as both an operational control mechanism and a hazard mitigation strategy, addressing one of the most persistent climate-related risks affecting the region.

Wildfire risk reduction and watershed management activities are also integral to HMMWC's mitigation strategy. HMMWC performs ongoing vegetation management efforts within company-owned watershed lands, including tree removal, fuel reduction, and coordination with specialized crews. These measures are designed to reduce wildfire intensity, limit infrastructure exposure, and protect source water quality. Wildfire mitigation within watershed areas is particularly important, as post-fire conditions can significantly degrade raw water quality through increased sedimentation, ash transport, and altered runoff dynamics.

Administrative and policy-based mitigation activities complement physical infrastructure improvements. The Water Rate Plan and Company Policies establish mechanisms that support financial stability, conservation behavior, and system sustainability. Financial resilience is a key component of hazard

mitigation for small utilities, as adequate revenue streams and reserve capacity enable timely repairs, capital investments, and emergency response actions. Conservation-oriented policies further reduce stress on limited water supplies during drought and peak demand periods.

Collectively, HMMWC's mitigation activities demonstrate a comprehensive approach that integrates water supply management, infrastructure investment, watershed protection, water quality control, and financial planning. These efforts reduce system vulnerability, improve operational reliability, and enhance the company's capacity to withstand and recover from hazard events. Continued mitigation investment will remain essential given the region's evolving climate conditions, persistent wildfire exposure, and infrastructure aging considerations.

7.4.2 Mitigation Successes

Water Tank Replacement

As part of ongoing infrastructure resilience and water system reliability improvements, HMMWC designed and inspected a new 500,000-gallon treated water storage tank. The project addressed long-standing deficiencies associated with the existing underground concrete storage tank, which had experienced chronic leakage that compromised both water quantity and water quality. Persistent water loss reduced effective storage capacity and increased operational strain on the system, while aging infrastructure contributed to elevated risks of contamination.

The newly constructed tank and associated piping system replaced the deteriorated concrete facility, improving system integrity, reducing leakage, and enhancing treated water storage reliability. The upgraded design also reduced water quality concerns associated with organics and chlorine interactions, thereby supporting regulatory compliance and public health protection. Although the original master plan contemplated installation of two 500,000-gallon tanks, construction-phase discoveries revealed that leakage within the legacy tank and piping network was substantially higher than previously documented. Following system repairs and loss reduction, daily water loss declined to levels that allowed elimination of the second tank, resulting in cost efficiencies while maintaining adequate storage capacity.

The new 500,000-gallon treated water tank is now fully operational and serves as a critical component of the water company's distribution system. By replacing storage infrastructure that was more than fifty years old, the project significantly reduced system vulnerability, improved operational reliability, and enhanced resilience to hazards including drought, wildfire, seismic events, and emergency demand conditions.

Vegetation Management

Board meeting records document ongoing vegetation management activities conducted within HMMWC's watershed properties. These efforts include systematic tree removal, thinning of hazardous vegetation, and fuel reduction work performed in coordination with specialized contractors and forestry crews. Such activities are essential within heavily forested mountain environments, where accumulated fuels, ladder

vegetation, and drought-stressed trees can significantly increase wildfire intensity and fire spread potential.

Vegetation management within company-owned watershed lands serves multiple risk-reduction objectives. By reducing fuel loading and modifying fire behavior characteristics, these measures decrease the likelihood of high-severity wildfire impacts that could damage reservoirs, storage facilities, treatment infrastructure, and distribution assets. Fuel reduction also supports firefighter access and improves defensibility of critical water system components during wildfire events. In addition to protecting physical infrastructure, watershed vegetation management plays a critical role in safeguarding source water reliability.

Wildfire mitigation within watershed areas is particularly important because post-fire environmental conditions can produce substantial secondary impacts to water systems. High-severity burn areas often experience increased erosion, destabilized soils, and altered hydrologic responses, leading to elevated sediment transport, ash deposition, and organic loading in surface water sources. These changes may degrade raw water quality, increase treatment complexity, and strain system operations. Ash, debris, and nutrient influx following wildfire events can also contribute to disinfection byproduct formation and other water quality challenges. Proactive vegetation management therefore functions as both an infrastructure protection strategy and a source water quality mitigation measure, enhancing the overall resilience of the water supply system.

Deer Park Pipeline Replacement

The Deer Park Pipeline Replacement Project, supported in part by FEMA and CalOES funding, exemplifies resilience-oriented infrastructure improvements. Pipeline replacement initiatives reduce the probability of system failures associated with aging materials, seismic stresses, ground movement, and wildfire-related damage. Such projects enhance both operational continuity and emergency response capability.

7.5 Risk Assessment

This section focuses on profiling hazards specific to HMMWC and assessing their vulnerability independent of the broader county-wide planning area, which has been evaluated in Section 3 of Volume 1. The hazard profiles in Volume 1 discuss overall impacts to the planning area and describe relevant plans, policies, and regulations; past events; location; frequency and probability of future occurrences; severity and extent; warning time; secondary hazards; and climate change impacts. For more information on risk assessment methodologies, see Volume 1, Appendix A.

This section includes a tailored vulnerability assessment, analyzing assets at risk such as population, property, and critical facilities and infrastructure unique to the district, and information on district-specific differences in hazard vulnerability across the planning area. It also identifies total district assets at risk, including people, property, and critical facilities and infrastructure within the district. In addition, this section presents growth and development trends for the community, offering insights into vulnerabilities and risks that represent the broader context of assets at risk.

7.5.1 Hazard Screening & Prioritization

Members of the Planning Team from each participating jurisdiction came together to collaboratively decide which county-wide hazards would be included in the MJHMP, and which would be excluded. Hazard screening and prioritization took place early in the process and integrated historic data, local knowledge, and consensus opinions to create a risk assessment matrix for the county as well as for each participating jurisdiction. These matrices indicate the priority of hazards prior to further refinement. Details about this process, the results of the discussion, and in-depth profiles for county-wide hazards can be found in Volume 1, Sections 2 and 3.

HMMWC's internal planning group used the same hazard identification and prioritization process as the county-wide Planning Team. They reviewed previously prepared hazard mitigation plans and other relevant documents to determine the realm of natural hazards that have the potential to affect the district. Table 7-3 provides a crosswalk of hazards identified in select planning documents, including the 2020 Napa County MJHMP, 2020 HMMWC HMP, 2022 Climate Change Adaptation Plan and the 2023 State of California HMP. The crosswalk was used to develop a preliminary hazards list, providing a framework for the group to evaluate which hazards were truly relevant to HMMWC and which ones were not.

The internal planning group then ranked hazards based on their probability of affecting HMMWC and potential impacts on the community. Figure 7-10 displays the results of the hazard risk ranking exercise that was performed before further refinement. All hazards have been profiled in Volume 1 of this document. The purpose of this annex is to specifically address the district's vulnerability to specifically identified hazards.

Table 7-3: HMMWC Document Review of Potential Hazards

Hazard	2020 Napa County MJHMP	2020 HMMWC HMP	2023 California SHMP
Agricultural Pests	■		■
Avalanche			■
Climate Change	■		■
Coastal			■
Dam Failure	■	■	■
Drought	■	■	■
Earthquake / Liquefaction	■	■	■
Extreme Cold		■	■
Extreme Heat		■	■
Extreme Weather / Storms	■	■	■
Flood	■	■	■
Geologic / Mass Movement	■		■
Human-Caused			■
Insects			■
Levee Failure			■
Pandemic Disease	■		■
Sea Level Rise			■
Soil			■
Subsidence			■
Tornado			■
Tsunami / Seiche Wave			■
Volcano			■
Wildfire	■	■	■

Risk Assessment Matrix Definitions

PROBABILITY RATING

The likelihood of a hazard event occurring within a time period?

PROBABILITY

- **Highly Likely** - 100% annual probability. Or Likely to occur every year in your lifetime.
- **Likely** - between 10 & 100% annual probability. Or will occur several times in your lifetime.
- **Possible** - between 1 & 10% annual probability. Or Likely to occur some time in your lifetime.
- **Unlikely** - less than 1% annual probability. Or unlikely but possible to occur in your lifetime.

IMPACT RATING

In terms of injuries, damage, or death, would you anticipate impacts to be minor, limited, critical, or catastrophic when a significant hazard event occurs? The impact could be in terms of one hazard event (flooding from a culvert failure) or a large-scale event (multiple rivers flooding) in the same jurisdictional boundary.

IMPACT

Minor	Limited	Critical	Catastrophic

Minor - very few injuries, if any. Only minor property damage & minimal disruption on quality of life. Temporary shutdown of critical facilities.

Limited - minor injuries only. Approx. 10% or less of property in disaster footprint damaged or destroyed. Complete shutdown of critical facilities for more than one day.

Critical - multiple deaths/injuries possible. Between 25% and 50% of property in disaster footprint is damaged or destroyed. Complete shutdown of critical facilities for more than one week.

Catastrophic - high number of deaths/injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for 30 days or more.

To concentrate resources, the jurisdictional planning team will focus on "High" and "Extreme" risk hazards, and "Medium" risk hazards to a lesser extent. These hazards have the higher probability and greater impact as it relates to the jurisdictions planning area.

Hazard definitions are included in **Vol. 1** of this plan. Some hazards are discussed as subset hazards— e.g., "Levee Failure" within the "Flood" hazard profile. If a hazard is not present on the risk matrix, is grey, or categorized as a "Low" risk hazard, the jurisdictional planning team felt the hazard had a minimal footprint or impact within their planning area and chose not to profile the hazard.

Hazard Information / Legend:

CLIMATE CHANGE

Climate Change impacts will be addressed within each relevant hazard section within the plan update and as a stand alone section for each jurisdiction. Climate change may change the frequency, duration, or intensity of other hazards profiled.

Howell Mountain Mutual Water Company Risk Matrix

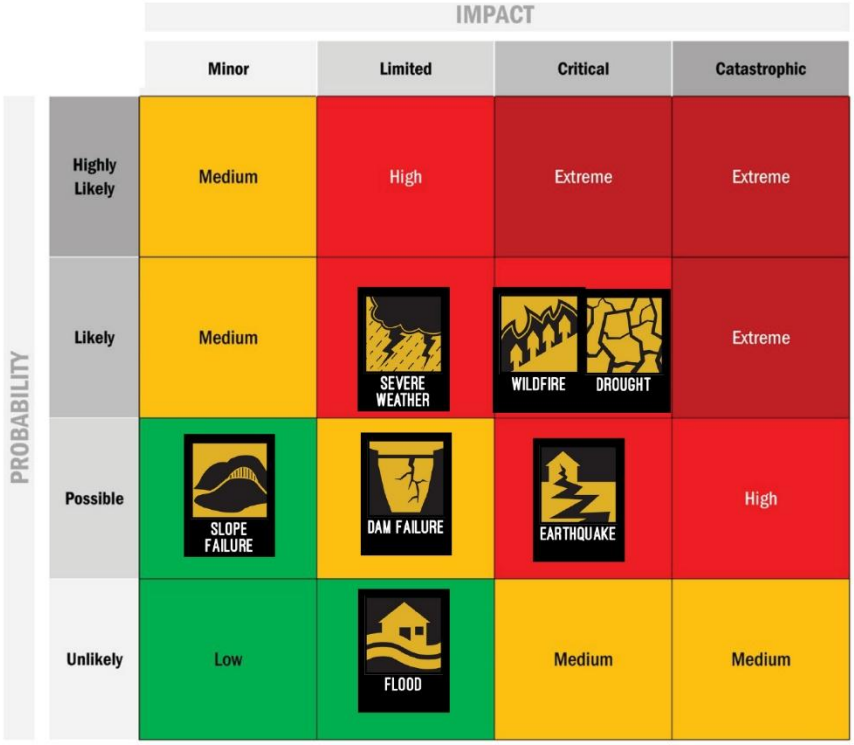


Figure 7-10: HMMWC Risk Assessment Matrix

Note: Hazard naming in the Risk Assessment Matrix may not match the final naming used. Refer to hazards prioritization summary table.

Priority Hazards

The results of the initial risk ranking exercise completed by the district's Planning Team, before further refinement, are identified in the county's completed matrix in Figure 7-10. Table 7-4 provides the final list of priority hazards and subhazards with additional details about why certain hazards were chosen and why others were not prioritized. However, it should be noted that many hazards not prioritized for profiling are briefly discussed as secondary or compounding hazards, and subhazards that were profiled and included in the risk assessment are listed specifically.

Table 7-4: HMMWC Hazards Prioritization Summary

Hazard	Priority	Explanation
Earthquake / Liquefaction	**High**	**Profiled in Volume 1, Section 3.3.4, and Section 7.5.2.3 in this annex** (not including Liquefaction due to low probability and impact potential)
Wildfire	**High**	**Profiled in Volume 1, Section 3.3.1, and Section 7.5.2.1 in this annex**
Flood	-	Profiled in Volume 1, Section 3.3.2; not a priority due to low probability and impact potential
Levee Failure	-	Profiled in Volume 1, Section 3.3.2; not a priority due to low probability and impact potential
Extreme Weather / Storms	**High**	**Profiled in Volume 1, Section 3.3.5, and Section 7.5.2.5 in this annex as Severe Weather, including High Wind and Heavy Rain** (Winter Weather not a priority due to low probability and impact potential)
Drought	**High**	**Profiled in Volume 1, Section 3.3.6, and Section 7.5.2.4 in this annex**
Geologic / Mass Movement	-	Profiled in Volume 1, Section 3.3.5; not a priority due to low probability and impact potential
Extreme Heat	-	Profiled in Volume 1, Section 3.3.8; not a priority due to being outside jurisdictional mission and authority
Agricultural Pests	-	Profiled in Volume 1, Section 3.3.9; not a priority due to being outside jurisdictional mission and authority
Sea Level Rise	-	Profiled in Volume 1, Section 3.3.9; not a priority due to low probability and impact potential
Climate Change	**Medium**	**Profiled in Volume 1, Section 3.3.9, and Section 7.5.2.6 in this annex** and discussed as a compounding hazard in relevant profiles
Dam Failure	**Medium**	**Profiled in Volume 1, Section 3.3.3, and Section 7.5.2.2 in this annex**

7.5.2 Vulnerability to Specific Hazards

Assessing vulnerabilities exposes the unique characteristics of individual hazards and begins the process of narrowing down which areas within the district are vulnerable to specific hazard events. The vulnerability assessment considered unique local knowledge of hazards and impacts and a GIS overlaying method for examining such vulnerabilities in more depth. Using these methods, the district's planning group estimated vulnerable populations, properties, and assets, and potential losses. In addition, the exposure of district assets to drought, earthquake, wildfire, flood, and climate change hazards were also considered.

Many of the hazard profiles include a snapshot map and damage estimation tables that illustrate the district's vulnerabilities to those specific hazards. These maps assisted the planning group in understanding the hazard exposure of populations, parcels, and critical facilities and infrastructure. Each snapshot map contains an exposure summary that displays the percentage of the population, the improvement and content value of parcels, and the amount of critical infrastructure that is exposed. For hazards without geospatial extents, such as drought and severe weather, narratives are provided instead of exposure maps and tables.

Based on the hazard prioritization exercise, this vulnerability assessment focuses on six hazards for the HMMWC, some of which encompass subhazards such as Heavy Rain.

Wildfire
SECTION 7.5.2.1



Dam Failure
SECTION 7.5.2.2



Earthquake
SECTION 7.5.2.3



Drought
SECTION 7.5.2.4



Severe Weather
SECTION 7.5.2.5



Climate Change
SECTION 7.5.2.6



7.5.2.1 Wildfire Hazard

Wildfire represents one of the most significant hazards affecting the HMMWC service area. The company operates within a heavily vegetated, mountainous environment characterized by forested lands, steep terrain, and development patterns typical of the WUI. These physical conditions, combined with seasonal climate patterns marked by hot, dry summers and periodic wind events, create an environment highly conducive to wildfire ignition and rapid-fire spread.

Figure 7-11 indicates that the majority of the HMMWC service area is classified within very high wildfire risk zones, consistent with regional hazard designations for Napa County. Exposure metrics demonstrate that approximately 847 residents, representing roughly 52 percent of the mapped population, are located within the wildfire hazard area. Similarly, approximately 740 parcels, or 54 percent of the mapped parcels, fall within wildfire exposure zones. The concentration of residential development within high-risk wildfire areas underscores the direct relationship between hazard exposure, housing vulnerability, and utility system risk.

Wildfire hazards present both direct and indirect risks to HMMWC operations. Direct impacts may include damage to reservoirs, storage tanks, treatment facilities, pump stations, electrical infrastructure, and distribution pipelines. Wildfire events can also disrupt access routes, delay maintenance activities, and hinder emergency repair operations. Extended power outages, which frequently accompany wildfire events or Public Safety Power Shutoff (PSPS) actions, may further affect treatment and pumping capabilities, placing additional strain on system reliability.

Indirect wildfire impacts may be equally consequential. Post-fire watershed conditions often produce elevated erosion rates, destabilized soils, and altered hydrologic responses. These environmental changes can result in increased sedimentation, ash transport, organic loading, and contaminant introduction into raw water sources. Degradation of source water quality may increase treatment complexity, elevate operational costs, and challenge regulatory compliance. Secondary effects such as debris flows, slope failures, and flooding may also occur following high-severity burn events, compounding infrastructure vulnerability.

The economic exposure associated with wildfire hazards is substantial. The snapshot map indicates that parcels within the wildfire hazard area represent hundreds of millions of dollars in total assessed value, reflecting the significant financial consequences associated with structural losses and infrastructure damage. Wildfire events may therefore produce cascading impacts affecting property values, insurance availability, reconstruction timelines, and community stability.

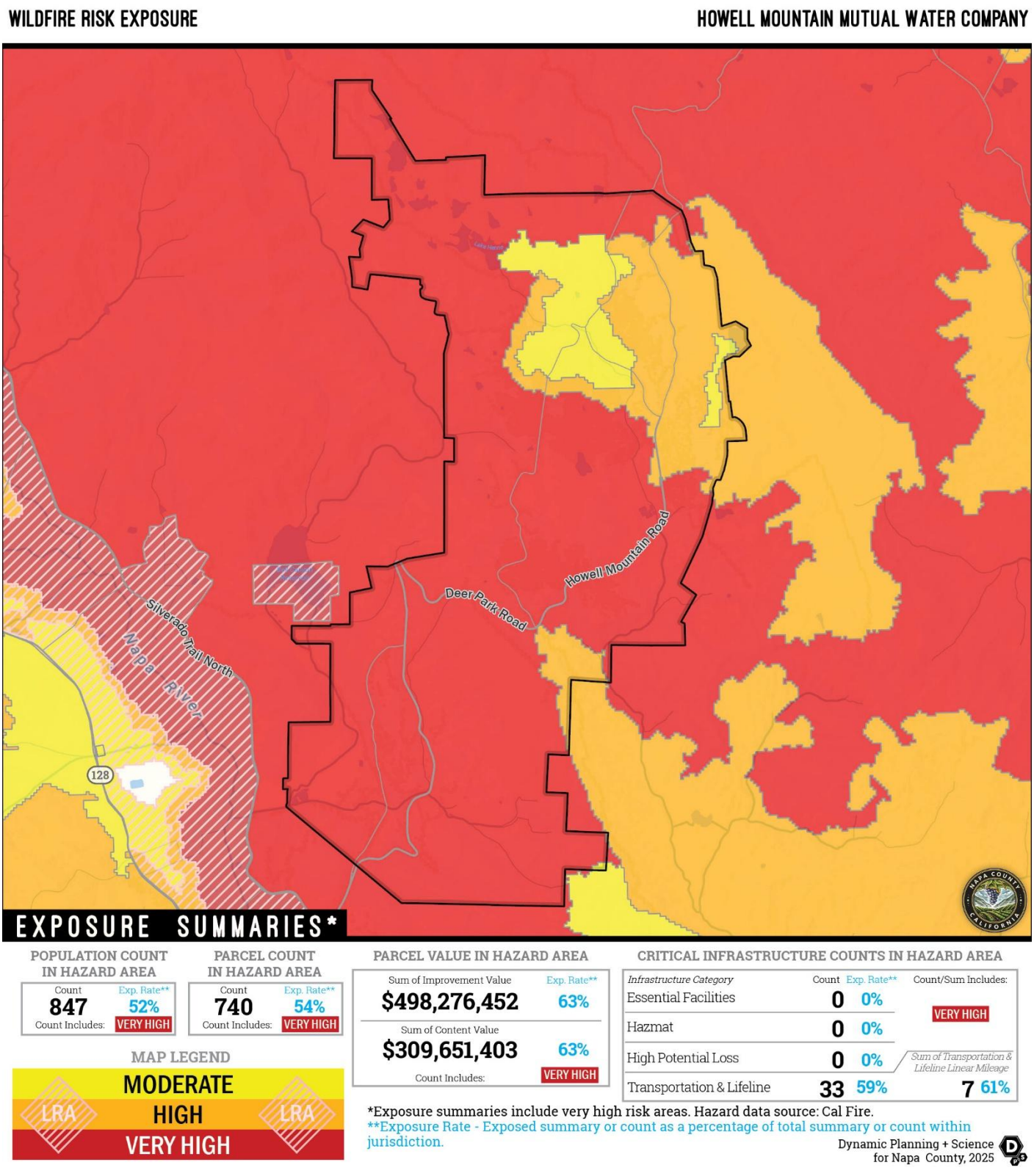


Figure 7-11: Exposure Summary – HMMWC Wildfire Risk

7.5.2.2 Dam Failure Hazard

Dam failure represents a low-frequency but potentially high-consequence hazard within the HMMWC service area. Dam failure refers to the partial or complete structural failure of an upstream dam, resulting in the uncontrolled release of stored water. Figure 7-12 indicates that limited portions of the service boundary fall within mapped dam inundation zones. Exposure metrics identify approximately 89 residents, representing roughly 6 percent of the mapped population, and 65 parcels, or approximately 5 percent of parcels, as located within potential inundation areas. While the overall exposure footprint is comparatively small relative to other hazards, dam failure scenarios warrant consideration due to their rapid onset characteristics and potential severity.

Dam failure hazards are typically associated with structural failure, overtopping, seismic impacts, internal erosion, extreme precipitation events, or operational malfunctions affecting reservoir containment systems. In mountainous environments such as Howell Mountain, failure scenarios may produce sudden downstream flooding, high-velocity flow conditions, debris transport, and localized erosion. The steep terrain and confined drainage corridors characteristic of the region can amplify flow velocities and reduce warning times, increasing the potential for infrastructure damage and life safety risks.

Potential dam failure impacts within the HMMWC service area primarily relate to downstream flooding and associated secondary effects. Sudden inundation may damage residential structures, roadways, utility infrastructure, and distribution system components located within flood pathways. Floodwaters may also transport sediment, debris, and contaminants that affect water quality and treatment operations. Access routes critical for emergency response and infrastructure repair may be disrupted or rendered impassable.

Seismic hazards represent a particularly relevant consideration for dam failure risk. Earthquake events may induce structural stress, foundation instability, or embankment damage affecting reservoir systems. Given the region's known seismic exposure, dam safety considerations are closely linked to broader geologic hazard planning. Extreme weather events, including intense rainfall or prolonged storm activity, may also influence reservoir performance through increased inflows, slope saturation, and erosion processes.

Although the mapped exposure rates for dam inundation are relatively low, the economic implications may be significant at the parcel level. Structures located within inundation zones may face elevated risk of damage, financial loss, and prolonged recovery timelines following a failure event. The Dam Inundation Exposure snapshot indicates tens of millions of dollars in parcel value within the hazard area, illustrating the potential economic consequences of a low-probability but high-impact scenario.

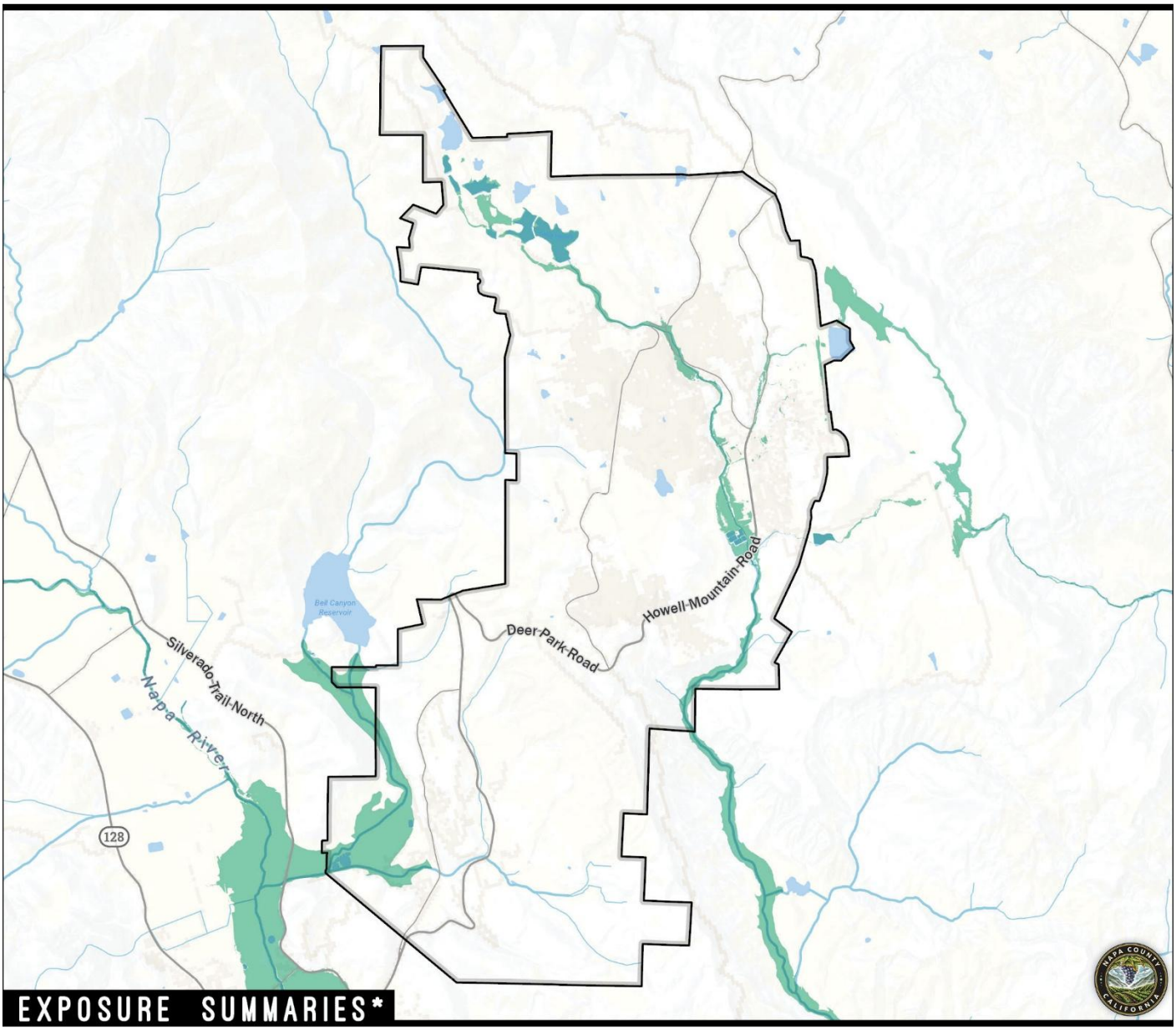
Dam safety oversight, inspection, and emergency action planning are managed at the state and regional levels, including by the California Department of Water Resources and the California Division of Safety of Dams. These agencies work with dam owners and local jurisdictions to monitor dam conditions and coordinate emergency notification procedures.

For HMMWC, dam failure hazards also intersect with operational considerations. Reservoir integrity is fundamental to raw water storage, treatment reliability, and distribution continuity. Structural compromise

of storage facilities may reduce system capacity, disrupt service delivery, and necessitate emergency repairs. Secondary effects such as sedimentation, contamination, or infrastructure access constraints may further affect system performance.

DAM INUNDATION EXPOSURE

HOWELL MOUNTAIN MUTUAL WATER COMPANY



EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA

Count	Exp. Rate**	Count Includes:
89	6%	INUNDATION

PARCEL COUNT IN HAZARD AREA

Count	Exp. Rate**	Count Includes:
65	5%	INUNDATION

PARCEL VALUE IN HAZARD AREA

	Exp. Rate**	Count Includes:
Sum of Improvement Value $44,283,876	6%	
Sum of Content Value $29,192,648	6%	INUNDATION

CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA

Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
Essential Facilities	0	0%	INUNDATION
Hazmat	0	0%	
High Potential Loss	0	0%	Sum of Transportation & Lifeline Linear Mileage
Transportation & Lifeline	4	7%	1 6%

MAP LEGEND

INUNDATION ZONE

*Exposure summaries include dam inundation areas. Hazard data source: DWR.
**Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

Dynamic Planning + Science for Napa County, 2025

Figure 7-12: Exposure Summary – HMMWC Dam Failure Risk

7.5.2.3 Earthquake Hazard

Earthquake hazards represent a persistent and regionally significant risk factor for the HMMWC service area. Napa County is located within one of California's most seismically active regions, influenced by multiple fault systems capable of generating moderate to strong ground shaking. The mountainous terrain, dispersed development pattern, and infrastructure dependencies characteristic of the Howell Mountain area introduce specific vulnerabilities associated with seismic events.

The earthquake exposure snapshot maps illustrate the range of potential shaking intensities under modeled seismic scenarios. The Hunting Creek – Berryessa Earthquake Scenario (M7.1), Figure 7-13, indicates that substantial portions of the HMMWC service area may experience strong to very strong shaking intensities, corresponding to Modified Mercalli Intensity (MMI) levels VII and VIII. Exposure estimates associated with this scenario identify approximately 329 residents, representing roughly 20 percent of the mapped population, and 221 parcels, or approximately 16 percent of parcels, within higher shaking intensity zones. The modeled parcel value exposure exceeding $100 million underscores the potential economic consequences of a significant regional seismic event.

By contrast, the West Napa Earthquake Scenario (M6.7), Figure 7-14, indicates minimal direct exposure within the HMMWC service boundary. This variation reflects the influence of epicenter location, fault geometry, and attenuation effects on localized shaking intensities. Although scenario-specific exposure may vary, the broader seismic risk environment for Napa County remains substantial, with the potential for damaging ground motion affecting utility infrastructure and community assets.

Earthquake hazards pose both direct and cascading risks to HMMWC operations. Strong ground shaking may result in structural damage to storage tanks, reservoirs, pump stations, treatment components, and ancillary facilities. Buried distribution pipelines may be susceptible to joint failure, ground displacement effects, differential settlement, or slope-related stresses. Electrical systems, telemetry equipment, and mechanical components may also be disrupted, potentially affecting system monitoring and operational control.

Secondary hazards associated with earthquakes are particularly relevant within mountainous environments. Ground shaking may trigger slope failures, landslides, rockfalls, and soil instability, which can damage pipelines, obstruct roadways, and impair access to critical infrastructure. Seismic events may also affect watershed conditions, alter groundwater pathways, or introduce sediment into storage and treatment systems. Infrastructure accessibility constraints following an earthquake may significantly complicate damage assessment and repair operations.

Water systems play a critical role during and after seismic events. Reliable water supply is essential for fire suppression, emergency response operations, and community recovery. Earthquake-related damage to storage or distribution assets may reduce available firefighting capacity at precisely the time when post-earthquake fire risk is elevated. Maintaining structural integrity, redundancy, and operational flexibility within the water system is therefore a core resilience objective.

Although earthquake occurrence probabilities are inherently uncertain, the potential consequences of moderate to strong seismic events necessitate continued mitigation planning. Infrastructure design standards, seismic considerations in capital improvement planning, and system maintenance practices all contribute to reducing earthquake-related risk. The exposure patterns illustrated in the modeled scenarios reinforce the importance of evaluating both shaking impacts and secondary hazard interactions.

HUNTING CREEK BERRYESSA EARTHQUAKE SCENARIO M71

HOWELL MOUNTAIN MUTUAL WATER COMPANY

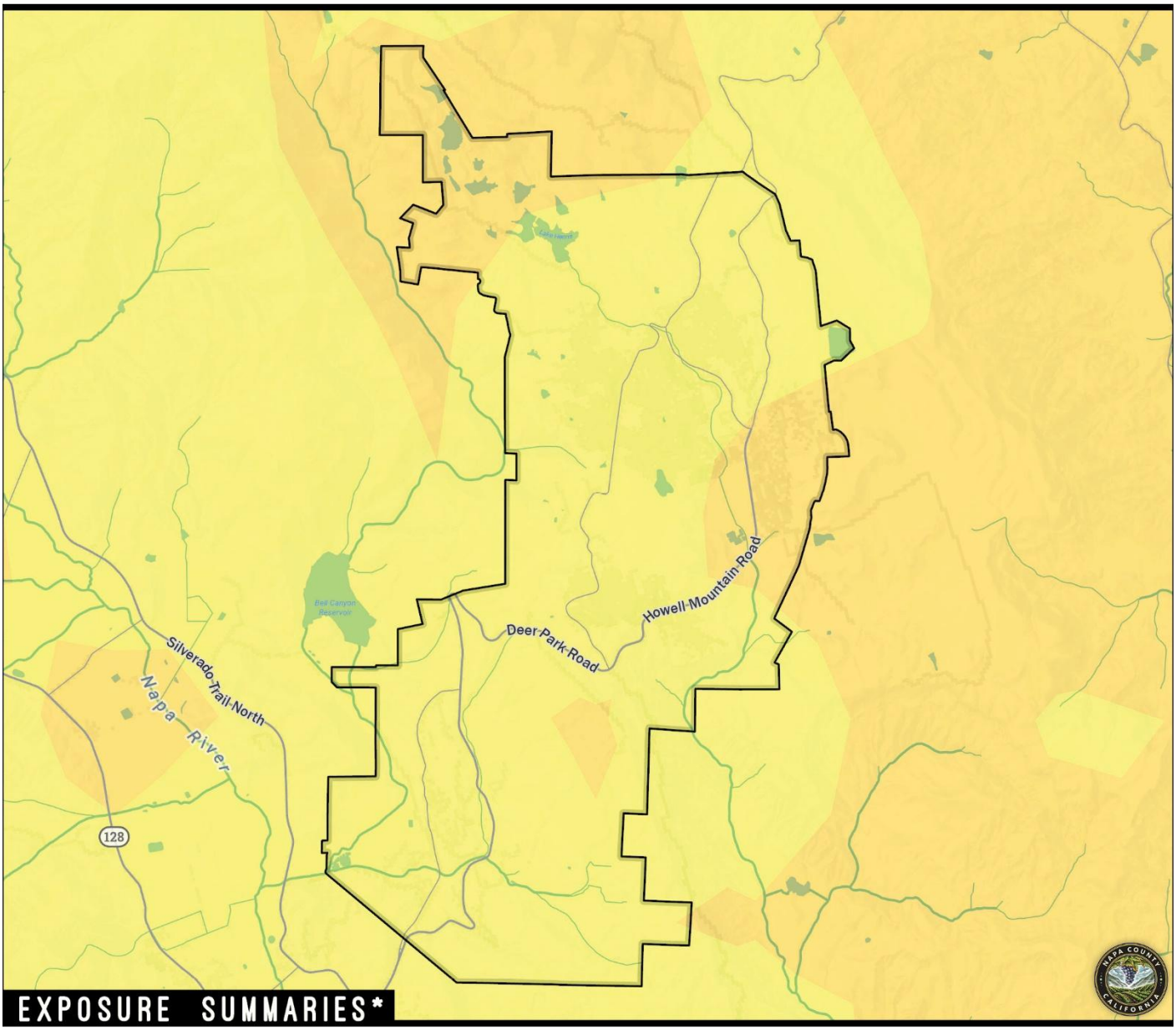


Figure 7-13: Exposure Summary – HMMWC Earthquake Risk (M7.1 Hunting Creek–Berryessa)

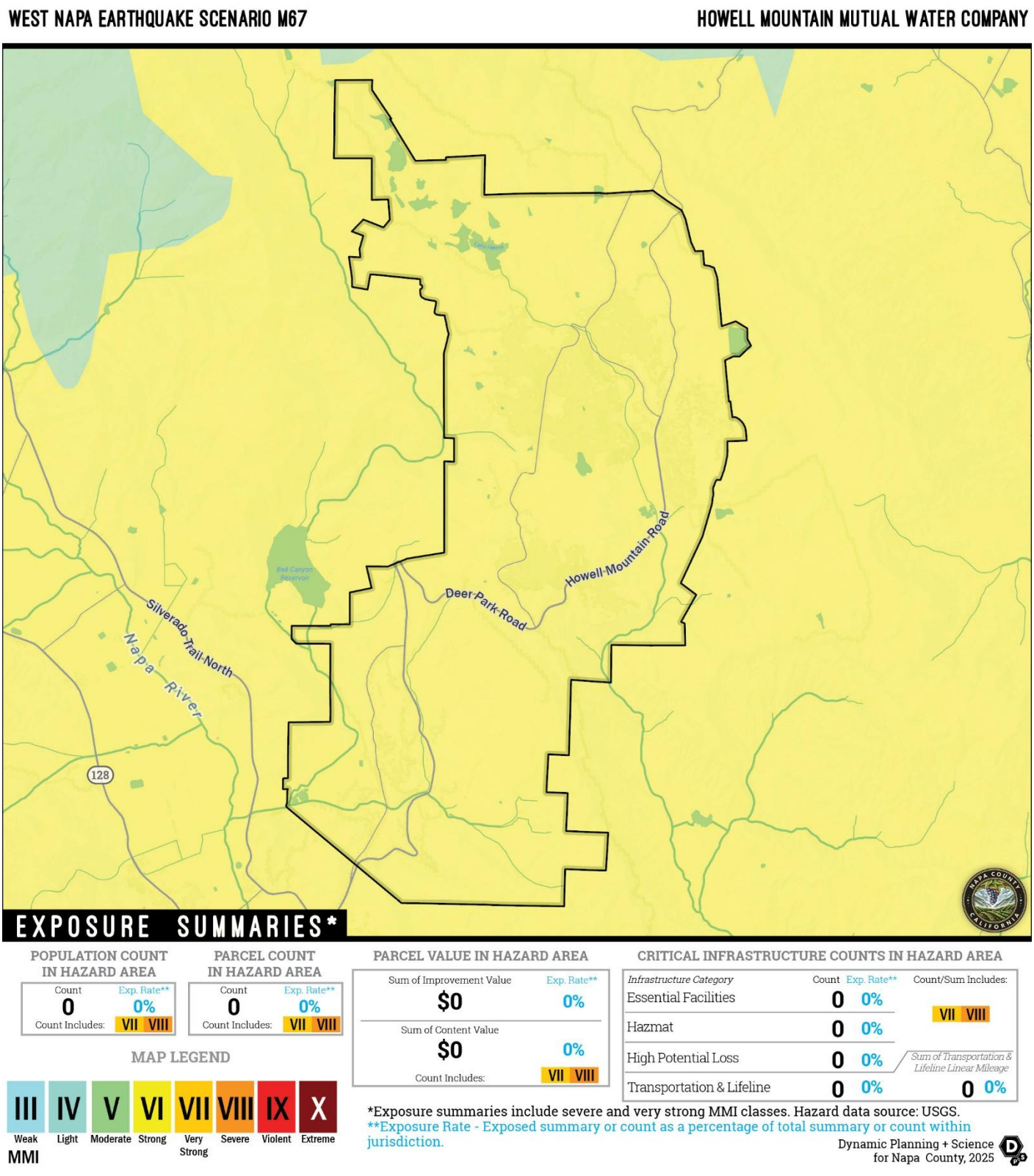


Figure 7-14: Exposure Summary – HMMWC Earthquake Risk (M6.7 West Napa)

7.5.2.4 Drought Hazard

The National Drought Monitor provides drought data and maps nationally and on a localized, watershed scale. The National Drought Monitor is the product of 11 agencies, including the NDMC, NOAA and USDA, and is available at http://droughtmonitor.unl.edu/. The National Drought Monitor categorizes the level of drought from D0 through D4, with D4 being the highest "exceptional drought." Table 7-5 depicts drought classifications and impacts from the level of drought occurrence in California, while Figure 7-15 shows a time series of the level of drought in Napa County from 2000 to 2026 according to the National Drought Monitor.

Drought represents one of the most consequential and persistent hazards affecting the HMMWC service area. Unlike rapid-onset hazards such as wildfire or earthquake, drought hazards develop gradually but may produce prolonged and system-wide impacts. The Mediterranean climate characteristic of Napa County, marked by highly seasonal precipitation patterns, inherently exposes mountain water systems to variability in annual rainfall, extended dry periods, and multi-year drought cycles.

HMMWC operates within a region where water supply reliability is closely tied to precipitation, watershed conditions, groundwater availability, and storage capacity. Reduced rainfall and diminished snowpack in surrounding upland areas may decrease surface water inflows, limit groundwater recharge, and lower reservoir storage levels. Prolonged dry conditions may therefore directly affect raw water availability, system pressure stability, and operational flexibility.

Drought hazards present both supply-side and demand-side challenges. On the supply side, declining source water levels may require increased reliance on stored reserves, pumping adjustments, or conservation measures. Extended drought conditions may also affect groundwater production, as declining water tables increase pumping depths, energy demands, and well performance variability. Reduced surface flows and diminished watershed moisture conditions may further influence water quality characteristics, including temperature, turbidity, and constituent concentrations.

Demand-side pressures often intensify during drought periods. Elevated temperatures and reduced precipitation typically increase outdoor water use, landscape irrigation demands, and evaporative losses. These consumption patterns may strain system capacity precisely when source water availability is constrained. In mountain communities with dispersed development and storage-dependent distribution systems, maintaining adequate reserves becomes a critical operational objective.

Drought conditions also interact strongly with other hazards, particularly wildfire. Extended dry periods increase vegetation stress, fuel loading, and ignition susceptibility, contributing to elevated wildfire risk. Wildfire events occurring under drought conditions may further degrade watershed function, reduce infiltration capacity, and impair long-term water supply resilience. Post-fire landscapes frequently exhibit increased runoff, erosion, and sediment transport, compounding drought-related supply challenges.

Operational impacts associated with drought hazards may include mandatory conservation measures, supply restrictions, infrastructure stress, and increased system management complexity. Reduced

revenues associated with conservation mandates may affect financial stability, while increased operational costs related to pumping, monitoring, and treatment adjustments may strain budget resources. These dynamics highlight the interconnected nature of hydrologic, operational, and economic resilience.

Climate variability projections for California indicate the potential for more frequent and more severe drought cycles, increasing the long-term relevance of water supply planning and adaptive management strategies. Rising temperatures, shifting precipitation patterns, and altered hydrologic responses may intensify both drought duration and severity. For HMMWC, drought hazards therefore represent not only a recurring operational challenge but also a central driver of long-term system planning.

Table 7-5: Drought Classifications and Impacts

Category	Description	Possible Impacts
D0	Abnormally Dry	▪ Soil is dry; irrigation delivery begins early ▪ Dryland crop germination is stunted ▪ Active fire season begins
D1	Moderate Drought	▪ Dryland pasture growth is stunted; producers give supplemental feed to cattle ▪ Landscaping and gardens need irrigation earlier; wildlife patterns begin to change ▪ Stock ponds and creeks are lower than usual
D2	Severe Drought	▪ Producers increase water efficiency methods and drought-resistant crops ▪ Grazing land inadequate ▪ Fire season is longer, with high burn intensity, dry fuels, and large fire spatial extent, more fire crews on staff ▪ Lake- and river-based tourism declines; boat ramps close ▪ Trees are stressed; plants increase reproductive mechanisms; wildlife diseases increase ▪ Water temperatures increase; programs to divert water to protect fish begin ▪ River flows decrease; reservoir levels are low and banks are exposed
D3	Extreme Drought	▪ Federal water is not adequate to meet irrigation contracts; extracting supplemental groundwater is expensive ▪ Fire season lasts year-round; fires occur in typically wet parts of the state; burn bans are implemented ▪ Ski and rafting business are low; mountain communities suffer ▪ Low water levels impede fish migration and cause lower survival rates ▪ Wildlife encroaches on developed areas; little native food and water is available for bears, which hibernate less ▪ Water sanitation is a concern; reservoir levels drop significantly; surface water is nearly dry; flows are very low; water theft occurs ▪ Livestock need supplemental feed, cattle and horses are sold; little pasture remains ▪ Well and aquifer levels decrease; homeowners drill new wells

Category	Description	Possible Impacts
D4	Exceptional Drought	▪ Fire season is very costly; number of fires and areas burned are extensive ▪ Many recreational activities are affected ▪ Fields are left fallow; orchards are removed; vegetable yields are low; honey harvest is small; agricultural unemployment is high, food aid is needed ▪ Fish rescue and relocation begin; pine beetle infestation occurs; forest mortality is high; wetlands dry up; wildlife death is widespread; algae blooms appear ▪ Poor air quality affects health: greenhouse gas emissions increase as hydropower production decreases; West Nile outbreaks rise ▪ Water shortages are widespread; surface water is depleted; federal irrigation water deliveries are curtailed; water prices are extremely high; wells are dry, more and deeper wells are drilled; water quality is poor

Source: Adapted from U.S. Drought Monitor Drought Classifications and Impacts

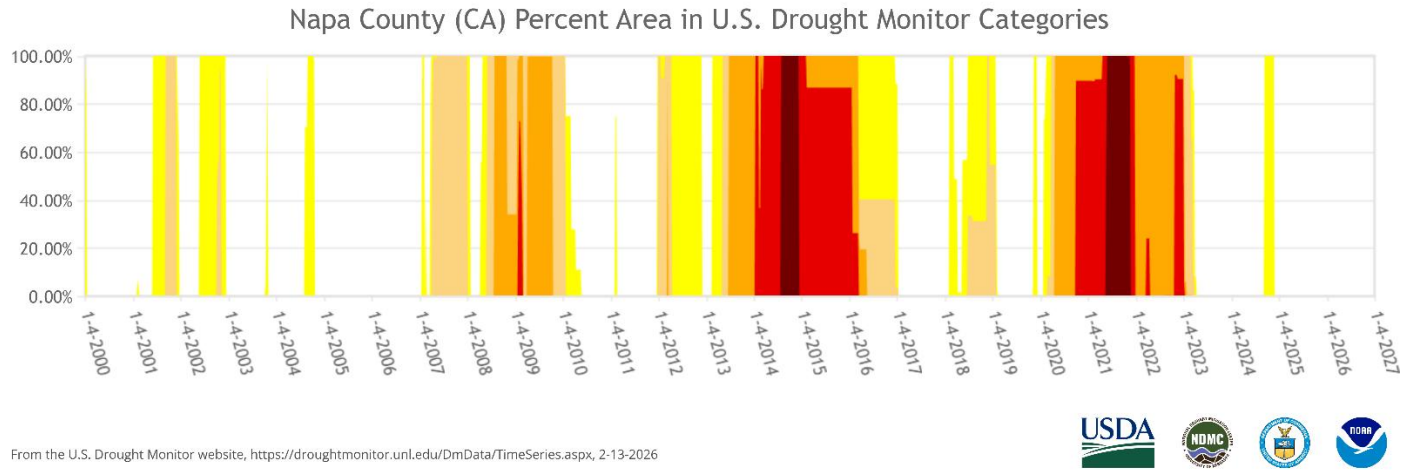


Figure 7-15: Drought Severity Timeline 2000-2026

7.5.2.5 Severe Weather Hazard

Severe weather hazards affecting the HMMWC service area include extreme heat, high wind events, heavy rainfall, and occasional winter snow and freeze conditions. Due to the mountainous terrain, elevation variability, and rural development pattern, weather-related hazards within the service area often manifest differently than in valley environments. Localized microclimates, steep slopes, and vegetation-dominated landscapes can amplify both the direct and secondary impacts of severe weather events.

Severe weather conditions primarily function as stressors that influence water demand, infrastructure reliability, watershed stability, and emergency response conditions. These hazards are closely interconnected with other risks affecting the region, particularly wildfire, drought, erosion, and power disruptions. Evaluating severe weather within the hazard mitigation framework provides important context for understanding system vulnerabilities, operational constraints, and resilience planning considerations.

Heavy Rainfall & Storm Events

Although drought conditions are common, California increasingly experiences episodic, high-intensity rainfall events. Atmospheric river systems can deliver large volumes of precipitation over short durations, contributing to urban flooding, roadway impacts, and localized drainage failures.

Heavy rainfall and storm events represent a recurring severe weather hazard within the HMMWC service area. The Mediterranean climate characteristic of Napa County produces highly seasonal precipitation patterns, with the majority of annual rainfall occurring during winter months. While most seasonal storms are beneficial for reservoir recharge and watershed recovery, episodic high-intensity rainfall events may generate hazardous conditions, particularly within mountainous terrain.

The steep slopes, confined drainage corridors, and variable soil conditions present throughout the Howell Mountain region increase sensitivity to storm-related impacts. Intense rainfall may saturate soils, reduce slope stability, and trigger localized landslides, debris flows, and erosion events. These processes may damage pipelines, access roads, reservoirs, and appurtenant facilities. Stormwater runoff may also transport sediment, organic material, and debris into surface water sources, affecting raw water quality and treatment operations. In post-wildfire landscapes, storm-related hazards may be amplified due to vegetation loss, hydrophobic soils, and increased erosion susceptibility.

Heavy rainfall events may also influence water system operations through flooding, power disruptions, and infrastructure stress. Although widespread riverine flooding is less common in elevated mountain environments, localized flooding may occur along drainage pathways, culverts, and low-lying infrastructure corridors. Storm conditions frequently coincide with high winds and falling vegetation, increasing the potential for roadway obstructions and electrical outages. Power interruptions may affect pumping, treatment, and monitoring systems, thereby influencing operational reliability.

Despite these risks, storm events also play a critical role in regional water supply sustainability. Seasonal precipitation replenishes reservoirs, supports watershed recovery, and restores soil moisture conditions following extended dry periods. However, increasing climate variability, including projections for more intense storm systems and altered precipitation patterns, introduces greater uncertainty into watershed behavior and infrastructure performance. Periods of prolonged drought followed by intense rainfall may increase the likelihood of erosion, slope instability, and sediment transport.

Strong Winds

High wind events represent a significant severe weather hazard within the HMMWC service area. The mountainous terrain, elevated ridgelines, and exposure to regional weather patterns contribute to periodic wind conditions capable of producing both direct and cascading impacts. Wind events may occur in association with winter storm systems, frontal passages, and seasonal offshore wind patterns, each presenting distinct operational and hazard implications.

High winds pose several risks to water system infrastructure and operations. Strong wind conditions may result in downed trees, falling branches, and windborne debris capable of damaging above-ground facilities,

electrical components, communication systems, and access routes. Buried infrastructure, while less directly exposed, may be affected by secondary impacts such as uprooted vegetation, slope destabilization, or debris movement. Roadway obstructions caused by fallen trees or limbs may restrict access to reservoirs, treatment facilities, pump stations, and distribution assets, potentially delaying maintenance or emergency response activities.

Power reliability is particularly sensitive to high wind events. Wind conditions frequently contribute to electrical outages through damage to transmission lines, poles, and distribution equipment. In wildfire-prone regions such as Napa County, high wind conditions may also trigger PSPS events intended to reduce ignition risks. Power disruptions may affect pumping systems, treatment operations, telemetry equipment, and system monitoring functions, introducing operational challenges and reducing system flexibility during severe weather periods.

High wind hazards are strongly interconnected with wildfire risk. Wind-driven fire behavior is a well-documented characteristic of major wildfire events within Napa County and surrounding regions. High winds may accelerate fire spread, increase ember transport, and intensify fire severity, thereby increasing the potential for damage to watershed lands, reservoirs, pipelines, and storage facilities. Extended wind events combined with dry vegetation and elevated temperatures may therefore amplify regional wildfire conditions.

Environmental impacts associated with high wind events may include increased tree fall, vegetation damage, and localized erosion. Wind-related disturbances to forested landscapes may alter watershed stability, increase debris loading, and affect drainage patterns. These effects may influence both infrastructure vulnerability and raw water quality conditions.

7.5.2.6 Climate Change Hazard

Average annual temperatures across most of California have already increased by more than 1°F, with some areas experiencing rises of over 2°F when comparing the 1901–1960 average to that of 1986–2016. Daily maximum temperatures, a key indicator of extreme heat, are projected to increase by 4.4°F to 5.8°F by 2050 and by 5.6°F to 8.8°F by 2100. Heat waves that impact public health, known as heat-health events, are also expected to intensify across the state. By 2050, these events are projected to last up to two weeks longer in the Central Valley and occur four to ten times more often in the Northern Sierra region (California Natural Resources Agency, 2022).

California is already experiencing significant impacts from climate change, including prolonged drought, a lengthened wildfire season, increased coastal flooding and erosion, and widespread tree mortality. The state has observed rising average temperatures, more extreme heat days, fewer cold nights, a longer growing season, and shifts in the water cycle, with less winter precipitation falling as snow. In addition, summertime fog has declined by approximately 33%, and both snowmelt and rainwater runoff are occurring earlier in the year (Cal OES, 2018).

Long-term trends indicate a 12% to 20% decline in fog across California from 1900 through projections to 2070. Climate experts suggest that warming temperatures reduce the ability of air masses to cool enough to produce fog, which plays a critical role in supporting California's ecosystems (Grantham, Teodore; University of California, Berkeley, 2018).

Climate change represents a long-term stressor that influences the frequency, intensity, and interaction of hazards affecting the HMMWC service area. Observed and projected climate trends throughout California indicate rising average temperatures, increased variability in precipitation patterns, more frequent extreme heat events, and a greater likelihood of prolonged drought conditions. These changes introduce evolving risks that directly affect water supply reliability, infrastructure performance, watershed stability, and overall system resilience.

Temperature increases are among the most significant climate-related factors affecting the region. Rising temperatures may contribute to higher evapotranspiration rates, reduced soil moisture retention, and increased reservoir evaporation. These processes may intensify drought severity, reduce effective water storage capacity, and increase system demand, particularly during extended warm-season periods. Elevated temperatures may also exacerbate water quality challenges by influencing constituent concentrations, biological activity, and disinfection byproduct formation within storage and treatment systems.

Changes in precipitation patterns further complicate water resource management. Climate projections suggest increasing variability characterized by longer dry periods punctuated by more intense storm events. Reduced snowpack, altered runoff timing, and shifts in seasonal rainfall distribution may affect watershed recharge dynamics and reservoir inflows. Periods of prolonged drought followed by high-intensity rainfall may increase the potential for erosion, sediment transport, slope instability, and infrastructure stress. These hydrologic shifts introduce greater uncertainty into long-term water supply planning and operational management.

Climate change also amplifies wildfire risk within the HMMWC service area. Warmer temperatures, extended dry seasons, and vegetation stress contribute to increased fuel loading, reduced live fuel moisture, and heightened ignition susceptibility. Wildfire events may produce both immediate infrastructure impacts and long-term watershed disturbances affecting water quality, sedimentation rates, and hydrologic function. Post-fire landscapes may exhibit increased runoff, erosion, and contaminant transport, compounding operational challenges.

Severe weather hazards are similarly influenced by changing climate conditions. Increasing frequency and intensity of extreme heat events may elevate peak water demand and strain infrastructure systems. More intense storm systems may increase risks associated with flooding, erosion, and slope failure. Variability in winter weather patterns may alter watershed recovery processes and reservoir recharge behavior. Collectively, these factors illustrate the interconnected nature of climate-driven hazards.

For HMMWC, climate change functions as a hazard multiplier that intensifies existing vulnerabilities rather than introducing entirely new risks. Water supply variability, infrastructure resilience, watershed

management, and operational flexibility remain central to long-term adaptation strategies. Mitigation considerations include maintaining adequate storage capacity, enhancing system redundancy, integrating climate projections into capital planning, and supporting conservation measures designed to moderate demand during periods of stress.

7.5.3 Climate Change Impacts & Vulnerable Populations

Climate change introduces compounding stressors that may disproportionately affect vulnerable populations within the HMMWC service area. While climate-related impacts influence the entire community, certain groups may experience heightened sensitivity due to age, health status, mobility limitations, economic conditions, or housing characteristics. Understanding these differential effects is essential for evaluating risk, supporting equitable resilience, and maintaining reliable utility service under changing environmental conditions.

Increasing temperatures represent one of the most significant climate-driven factors affecting vulnerable populations. More frequent and prolonged extreme heat events may elevate health risks, particularly for elderly individuals, young children, and persons with pre-existing medical conditions. Reliable potable water becomes critically important during heat events to support hydration, sanitation, and cooling needs. Disruptions to water service or reduced system capacity during high-demand periods may therefore produce disproportionate consequences for individuals with greater physiological sensitivity or limited adaptive resources.

Climate change may also intensify drought conditions, influencing both water availability and affordability considerations. Extended drought periods may necessitate conservation measures, demand restrictions, and rate adjustments that affect household water use patterns. While many households may adapt through behavioral or technological changes, lower-income residents or individuals with fixed incomes may face increased challenges associated with rising utility costs, landscape modification expenses, or infrastructure repair needs. Water shortages may further affect households reliant on consistent water access for medical, sanitation, or caregiving purposes.

Wildfire risk, which is strongly influenced by climate conditions, presents additional implications for vulnerable populations. Increased wildfire frequency and severity may result in evacuation events, property damage, prolonged displacement, and degraded air quality. Individuals with mobility limitations, disabilities, or access and functional needs may face elevated challenges during evacuations and recovery processes. Post-fire disruptions to water quality, infrastructure, or power systems may further affect households with limited capacity to manage extended service interruptions.

Severe weather variability may also introduce indirect effects. Heavy rainfall following prolonged dry periods may increase erosion, slope instability, and infrastructure disruptions that influence service reliability. Power outages associated with heat events, storms, or wildfire prevention measures may affect pumping and treatment operations. Vulnerable populations may be particularly sensitive to cascading utility disruptions involving water, power, and transportation systems.

Housing characteristics further shape vulnerability under climate change conditions. Residential structures located within wildfire-prone or terrain-sensitive areas may face elevated exposure to hazard impacts. Homeowners may encounter increasing insurance costs, mitigation expenses, and rebuilding challenges following hazard events. Renters may experience displacement or reduced housing stability in post-disaster environments. These dynamics influence both household resilience and community recovery capacity.

Although demographic indicators within the HMMWC service area suggest relatively lower overall social vulnerability compared to more densely urbanized regions, climate change functions as a hazard multiplier that may amplify existing sensitivities. Adaptive capacity is influenced not only by income or ownership patterns but also by infrastructure reliability, mobility, health conditions, and access to resources. Maintaining water system resilience, supporting clear communication strategies, and integrating climate considerations into planning efforts are therefore critical for protecting vulnerable populations.

7.5.4 Hazard Problem Statements

As part of the mitigation action identification process, the Planning Committee for each jurisdiction identified areas of concern (aka problem statements) for their respective facilities based on the risk assessment and vulnerability analysis, utilizing the RAMP mapping and static snapshot maps. Problem statements focused on the impact, victim, or threat that the hazard could create in the jurisdiction, as described in Table 7-6. Identifying common issues and weaknesses through these problem statements assisted the planning group in understanding the realm of resources needed for mitigation.

The goal is to have at least one mitigation action for every problem statement. Projects or actions have been developed to mitigate each problem identified. See Table 7-8 for a full list of mitigation actions and corresponding problem statements that they address. Each problem statement is coded with a problem number for cross-referencing between Table 7-6 and Table 7-8

Table 7-6: HMMWC Hazard Problem Statements

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-CC-HMMWC-22	Climate Change	Threat	**Howell Mountain Mutual Water Company**	Climate change is increasing the frequency and severity of multiple hazard affecting HMMWC, including drought, severe weather, and wildfire.	ma-CC-HMMWC-119, ma-AH-HMMWC-112, ma-FL-HMMWC-118, ma-DR-HMMWC-114, ma-WF-HMMWC-246, ma-WF-HMMWC-115
ps-DF-HMMWC-34	Dam Failure	Impact	**Howell Mountain Mutual Water Company**	HMMWC has multiple small reservoirs in steep terrain; dam failure could release water and debris into downstream drainages, damaging infrastructure and roads.	ma-FL-HMMWC-118, ma-DF-NCo-120

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-DF-HMMWC-35	Dam Failure	Impact	**Howell Mountain Mutual Water Company**	Failure of Friesen Lakes dam could result in downstream flooding with risk to life, property, and infrastructure.	ma-CC-HMMWC-119, ma-DF-NCo-120, ma-FL-HMMWC-118
ps-DF-HMMWC-36	Dam Failure	Impact	**Howell Mountain Mutual Water Company**	The Treatment Plant is located in a dam inundation zone and, if impacted, would result in the loss of ability to provide water.	ma-FL-HMMWC-118, ma-DF-NCo-120
ps-DF-HMMWC-40	Dam Failure	Victim	**Howell Mountain Mutual Water Company**	A dam failure could disrupt water supply to ~1,500 residents and damage access to the treatment plant.	ma-AH-HMMWC-117, ma-DF-NCo-120, ma-FL-HMMWC-118
ps-DF-HMMWC-382	Dam Failure	Threat	**Howell Mountain Mutual Water Company**	The final Emergency Action Plans (EAPs) for high-hazard dams that were previously developed are not currently available, limiting their use in disaster planning.	ma-FL-HMMWC-118
ps-DF-HMMWC-383	Dam Failure	Impact	**Howell Mountain Mutual Water Company**	Lack of warning gauges and monitoring around dams reduces detection of overtopping, structural issues, or storm-related failures.	ma-FL-HMMWC-118, ma-AH-HMMWC-112
ps-DR-HMMWC-48	Drought	Impact	**Howell Mountain Mutual Water Company**	HMMWC's reservoirs are in a small watershed highly vulnerable to multi-year drought, requiring staged water restrictions and risking depletion of both lake and well supplies.	ma-DR-HMMWC-114, ma-WF-HMMWC-115
ps-DR-HMMWC-51	Drought	Impact	**Howell Mountain Mutual Water Company**	Drought conditions could reduce available water pressure and volume for firefighting operations, limiting suppression effectiveness during wildfires.	ma-WF-HMMWC-115
ps-DR-HMMWC-52	Drought	Victim	**Howell Mountain Mutual Water Company**	Extreme drought may force reliance on trucked water if wells and reservoirs fall below operational levels.	ma-DR-HMMWC-114, ma-WF-HMMWC-115
ps-DR-HMMWC-53	Drought	Victim	**Howell Mountain Mutual Water Company**	Customers face service limitations during long-term drought, including higher surcharges, reduced availability, and tighter restrictions.	ma-DR-HMMWC-114, ma-WF-HMMWC-115
ps--HMMWC-380	Drought	Impact	**Howell Mountain Mutual Water Company**	Lack of automated lake-level monitoring limits real-time drought management and early warning capabilities.	ma-WF-HMMWC-115, ma-FL-HMMWC-118, ma-AH-HMMWC-112
ps--HMMWC-381	Drought	Impact	**Howell Mountain Mutual Water Company**	Public education and outreach requirements during prolonged drought events place additional strain on HMMWC's small team and resources.	ma-DR-HMMWC-114, ma-WF-HMMWC-115

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-EQ-HMMWC-93	Earthquake	Threat	**Howell Mountain Mutual Water Company**	Aging critical facilities are vulnerable to seismic damage, threatening water production and distribution.	ma-EQ-HMMWC-111
ps-EQ-HMMWC-94	Earthquake	Impact	**Howell Mountain Mutual Water Company**	Severe earthquakes could compromise the structural integrity and trigger failure of upstream dams, leading to downstream flooding, loss of life, and disruption of water service for HMMWC customers particularly if aging earthen structures are not seismically retrofitted.	ma-EQ-HMMWC-111, ma-FL-HMMWC-118
ps-EQ-HMMWC-97	Earthquake	Victim	**Howell Mountain Mutual Water Company**	Earthquakes may disrupt service to customers and hinder emergency response due to narrow mountain roads and facility inaccessibility.	ma-EQ-HMMWC-111, ma-WF-HMMWC-115
ps-EQ-HMMWC-101	Earthquake	Threat	**Howell Mountain Mutual Water Company**	Warning signals/alarms from the treatment plant will not function if there is no cell phone service due to a severe earthquake.	ma-AH-HMMWC-112, ma-AH-HMMWC-116, ma-EQ-HMMWC-111
ps-EQ-HMMWC-374	Earthquake	Impact	**Howell Mountain Mutual Water Company**	Pipelines in steep terrain may experience earthquake-induced slope failure, causing leaks, breaks, and access issues despite no historical damages to date.	ma-EQ-HMMWC-111
ps-EQ-HMMWC-375	Earthquake	Threat	**Howell Mountain Mutual Water Company**	Lack of seismic retrofits for tanks and pump houses increases vulnerability to strong shaking	ma-EQ-HMMWC-111
ps-SW-HMMWC-376	Severe Weather	Impact	**Howell Mountain Mutual Water Company**	Severe weather events (windstorms and heavy rain) cause power failures at the water treatment plant and well sites, risking loss of water production and system depressurization.	ma-AH-HMMWC-112
ps-SW-HMMWC-377	Severe Weather	Impact	**Howell Mountain Mutual Water Company**	Heavy rain events can trigger landslides and blocked access roads, hindering staff's ability to reach reservoirs, dams, and treatment facilities.	ma-EQ-HMMWC-111, ma-WF-HMMWC-246
ps-SW-HMMWC-378	Severe Weather	Victim	**Howell Mountain Mutual Water Company**	Power and water outages during severe weather events disproportionately affect vulnerable populations served by HMMWC.	ma-AH-HMMWC-112
ps-SW-HMMWC-379	Severe Weather	Threat	**Howell Mountain Mutual Water Company**	Lack of redundant power and monitoring systems leaves critical facilities exposed during storm-related outages.	ma-AH-HMMWC-112, ma-FL-HMMWC-118

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-WF-HMMWC-201	Wildfire	Impact	**Howell Mountain Mutual Water Company**	Wildfire impacts treatment plant operations, including from power outages and PSPS events, and creates operational hazards for chemical storage, pump houses, and above ground assets.	ma-WF-HMMWC-115, ma-WF-HMMWC-246, ma-AH-HMMWC-112
ps-WF-HMMWC-202	Wildfire	Impact	**Howell Mountain Mutual Water Company**	Wildfires degrade watershed quality, damage water infrastructure, and block access roads, interrupting service and reducing available firefighting water.	ma-AH-HMMWC-117, ma-WF-HMMWC-246
ps-WF-HMMWC-205	Wildfire	Impact	**Howell Mountain Mutual Water Company**	Wildfires could impact communications systems such as knocking out cell towers.	ma-AH-HMMWC-116, ma-AH-HMMWC-112, ma-FL-HMMWC-118
ps-WF-HMMWC-372	Wildfire	Threat	**Howell Mountain Mutual Water Company**	Limited staffing and reliance on manual operations may delay post-wildfire system inspections and emergency response.	ma-FL-HMMWC-118, ma-WF-HMMWC-246
ps-WF-HMMWC-373	Wildfire	Threat	**Howell Mountain Mutual Water Company**	Coordination gaps with emergency responders during wildfire events may hinder timely response, especially in areas with poor access or signage.	ma-WF-HMMWC-115

7.6 Mitigation Strategy

This section provides the framework for how HMMWC will reduce hazard risk within its jurisdiction while supporting the broader goals of the Napa County MJHMP. It includes an overview of existing capabilities, opportunities to strengthen resilience, and the district's prioritized mitigation actions. Together, these elements demonstrate how HMMWC integrates hazard awareness into its planning and development processes while contributing to a coordinated countywide approach.

Within the Napa County MJHMP, the mitigation strategy serves as the roadmap for future hazard mitigation efforts. For HMMWC, the strategy outlined in this annex reflects the outcomes of the countywide planning process while also addressing the district's unique risks, priorities, and community needs. The strategy is designed to reduce vulnerabilities identified in the risk assessment, including the problem statements developed for wildfire, earthquakes and severe weather, and climate change.

Mitigation actions identified in this annex include both policy-based and project-based initiatives, with an emphasis on integrating resilience into land use planning, infrastructure investments, and community programs. Actions are structured to align with FEMA's requirements and to coordinate with existing district, county, and regional planning mechanisms. Each action identifies responsible parties, potential funding sources, and the resources needed for implementation.

For HMMWC, this strategy provides a framework for strengthening resilience by combining district-led initiatives, such as infrastructure improvements, and community preparedness, with regional coordination through the MJHMP. By advancing these efforts in alignment with the Contingency Plan and other local planning documents, HMMWC enhances its ability to reduce hazard risk while supporting long-term community safety, sustainability, and economic stability.

The subsections that follow describe these elements in detail:

- **Sections 7.6.1, Capabilities and Opportunities,** provides a summary of the company's capacity to address natural hazards.
- **Section 7.6.2, Mitigation Action Plan,** presents HMMWC's prioritized actions to guide implementation in coordination with countywide strategies.
- **Section 7.6.3, Status of Previous Mitigation Actions,** provides a summary of all previous actions and their current status, whether completed, cancelled, or revised.

Aligning the Action Plan

This section connects HMMWC's mitigation actions with its existing capabilities and areas for growth. Capability assessments are a required element of hazard mitigation planning under the Disaster Mitigation Act of 2000 and FEMA's 2023 guidance, ensuring that actions are realistic, achievable, and aligned with available resources.

The section begins with a summary of HMMWC's capabilities across four areas: planning and regulatory, administrative and technical, fiscal, and education and outreach. This overview highlights the tools and

strengths that the district already uses to reduce hazard risk. The section then provides a detailed analysis of each capability area, identifying both current practices and opportunities to expand resilience.

7.6.1 Capabilities & Opportunities

This section provides a detailed assessment of the company's current capabilities to support hazard mitigation, as well as future opportunities. This consists of describing how HMMWC is planning for hazards and growth and a summary of its existing capabilities and the potential for enhancement.

7.6.1.1 Planning for Hazards & Growth

Planning for hazards and future growth within the HMMWC service area requires balancing long-term water supply reliability, infrastructure resilience, environmental conditions, and development patterns characteristic of a rural mountain community. Unlike urbanized jurisdictions experiencing rapid expansion, growth within the HMMWC service boundary is generally incremental and closely tied to parcel-level development, residential improvements, and post-hazard reconstruction. Nevertheless, hazard exposure, resource constraints, and climate variability necessitate proactive planning strategies to maintain system sustainability.

Hazard conditions represent a defining influence on infrastructure planning and operational decision-making. The service area's elevated wildfire risk, recurring drought cycles, seismic exposure, and terrain-related vulnerabilities require that hazard considerations be integrated into capital improvement planning, system maintenance, and water resource management. Infrastructure investments, including storage expansion, pipeline replacement, and treatment upgrades, function not only as operational improvements but also as mitigation measures designed to reduce system vulnerability. Planning frameworks must therefore account for both routine service demands and stress conditions associated with hazard events.

Water supply variability is central to growth and development planning. HMMWC's reservoir- and watershed-dependent system is inherently sensitive to precipitation patterns, drought severity, and climate-driven hydrologic changes. Future connections, system expansions, and demand projections must consider long-term supply reliability, storage capacity, and operational flexibility. Conservation policies and drought response measures serve as essential planning tools that support system stability during periods of reduced availability. This resource-dependent planning environment differs from systems with extensive interconnections or diversified supply portfolios.

Growth trends within the service area are strongly influenced by geographic constraints and hazard exposure. Steep slopes, limited developable land, and infrastructure extension challenges naturally moderate development intensity. In hazard-prone mountain environments, redevelopment and reconstruction following wildfire or storm-related events may represent a more significant driver of construction activity than net-new growth. Planning for these conditions requires evaluating not only anticipated demand increases but also potential fluctuations associated with housing loss, rebuilding cycles, and temporary population shifts.

Hazard mitigation planning further supports long-term growth sustainability. By identifying vulnerabilities, assessing risk, and prioritizing resilience investments, HMMWC strengthens its capacity to accommodate future demand while reducing exposure to system disruptions. Infrastructure durability, storage adequacy, water quality protection, and operational continuity remain critical objectives. Planning for hazards and growth is therefore not solely a matter of accommodating expansion but rather ensuring that future conditions do not compromise system reliability or community resilience.

Climate change introduces an additional layer of planning complexity. Increasing temperature trends, evolving precipitation variability, and intensifying severe weather patterns may influence both water demand and hazard frequency. Adaptive management strategies, infrastructure modernization, and demand management policies provide mechanisms for addressing uncertainty. Long-term planning efforts must remain flexible, allowing the company to respond to changing environmental conditions while maintaining financial and operational stability.

7.6.1.2 Development & Hazard Considerations

Development within the HMMWC service area is strongly influenced by the region's mountainous terrain, environmental constraints, and elevated exposure to natural hazards. The rural character of the community, combined with steep slopes, forested landscapes, and limited infrastructure corridors, shapes both the pattern and pace of growth. Unlike urbanized areas characterized by concentrated expansion, development within the service boundary generally occurs incrementally through parcel-level construction, residential improvements, and redevelopment activities.

Hazard exposure represents a defining factor affecting development feasibility and long-term sustainability. The service area's location within a high wildfire risk environment introduces considerations related to defensible space, vegetation management, emergency access, and structural resilience. Wildfire hazards influence building design, site planning, insurance conditions, and infrastructure protection measures. Development decisions must therefore account for both life safety and the protection of critical lifeline systems, including water storage, treatment, and distribution assets.

Terrain-related hazards further shape development conditions. Steep slopes, variable soil stability, and localized drainage patterns contribute to potential risks associated with landslides, erosion, and stormwater impacts. Site grading, foundation design, and infrastructure placement must consider slope stability and runoff behavior, particularly during heavy rainfall events. Disturbance of natural slopes may alter drainage conditions and increase susceptibility to localized ground movement, creating long-term maintenance and risk management challenges.

Seismic hazards introduce additional development considerations. Earthquake-induced ground shaking may affect structures, buried utilities, storage facilities, and mechanical systems. Secondary effects, including slope failures and localized ground deformation, may compound infrastructure vulnerability. Development patterns in mountainous environments must therefore integrate structural design standards and site-specific geotechnical evaluations to reduce seismic risks.

Water supply reliability represents a central constraint influencing development potential. HMMWC's reservoir- and watershed-dependent system is inherently sensitive to precipitation variability, drought cycles, and climate-driven hydrologic changes. New connections, demand increases, and infrastructure extensions must be evaluated within the context of long-term supply sustainability, storage capacity, and operational flexibility. Resource limitations associated with drought hazards may influence growth trajectories, conservation requirements, and system expansion decisions.

Hazard conditions also affect redevelopment and reconstruction dynamics. Historical wildfire events within Napa County have demonstrated the potential for structural losses, prolonged displacement, and rebuilding cycles within the Howell Mountain region. Post-disaster redevelopment may introduce updated building standards, infrastructure improvements, and hazard mitigation measures. These processes may alter demand patterns, infrastructure needs, and long-term community characteristics.

Climate change further amplifies the interaction between development and hazard conditions. Increasing temperature trends, evolving precipitation variability, and intensified severe weather patterns may influence both hazard frequency and infrastructure performance. Development planning must therefore consider not only existing hazard exposures but also projected future conditions that may affect water demand, watershed stability, and system resilience.

7.6.1.3 Capabilities & Opportunities Assessment

To develop a realistic and actionable mitigation strategy, it must account for existing jurisdictional capabilities and what future opportunities there are to enhance those capabilities for purposes of hazard mitigation. This section provides an assessment of the district's existing capabilities and future opportunities, including planning and regulatory, administrative and technical, fiscal, and public outreach and education capabilities. This assessment also identifies opportunities to integrate this MJHMP into future planning, policies, or programs to weave mitigation efforts into daily operations and address hazard problems wholistically. Capabilities are categorized into four groups and include various mechanisms.

- **Planning and Regulatory Capabilities:** Existing long-range plans, emergency response plans, hazard-specific plans, land use policies, and building and development standards.
- **Administrative and Technical Capabilities:** Available expertise in emergency services, engineering, grant management, and community planning.
- **Fiscal Capabilities:** Budgetary capacity, taxing authority, grants, and other funding mechanisms that can support mitigation projects.
- **Outreach and Education Capabilities:** Existing programs for providing technical assistance, community education, public warnings, and stakeholder engagement.

A full description of the process used to develop the capabilities assessment is provided in Volume 1, Section 2.3.3.

This capabilities and opportunities assessment for HMMWC lists the various types of capabilities along with how they have been, currently are, or will in the future be integrated into hazard mitigation planning efforts.

The three "HMP Integration" columns that identify the capability's status and usage are color-coded with green, yellow, or orange shading to communicate the following:

- **Status:** If the capability is present at all and what level of use it has generally.
- **Current Mitigation Use:** If the capability is currently being used in mitigation efforts, specifically, and at what level.
- **Future Opportunity:** If there is a future opportunity to integrate the capability into mitigation efforts and at what level.

Summary of Capabilities & Opportunities

This Capabilities and Opportunities Assessment for HMMWC summarizes the various types of capabilities it has for hazard mitigation currently. The assessment also identifies opportunities to integrate, expand, and improve the agency's capabilities for future hazard mitigation. Table 7-7 provides a comprehensive list of capabilities and identifies the current status, current mitigation use, and future opportunities.

Planning & Regulatory

HMMWC's planning and regulatory capabilities reflect its role as a small, member-governed mutual water company operating in a hazard-prone mountain environment. Hazard mitigation is primarily addressed through operational needs, regulatory compliance, targeted projects, and Board-directed actions rather than through comprehensive long-range planning programs or a formal Capital Improvements Program.

Recent improvements, including backup generator installations, VFD retrofits, system hardening, defensible space clearing, vegetation management, and fuel reduction work, demonstrate the company's ability to implement practical resilience measures. These efforts help reduce vulnerability to wildfire, power outages, seismic impacts, and other operational disruptions, although they are generally project-based rather than part of formal hazard-specific plans.

Drought planning is one of HMMWC's strongest capabilities. The adopted 2022 Drought and Water Shortage Contingency Plan provides a structured five-stage response system tied to raw water storage levels and is used to guide conservation, demand management, and public communication during water shortages.

HMMWC does not maintain formal stormwater, floodplain, groundwater, climate action, FireWise, seismic modernization, or CWPP programs, as many of these functions fall outside the company's scope or capacity. However, existing customer communication tools, including billing notices, hotline messaging, regulatory reporting, and service updates, provide a foundation for expanding wildfire, drought, and emergency preparedness outreach in the future.

Future integration of the MJHMP will occur through various processes and mechanisms outlined across multiple mitigation actions (Table 7-8). Key opportunities for future hazard mitigation integration with HMMWC's existing planning mechanisms include incorporating updated risk assessment, hazard-specific vulnerability findings, and projected climate change impacts into the Dam Failure Planning & Warning

System Upgrades (ma-FL-HMMWC-118), and the Water Conservation Outreach & Education (ma-DR-HMMWC-114).

Administrative & Technical

HMMWC's administrative and technical capacity reflects the lean structure of a small, member-governed mutual water utility. Core functions focus on system operations, regulatory compliance, customer service, and infrastructure maintenance, while specialized engineering, planning, GIS, grant, and technical services are generally provided through outside consultants or partner agencies.

The company does not have a dedicated emergency manager, in-house civil engineer, GIS specialist, or outreach staff. Emergency coordination is likely handled by the General Manager, system operators, or Board leadership, while engineering, mapping, and hazard analysis are supported externally. This structure provides access to needed expertise but may limit internal capacity for advanced preparedness planning, rapid technical evaluation, and structured hazard education.

Customer outreach is conducted through billing notices, regulatory reporting, hotline messaging, and service updates, with expanded communication during drought or operational events. HMMWC has also demonstrated grant and funding coordination capacity by securing outside support for mitigation and infrastructure projects, although grant administration is largely supported through outside assistance.

The ongoing recruitment of a General Manager represents an important opportunity to strengthen organizational capacity. Once filled, this position is expected to improve operational oversight, infrastructure planning, financial management, and hazard preparedness, all of which are critical for a small utility operating in a hazard-prone environment.

Warning Systems & Services

HMMWC's warning and notification capabilities are primarily supported through regional and county-level emergency alert systems rather than internally maintained warning platforms. As a small mutual water company, HMMWC does not operate a centralized public safety alert system or dedicated hazard warning interface for its service area.

Customer communications are generally handled through billing notices, regulatory reporting, hotline messaging, and service-related updates. While these tools support routine operational communication, they are not designed for real-time emergency warning. Flood, wildfire, earthquake, and landslide alerts are therefore managed through Napa County emergency services, CAL FIRE, Nixle, and other regional or statewide systems.

Wildfire warning is the most relevant alert function for HMMWC customers due to the company's mountain setting and elevated wildfire exposure. Although HMMWC does not issue wildfire alerts directly, it can use existing customer communication channels to supplement regional messaging with preparedness reminders, conservation advisories, and service-related hazard information. Overall, the company's

reliance on external warning systems is consistent with its size and capacity, but opportunities exist to strengthen supplemental customer messaging during hazard events.

Fiscal

HMMWC's fiscal capabilities are shaped by its status as a private nonprofit mutual benefit corporation and member-owned water utility. The company does not have authority to levy taxes, impose voter-approved assessments, issue general obligation bonds, or collect stormwater fees. As a result, hazard mitigation and infrastructure resilience efforts are funded primarily through water service fees, capital charges, operating revenues, reserve funds, and external grants.

Water service fees support routine operations, regulatory compliance, maintenance, and incremental capital improvements, including backup power, equipment retrofits, system modernization, and infrastructure hardening. However, the small rate base, affordability concerns, drought-related conservation, seasonal demand changes, and hazard disruptions can limit available funding for larger mitigation projects.

HMMWC may collect hookup or connection-related charges that help offset growth-related infrastructure costs, but these are not organized as a formal system development fee program. Debt financing options are limited, making grants and cost-share programs especially important for funding larger resilience projects. Capital and mitigation decisions are generally guided by operational needs, regulatory compliance, infrastructure condition, available resources, and Board priorities.

Education & Outreach

HMMWC's education and outreach capabilities are typical of a small, member-governed utility. Customer communication primarily occurs through service updates, billing notices, regulatory reporting, website content, Facebook posts, and drought-related messaging. These tools provide functional outreach channels, but hazard-specific education programs are currently limited.

The company's website and social media presence offer cost-effective opportunities to expand messaging related to wildfire preparedness, drought conditions, severe weather, seismic resilience, emergency procedures, conservation guidance, and service interruptions. HMMWC does not maintain a dedicated public-facing facility for hazard materials, and participation in formal annual preparedness events has not been documented.

HMMWC can respond to customer inquiries through standard contact channels, but structured hazard assistance or resilience guidance is not formalized. Future coordination with local partners, such as the Angwin Fire Safe Council and Napa County Resource Conservation District, could strengthen outreach related to wildfire risk reduction, defensible space, vegetation management, watershed resilience, erosion control, and emergency water supply considerations.

ASSESSMENT LEGEND
HMP Integration

Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Table 7-7: HMMWC Capabilities and Opportunities Assessment

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Planning and Regulatory Capabilities				
Hazard Reduction Programs (Annually Conducted)				
Capital Improvements Program (CIP) or Plan				Recent projects include backup generator installations, VFD retrofits, and security reinforcements. Improvements remain project-based and not part of a structured CIP
Annual Fire Prevention Plan				No formal annual plan, but defensible space clearing and fuel reduction projects are now conducted regularly with Cal Fire support.
Seismic Safety Program (Non-structural)				Non-structural seismic program still informal, but VFD retrofits and EAP updates improve preparedness. Staff rely on outside technical support.
Earthquake Modernization Plan (Building Safety)				No formal modernization plan, but vulnerabilities documented and targeted retrofits pursued (VFDs, hardening).
Stormwater Management Program (Annual Inspections)				Stormwater management remains outside HMMWC's scope; no systems or inspection program exist.
Hazard Plans and Programs				

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Floodplain Response Plan				No floodplain-specific plan or priority identified in HMMWC planning documents. Flood risk not included in drought plan or breakout discussions.
Community Wildfire Protection Plan (CWPP)				HMMWC does not maintain a CWPP. Wildfire mitigation measures (e.g., vegetation management) occur, but no formal plan or CWPP reference exists.
Ground Water Management Planning / Plans				HMMWC relies on surface water (Friesen Lakes). No groundwater management plan or documentation in drought or strategic planning.
Climate Action Plan				No Climate Action Plan has been developed or referenced. Climate change impacts are noted generally in hazard discussions but not tied to a plan.
Drought Mgmt/ Contingency Plan				Adopted 2022 Drought & Water Shortage Contingency Plan with five escalating stages. Actively used for conservation enforcement and outreach. Expansion limited by staffing and funding capacity.
FireWise Communities within District				No evidence of FireWise recognition or active collaboration. Not mentioned in meetings or planning documentation.
Hazard-Related Public Outreach Program				HHMMWC engages in general outreach (billing notices, hotline, community events) but lacks a formal hazard-specific outreach program. Opportunities exist to formalize wildfire and drought education.
Administrative and Technical				
Staff Capacity				
Emergency Manager				No formal emergency manager role was identified. Emergency coordination likely falls to General Manager or shared services.

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Civil Engineer				No in-house civil engineer. Engineering support is contracted out, typically to consultants.
Dedicated Public Outreach Personnel				Outreach occurs periodically (e.g., during drought conditions) but no designated staff is assigned to education or hazard outreach roles.
GIS Specialist and Capability				GIS is not internally maintained. Mapping support is likely done through external vendors, and or County of Napa.
Grant Manager, Writer, or Specialist				Measure A funding from Napa County, FEMA grants; relies on outside assistance for grant writing and management.
Other				HMMWC is recruiting for a General Manager position. Once filled, this role is expected to improve daily operations, funding coordination, and emergency planning capacity.
Warning Systems/Services				
General				No centralized general alert system or dedicated hazard warning page found.
Flood				No flood-specific alert system mentioned in Drought Contingency Plan or minutes
Wildfire				Wildfire alerts are available through Napa County, CAL FIRE, and Nixle, but HMMWC has no system tailored to its service area. Expansion may include localized outreach or integration into billing notices.
Geological Hazards				No seismic or landslide-specific warning capability identified. Reliance is on county or regional systems.

Fiscal Capabilities

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Financial Resources for Hazard Mitigation				
Levy for Specific Purposes with Voter Approval				HMMWC is a private nonprofit mutual water company and not a taxing authority.
Utilities Fees				Water service fees are collected and may support hazard-resilient upgrades. Expansion limited by small rate base and affordability concerns.
System Development Fee				Not explicitly listed in documentation. Likely incorporated into hookup or capital fees, but not a formalized system development fee structure.
General Obligation Bonds to Incur Debt				HMMWC does not have the legal authority to issue general obligation bonds.
Special Tax Bonds to Incur Debt	N/A	N/A	N/A	HMMWC is ineligible to issue special tax bonds as a private water entity
Withheld Spending in Hazard-Prone Areas				No policy framework or prioritization system found.
Stormwater Service Fees	N/A	N/A	N/A	HMMWC is not a stormwater management agency and does not levy stormwater fees.
Capital Improvement Project Funding				CIP-type funding exists through operating revenue and reserves. Supports upgrades such as generators, retrofits, and security. Expansion limited by ratepayer base.
Education / Outreach Capabilities				
Education/Outreach Resources				
Website Dedicated to Hazard Topics				Website includes drought updates and general service info, but limited hazard-specific content. Could be expanded to cover wildfire, seismic, and emergency alerts.

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Dedicated Social Media				Limited social media
Hazard Info. Avail. at Library/ Planning Desk				No public-facing facility or repository with hazard materials.
Annual Public Safety Events				No record of participation in local emergency preparedness fairs or events.
Ability to Field Public Tech. Assistance Requests				Website allows general inquiries, but not formal hazard-related assistance intake.
Public Safety Newsletters or Printed Outreach				No routine safety bulletin or newsletter program. Potential exists to include hazard updates in mailings with bills.
Fire Safe Councils				Angwin area is served by a community-level Fire Safe Council. No direct HMMWC involvement but potential exists to collaborate more formally.
Resource Conservation Districts				Partnership potential with Napa County RCD, but no documented collaboration yet.
Other				HMMWC is recruiting for a General Manager position. Once filled, this role is expected to improve daily operations, funding coordination, and emergency planning capacity.

7.6.2 HMMWC Mitigation Action Plan

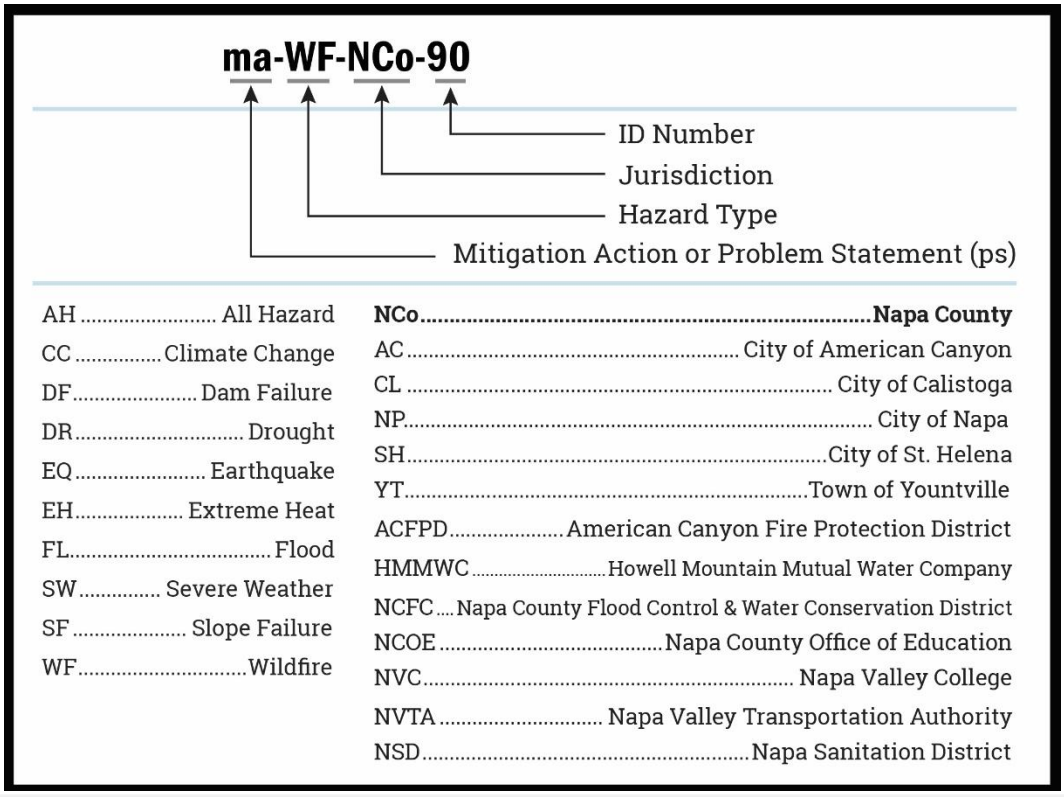


Figure 7-16: Mitigation Action Number Key

HMMWC's mitigation actions were developed through a collaborative process informed by the updated risk assessment, local priorities, and extensive stakeholder engagement. As part of this 2026 MJHMP update, the district reviewed mitigation actions from its prior Local Hazard Mitigation Plan to determine which actions to carry forward, which to consolidate, and where entirely new strategies were required. This careful evaluation ensured that the updated action plan builds upon past commitments while also responding to current risks and future challenges. These new actions were crafted to address the district's highest priority hazards, align with FEMA's hazard mitigation guidance, and reflect local infrastructure vulnerabilities and water resource challenges. The development of these mitigation strategies marks an important step in integrating resilience into the district's operations and long-term planning. All mitigation actions are documented in Volume 2, Table 7-8. This careful evaluation ensured that the updated action plan builds upon past commitments while also responding to current risks and future challenges.

The plan addresses HMMWC's most significant hazards, including wildfire, earthquake, severe weather, and climate change. Each mitigation action is designed to align with FEMA's hazard mitigation guidance and the requirements of the Disaster Mitigation Act of 2000. Where appropriate, overlapping or redundant actions were consolidated into broader, more comprehensive strategies that improve clarity, increase feasibility, and strengthen regional coordination.

The mitigation action prioritization method used by all participating jurisdictions is described in Volume 1, Section 4. Each action specific to HMMWC is documented in Table 7-8, which identifies the responsible department, implementation timeframe, potential funding sources, and resources required to complete the

action. Each action is also assigned a unique alphanumeric identifier (see Figure 7-16) that links the strategy to its associated hazard and supports consistent monitoring and reporting.

HMMWC's approach recognizes that some hazards are most effectively addressed through regional efforts. Weather and wildfire risk reduction often extend beyond the district's boundaries and require collaboration with county, regional, and state partners. By aligning local actions with regional strategies, HMMWC helps to consolidate resources, maximize funding opportunities, and ensure that mitigation projects achieve the greatest benefit for San Pablo Bay, the Napa Valley, and the wider Napa County community.

Collectively, these mitigation actions provide a roadmap for reducing hazard risk, protecting vulnerable populations, and strengthening the long-term resilience of HMMWC.

Table 7-8: HMMWC Mitigation Action Plan

Mitigation No.	Hazard Type	Sub-Hazard	Mitigation Type	Year	Primary Agency	Title	Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Problem Statements
ma-AH-HMMWC-112	All Hazard		PPRO - Property Protection , ES - Emergency Services	2020	Howell Mountain Mutual Water Company	Backup Power Expansion	Install backup generators, battery storage, or other power redundancy systems at critical facilities like the treatment plant and pump stations.	Engineering	Medium	High	3-5 Years	Project	HMGP / BRIC , General Fund	High	ps-EQ-HMMWC-101, ps-EQ-HMMWC-96, ps-WF-HMMWC-204, ps-CC-HMMWC-22, ps-SW-HMMWC-376, ps-SW-HMMWC-378, ps-SW-HMMWC-379, ps-DF-HMMWC-383, ps-DR-HMMWC-380, ps-WF-HMMWC-201, ps-WF-HMMWC-205
ma-DF-HMMWC-118	Dam Failure		PRV - Prevention , ES - Emergency Services	2020	Howell Mountain Mutual Water Company	Dam Failure Planning & Warning System Upgrades	Update as necessary, complete, and file updated Emergency Action Plans for all reservoirs. Install real-time water-level sensors, flow gauges, and other early-warning systems for the highest priority reservoirs.	Engineering	Medium	High	3-5 Years	Capacity / Capability Building	HMGP / BRIC , General Fund	High	ps-DF-HMMWC-34, ps-DF-HMMWC-36, ps-EQ-HMMWC-94, ps-EQ-HMMWC-100, ps-DF-HMMWC-35, ps-DF-HMMWC-40, ps-DF-HMMWC-382, ps-DF-HMMWC-383, ps-CC-HMMWC-22, ps-SW-HMMWC-379, ps-WF-HMMWC-372, ps-DR-HMMWC-380, ps-WF-HMMWC-205
ma-DR-HMMWC-114	Drought		PE&A - Public Education & Awareness	2020	Howell Mountain Mutual Water Company	Water Conservation Outreach & Education	In collaboration with the County, develop a drought outreach and education program and regularly conduct water conservation campaigns with customer incentives.	Administration	Low	Medium	1-3 Years	Capacity / Capability Building	HMGP / BRIC , General Fund	Medium	ps-DR-HMMWC-48, ps-DR-HMMWC-53, ps-DR-HMMWC-52, ps-CC-HMMWC-22, ps-DR-HMMWC-381
ma-DR-HMMWC-115	Drought		SP - Structural Projects	2020	Howell Mountain Mutual Water Company	Emergency Water & Supply Diversification	Evaluate and develop emergency supply options (interties, tanks, backwash reuse). Install automated lake-level and well telemetry systems for drought management.	Engineering	High	High	1-3 Years	Project	HMGP / BRIC , General Fund	High	ps-WF-HMMWC-201, ps-WF-HMMWC-206, ps-DR-HMMWC-53, ps-DR-HMMWC-50, ps-DR-HMMWC-51, ps-WF-HMMWC-373, ps-EQ-HMMWC-97, ps-DR-HMMWC-52, ps-DR-HMMWC-48, ps-DR-HMMWC-381, ps-DR-HMMWC-380, ps-CC-HMMWC-22
ma-EQ-HMMWC-111	Earthquake		PPRO - Property Protection , SP - Structural Projects	2020	Howell Mountain Mutual Water Company	Seismic Retrofit of Critical Facilities & Infrastructure	Retrofit HMMWC buildings, tanks, pipelines, and other critical system components to withstand earthquake shaking. Replace vulnerable pipeline segments with HDPE/flexible joints. Install seismic triggers, shutoff valves, and alarms for tanks and pumps.	Engineering	High	High	3-5 Years	Project	HMGP / BRIC , General Fund	High	ps-EQ-HMMWC-93, ps-EQ-HMMWC-94, ps-EQ-HMMWC-97, ps-EQ-HMMWC-101, ps-EQ-HMMWC-374, ps-EQ-HMMWC-375, ps-SW-HMMWC-377
ma-WF-HMMWC-246	Wildfire		PRV - Prevention , NRP - Natural Resource Protection , SP - Structural Projects	2026	Howell Mountain Mutual Water Company	Fuel Management & Post-Fire Watershed Protections	Develop a program to conduct regular defensible-space clearing around facilities and water assets. Establish procedures to inspect and install slope stabilization and erosion and sediment controls in vulnerable areas post-fire to reduce debris flows and contamination potential.	Maintenance, Engineering	Medium	High	1-3 Years	Capacity / Capability Building	HMGP / BRIC , General Fund , CalFIRE	High	ps-WF-HMMWC-201, ps-WF-HMMWC-202, ps-SW-HMMWC-377, ps-WF-HMMWC-372, ps-CC-HMMWC-22

7.6.1 Status of Previous Mitigation Actions

In 2020, Howell Mountain Mutual Water Company adopted its previous FEMA-approved HMP. This 2026 MJHMP represents a comprehensive update from that previous plan, as discussed in Volume 1, Section 1.5. Table 7-9 provides status updates for all of the previous mitigation actions in HMMWC HMP, from which many of the mitigation actions in Table 7-8 were sourced and revised.

Table 7-9: HMMWC Status of Previous Mitigation Actions

Mitigation No.	Hazard Type	Status	Year	Primary Agency	Title/Description	Reason Cancelled/ Completed
ma-AH-HMMWC-112	All Hazard	Ongoing	2020	HMMWC	Backup Power Expansion	Revised
ma-FL-HMMWC-118	Flood	Ongoing	2020	HMMWC	Dam Failure Planning & Warning System Upgrades	Revised
ma-DR-HMMWC-114	Drought	Ongoing	2020	HMMWC	Water Conservation Outreach & Education	Revised
ma-WF-HMMWC-115	Wildfire	Ongoing	2020	HMMWC	Emergency Water & Supply Diversification	Revised
ma-EQ-HMMWC-111	Earthquake	Ongoing	2020	HMMWC	Seismic Retrofit of Critical Facilities & Infrastructure	Revised
ma-AH-HMMWC-116	All Hazard	Cancelled	2020	HMMWC	Develop alternate access and evacuation routes to ensure critical facilities are accessible during emergencies.	Not within jurisdictional authority
ma-AH-HMMWC-117	All Hazard	Cancelled	2020	HMMWC	Water Quality may be affected by natural hazard events.	Cancelled to re-focus on mitigating water quality impacts via other actions
ma-CC-HMMWC-119	Climate Change	Cancelled	2020	HMMWC	Severe weather may cause increased flooding in the District.	Cancelled to re-focus on dam failure planning and warning system upgrades

Napa County

Multi-Jurisdictional Hazard Mitigation Plan Update

2026

Section 8. Napa County Flood Control and Water Conservation District

VOLUME 2
JURISDICTIONAL ANNEXES

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Napa County

2026 Multi-Jurisdictional Hazard Mitigation Plan Update

Napa County Flood Control and Water Conservation District (NCFC)

Special District Annex

Section 8. Napa County Flood Control & Water Conservation District 8-7

8.1 Scope & Purpose 8-7

8.2 Jurisdictional Setting 8-7

8.2.1 Geography & Climate 8-8

8.2.2 Demographics & Vulnerable Populations 8-11

8.2.3 Economy 8-19

8.2.4 Growth Trends & Future Development 8-20

8.3 Planning Process 8-21

8.3.1 Public Input & Draft Review 8-23

8.4 What's New 8-24

8.4.1 Mitigation Activities 8-24

8.4.2 Mitigation Successes 8-26

8.5 Risk Assessment 8-30

8.5.1 Hazard Screening & Prioritization 8-30

8.5.2 Vulnerability to Specific Hazards 8-34

8.5.3 Climate Change Impacts & Vulnerable Populations 8-44

8.5.4 Hazard Problem Statements 8-45

8.6 Mitigation Strategy 8-46

8.6.1 Capabilities & Opportunities 8-47

8.6.2 NCFCWCD Mitigation Action Plan 8-58

8.6.3 Status of Previous Mitigation Actions 8-62

List of Figures

Figure 8-1: NCFCWCD Geographic Overview Map 8-10
Figure 8-2: 2022 Napa River Dredging Project 8-26
Figure 8-3: Napa River Flood Protection Project 8-28
Figure 8-4: Napa Creek 8-29
Figure 8-5: NCFCWCD Risk Assessment Matrix 8-32
Figure 8-6: NCFCWCD Flood Risk (FEMA and DWR Awareness Zones) 8-37
Figure 8-7: Exposure Summary – NCFCWCD Sea Level Rise Risk 8-43
Figure 8-8: Mitigation Action Number Key 8-58

List of Tables

Table 8-1: Napa County Income and Poverty 8-12
Table 8-2: Napa County Renter- and Owner-Occupied Housing 8-13
Table 8-3: Napa County Households with Seniors 8-14
Table 8-4: Napa County Households with Children 8-15
Table 8-5: Napa County Population with Disabilities and Access to Transportation 8-16
Table 8-6: Napa County Household Languages 8-17
Table 8-7: NCFCWCD Planning Team and Steering Group Members 8-22
Table 8-8: NCFCWCD Planning Team Meetings 8-23
Table 8-9: NCFCWCD Document Review of Potential Hazards 8-31
Table 8-10: NCFCWCD Hazards Prioritization Summary 8-33
Table 8-11: NCFCWCD Hazard Problem Statements 8-45
Table 8-12: NCFCWCD Capabilities and Opportunities Assessment 8-53
Table 8-13: NCFCWCD Mitigation Action Plan 8-60
Table 8-14: NCFCWCD Status of Previous Mitigation Actions 8-62

Adoption Resolution

To comply with the Federal Disaster Mitigation Act of 2000 (DMA 2000), The Napa County Flood Control and Water Conservation District Board of Supervisors has officially adopted this 2026 Napa County Multi-Jurisdictional Hazard Mitigation Plan, including Volume 1 in its entirety as well as this Volume 2 municipal annex. The adoption of the MJHMP recognizes the district's commitment to reducing the impacts of natural hazards within its jurisdiction and across Napa County.

A copy of the district's adoption record is provided on the following pages. Adoption records for all jurisdictions are summarized in Volume 1, Table ES-1.

ADOPTION RECORD TO BE INSERTED UPON COMPLETION.

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Section 8. Napa County Flood Control & Water Conservation District

8.1 Scope & Purpose

This Jurisdictional Annex for the Napa County Flood Control and Water Conservation District (NCFCWCD) of the 2026 Napa County Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) details the hazard mitigation planning elements specific to the district's planning area. The annex is not intended to be a standalone document but appends to and supplements the information contained in the umbrella plan document (Volume 1). As such, all sections of the umbrella plan, including the planning process and other procedural requirements, apply to and were met by the district. This annex provides additional information specific to the district, with a focus on hazard identification and risk assessment, vulnerability assessment, problem statements, mitigation strategy, and capabilities assessment. Below are NCFCWCD's Points of Contact:

Primary Point of Contact	Alternate Point of Contact
Jeremy Sarrow, Watershed & Flood Control Operations Manager Napa County Flood Control and Water Conservation District 804 First Street Napa, CA 94559 Telephone: (707) 259-8600 email: jeremy.sarrow@countyofnapa.org	Andrew Butler, District Engineer Napa County Flood Control and Water Conservation District 804 First Street Napa, CA 94559 Telephone: (707) 259-8600 email: andrew.butler@countyofnapa.org

8.2 Jurisdictional Setting

NCFCWCD is a special district within the County of Napa, California, responsible for flood risk management, watershed stewardship, stormwater controls, and coordinated water planning across the entire county. Established to serve both incorporated cities and unincorporated areas of Napa County, the District's core mission is to protect lives and property by managing flood and storm waters in an environmentally sound manner and supporting sustainable water supply planning for the community. The district oversees a range of watershed and watershed-related infrastructure programs and serves as the local sponsor for the Napa River Flood Management Plan, a comprehensive approach to long-term flood protection and river corridor restoration along the Napa River and its tributaries.

NCFCWCD was created under the Napa County Flood Control and Water Conservation District Act of 1951, establishing it as an independent local public agency tasked with flood control, watershed management, and water supply planning for Napa County.

Originally governed solely by the Napa County Board of Supervisors acting ex officio, the district's governance structure was expanded in 1996 to include representatives from across the county. Governance of the NCFCWCD is vested in an 11-member Board that incorporates both countywide and municipal representation, reflecting the regional scope of its responsibilities. The membership includes the five members of the Napa County Board of Supervisors, the mayors of Napa County's five incorporated cities (Napa, St. Helena, American Canyon, Yountville, and Calistoga), and one additional member from the Napa City Council. This structure ensures that decisions regarding flood and watershed management reflect broad community interests and integrate policy priorities from both county and city levels. Meeting agendas, resolutions, and actions are published through County channels to provide transparency and public access to governance decisions.

The district's functional responsibilities extend to the sponsorship and implementation of major flood protection projects, most notably the Napa River/Napa Creek Flood Protection Project, which is designed to reduce flood risk along the Napa River corridor through a combination of structural and non-structural measures. In addition to flood risk reduction, NCFCWCD administers watershed management programs that are intended to protect surface water resources, reduce erosion and sedimentation, and promote healthy watershed processes countywide. The district's involvement in stormwater management supports compliance with state and regional regulatory requirements and local stormwater quality objectives. It also serves as a coordinating entity in water supply planning and contract administration, working collaboratively with other agencies to support sustainable water resources for residents, agriculture, and industry.

The district's jurisdictional coverage area spans all of Napa County, extending countywide and encompassing both incorporated cities and unincorporated areas. According to the Napa Local Agency Formation Commission (LAFCO), this service area covers approximately 506,517 acres, which is equivalent to roughly 792 square miles. The district routinely partners with federal entities, including the U.S. Army Corps of Engineers on authorized flood protection initiatives, and collaborates with the Napa County Flood Protection and Watershed Improvement Authority to facilitate funding and fiscal oversight of regional projects. Local municipalities also coordinate with the district on planning, operations, and emergency response to ensure that flood and stormwater issues are addressed consistently across jurisdictional lines.

NCFCWCD's location within Napa County and the State of California are shown in Figure 8-1.

- **Year of Incorporation:** 1996
- **2023 Population Served:** ~137,381 (CAS 5-Year, 2018-2023)
- **Coverage Area:** ~790 square miles

8.2.1 Geography & Climate

NCFCWCD is located within Napa County, California, a region characterized by diverse topography, water resources, and climatic influences. Napa County encompasses approximately 789 square miles, of which about 748 square miles is land and approximately 40 square miles (5.1%) is water, including rivers, lakes, and reservoirs that contribute to its watershed systems. Elevation varies widely across the county, from sea

level in the Napa Valley floor to Mount Saint Helena at around 4,344 feet and includes both the Mayacamas Mountains to the west and the Vaca Range to the east. (U.S. Census Bureau. "Napa County, 2025)

The Napa Valley, which forms the central corridor of the county, is bounded by mountain ranges that influence both watershed dynamics and climate patterns. Elevations within the valley floor typically range from sea level to several hundred feet, with higher slopes and ridges rising into cooler, wetter conditions. This varied topography contributes to a diversity of microclimates and seasonal weather variations, which are particularly important for local ecosystems, agriculture, and flood behavior.

The climate across Napa County is generally classified as Mediterranean, characterized by warm, dry summers and mild, wetter winters. Most annual precipitation occurs as rainfall primarily between late fall and early spring, with the rainy season typically extending from around November through April. Peak rainfall is usually observed in the winter months, while summer is marked by prolonged dry conditions with minimal precipitation. Napa's Mediterranean climate also creates pronounced seasonal temperature changes; summer daytime temperatures often climb into the 70s and low 80s Fahrenheit, while winter lows average in the 30s to 40s Fahrenheit. Annual precipitation averages approximately 20 to 25 inches across the region, though totals vary with elevation and terrain.

The proximity of Napa County to the Pacific Ocean and the influence of San Pablo Bay help moderate temperature extremes and contribute to coastal fog penetration into the valley, especially in the summer months. These marine influences are more pronounced on the western side of the county near San Pablo Bay, while inland areas and higher elevations can experience greater diurnal temperature variation. The combined effects of terrain and coastal proximity foster a range of localized climate zones that affect everything from vegetation patterns to runoff processes and flood risk.

Together, the distinct geography and Mediterranean climate of Napa County shape the environmental conditions within the flood control district's jurisdiction. These characteristics influence watershed hydrology, seasonal flood risk, water supply variability, and long-term climatic trends.

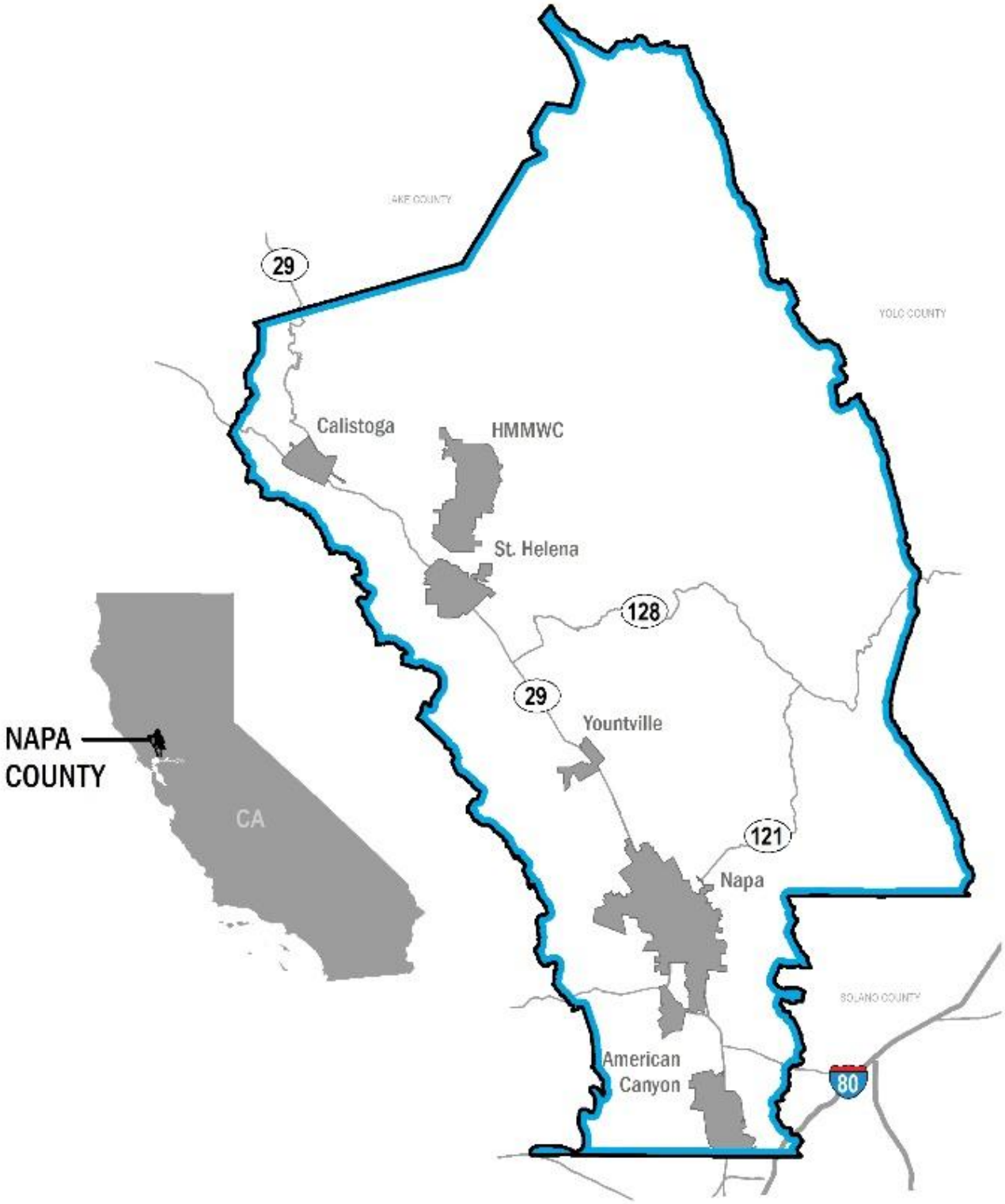


Figure 8-1: NCFCWCD Geographic Overview Map

8.2.2 Demographics & Vulnerable Populations

Napa County, which encompasses the full service area of the NCFCWCD, is home to a diverse and dynamic population. The county's population includes a mix of age groups, family types, and economic profiles. While much of the county's workforce and households enjoy relatively stable economic conditions, there remain portions of the population with characteristics that can increase vulnerability during natural hazards or disasters.

Among the characteristics relevant to hazard planning are the proportions of older adults and children, both of whom may require additional support during emergencies due to mobility, dependency, or caregiver needs. Older residents, in particular, may face challenges related to evacuation, medical needs, or extreme weather exposure. Similarly, households with young children often depend on stable care environments and services that can be disrupted during hazard events. While exact percentages vary with new census updates, these age groups represent significant segments of the community and are commonly recognized as populations with increased support needs in emergency planning.

Economic diversity within Napa County influences how different segments of the population experience disaster risk. Median household income in the county generally exceeds statewide averages, but it also masks variability among households. Some families and individuals contend with housing affordability challenges, limited financial reserves, or employment in sectors vulnerable to disruption during hazard events. Households with limited economic capacity may have fewer resources for preparedness measures, recovery costs, or access to private transportation, affecting their resilience in the face of floods, wildfires, or other hazards.

Language and cultural diversity also shape how information is accessed and acted upon during emergencies. A meaningful portion of Napa County residents speak languages other than English at home, and some residents are foreign-born, factors that can influence timely access to emergency alerts, preparedness resources, and community outreach efforts. Ensuring that communications are accessible and culturally appropriate is an important component of equitable hazard mitigation.

Other populations that may experience increased vulnerability include individuals with disabilities, households without reliable transportation, and residents living in rental or lower-income housing. While countywide data does not pinpoint specific counts for every subgroup, these broader demographic trends are consistent with social vulnerability frameworks used in emergency management planning and should be considered when identifying needs and prioritizing mitigation strategies.

8.2.2.1 Income & Housing

The economic and housing characteristics of Napa County play a critical role in shaping community vulnerability and resilience to natural hazards within the jurisdiction of the Napa County Flood Control and Water Conservation District. While Napa County overall demonstrates relatively strong economic indicators, variations in income levels, poverty rates, housing tenure, and rental occupancy patterns influence how different communities experience and recover from hazard events.

Median household income levels, as shown in Table 8-1, vary considerably across Napa County jurisdictions. Countywide, the median household income is approximately $105,809, with a poverty rate of 7.9 percent. Among incorporated jurisdictions, income levels range from approximately $75,134 in the Town of Yountville to $135,781 in the City of St. Helena. Poverty rates also vary, with the Town of Yountville exhibiting the highest poverty rate at 10.6 percent, while the City of Calistoga reports a comparatively lower poverty rate of 5.4 percent. These differences are significant in hazard mitigation planning, as income levels influence household capacity to prepare for disasters, maintain insurance coverage, implement mitigation measures, and recover following hazard events. Households with limited economic resources are generally more vulnerable to displacement, property loss, and prolonged recovery periods following flooding, severe storms, wildfires, or other disasters.

Table 8-1: Napa County Income and Poverty

Area	Median Income	Poverty Rate
Napa County (Unincorporated)	**$105,809**	**7.9%**
American Canyon	$122,694	7.4%
Calistoga	$96,667	5.4%
Napa (City)	$100,273	8.1%
St. Helena	$135,781	5.7%
Yountville	$75,134	10.6%

Source: ACS 5-Year, 2017-2022

Housing tenure patterns shown in Table 8-2 further illustrate variations in community vulnerability. Across Napa County, approximately 49,738 housing units are occupied, of which 35.5 percent are renter-occupied and 64.5 percent are owner-occupied. Rental occupancy rates vary among jurisdictions, with renter-occupied housing comprising approximately 39.4 percent of units in the City of Napa, 40.3 percent in the City of Calistoga, and 44 percent in the City of St. Helena. By comparison, the City of American Canyon demonstrates a lower renter occupancy rate at 22.1 percent, indicating a higher proportion of owner-occupied housing.

These housing dynamics are relevant to hazard vulnerability because renters often face distinct challenges during disasters. Renter households typically have less control over structural mitigation measures, may lack adequate renter's insurance, and are more susceptible to displacement following hazard-related damage. Communities with higher renter occupancy rates may therefore experience increased housing instability and longer recovery timelines following major hazard events. Conversely, higher owner-occupancy rates may correlate with greater long-term investment in property maintenance and mitigation, although lower-income homeowners may still face financial constraints.

In addition to tenure patterns, the distribution of income and poverty across jurisdictions influences the spatial distribution of vulnerability. Jurisdictions with lower median incomes or elevated poverty rates may

face greater constraints in implementing hazard mitigation measures, particularly those requiring private financial investment, such as structural retrofits, floodproofing, or defensible space improvements. These economic and housing factors intersect with hazard exposure, particularly in flood-prone or hazard-susceptible areas.

Table 8-2: Napa County Renter- and Owner-Occupied Housing

Area	Total Occupied Housing Units	Renter	Rent %	Owner	Own %
Napa County (Unincorporated)	**49,218**	**17,142**	**35%**	**32,076**	**65%**
American Canyon	5,725	1,205	21%	4,520	79%
Calistoga	2,116	776	37%	1,340	63%
Napa (City)	29,443	12,052	41%	17,391	59%
St. Helena	2,466	792	32%	1,674	68%
Yountville	1,516	514	34%	1,002	66%

Source: ACS 5-Year, 2017-2022

8.2.2.2 Dependent & Disabled Populations

Population characteristics associated with age, independence, and economic stability are important indicators of potential vulnerability within Napa County and the jurisdiction of the Napa County Flood Control and Water Conservation District. Older adults, particularly those living alone or experiencing poverty, may face elevated risk during hazard events due to mobility limitations, medical needs, social isolation, and reduced capacity to prepare for or recover from disasters.

Across Napa County, households with residents aged 65 years and older represent a substantial portion of the population. Countywide, approximately 33.8 percent of households include at least one resident aged 65 or older, reflecting the county's relatively mature population profile, Table 8-3. Within incorporated jurisdictions, the proportion of households with older residents varies considerably. The Town of Yountville and the City of Calistoga exhibit particularly high concentrations of older adults, with approximately 47.9 percent and 43.0 percent of households, respectively, including residents aged 65 and older. The City of St. Helena also demonstrates a comparatively elevated proportion at 38.9 percent.

Of particular relevance to hazard mitigation planning are households where older adults live alone, as these residents may face increased challenges during emergencies. Countywide, approximately 8.7 percent of households consist of individuals aged 65 or older living alone. This proportion is significantly higher in certain jurisdictions, including the Town of Yountville (19.2 percent) and the City of Calistoga (18.0 percent). Older adults living alone may experience heightened vulnerability during hazard events due to reduced access to assistance, delayed evacuation, or difficulties receiving emergency communications.

Economic factors further influence vulnerability among older populations. Countywide, approximately 2.3 percent of households include residents aged 65 or older living below the poverty level. While this

percentage is relatively modest at the county level, higher concentrations are observed in specific jurisdictions, including the City of Calistoga (4.3 percent) and the Town of Yountville (4.2 percent). Older adults experiencing poverty may face compounded vulnerability due to limited financial resources, reduced housing stability, and constraints on preparedness or recovery expenditures.

Table 8-3: Napa County Households with Seniors

		Households with 65+					
Area	Households	65+	%	65+ Alone	%	65+ Poverty	%
Napa County (Unincorporated)	**55,588**	**18,777**	**33.8%**	**4,816**	**8.7%**	**1,271**	**2.3%**
American Canyon	5,924	1,772	29.9%	184	3.1%	111	1.9%
Calistoga	2,330	1,003	43.0%	419	18.0%	101	4.3%
Napa (City)	31,666	10,299	32.5%	2,674	8.4%	703	2.2%
St. Helena	2,963	1,153	38.9%	296	10.0%	42	1.4%
Yountville	1,824	873	47.9%	351	19.2%	77	4.2%

Source: ACS 5-Year, 2017-2022

Households with residents under the age of 18 represent a significant portion of Napa County's population profile. Countywide, approximately 26.3 percent of households include individuals under 18 years of age, reflecting the presence of families with dependent children, Table 8-4. The proportion of households with children varies notably among jurisdictions. The City of American Canyon exhibits the highest concentration, where approximately 44.4 percent of households include residents under 18, indicating a community with a comparatively high number of families and dependent populations. The City of Napa also reflects a substantial share at 28.2 percent.

Particularly relevant for hazard planning are households headed by a single caregiver with children, as these households may face additional constraints during emergencies. Countywide, approximately 5.6 percent of households are classified as single-caregiver households with residents under 18. This proportion is elevated in certain jurisdictions, including the City of Napa (7.3 percent) and American Canyon (7.0 percent). Single-caregiver households may encounter greater challenges related to evacuation, childcare, employment disruption, and recovery capacity following hazard events.

Table 8-4: Napa County Households with Children

		Households with Children <18			
Area	Households	<18	%	<18 Single Caregiver	%
Napa County (Unincorporated)	**55,588**	**14,596**	**26.3%**	**3,109**	**5.6%**
American Canyon	5,924	2,633	44.4%	417	7.0%
Calistoga	2,330	471	20.2%	33	1.4%
Napa (City)	31,666	8,934	28.2%	2,315	7.3%
St. Helena	2,963	619	20.9%	168	5.7%
Yountville	1,824	160	8.8%	0	0.0%

Source: ACS 5-Year, 2017-2022

In addition to dependent children, Napa County includes a meaningful population of individuals with disabilities, shown in Table 8-5. Countywide, approximately 12.0 percent of residents report having a disability, with higher concentrations observed in certain jurisdictions. The Town of Yountville, for example, exhibits a notably elevated proportion at 20.1 percent, reflecting the community's older demographic composition. Individuals with disabilities may experience increased vulnerability during hazard events due to mobility limitations, medical dependencies, communication barriers, and the need for accessible facilities or transportation.

Transportation access represents another important determinant of vulnerability. Countywide, approximately 4.4 percent of households do not have access to a vehicle, with higher proportions present in certain jurisdictions, including Yountville (11.5 percent) and St. Helena (7.4 percent). Households without vehicles may face increased evacuation challenges during rapidly developing hazard events such as flooding or wildfire. Similarly, a subset of residents are reliant on public transportation, which may be disrupted during emergencies. While the proportion of persons dependent on public transit is relatively small at the county level (0.6 percent), localized concentrations may influence evacuation logistics and emergency mobility planning.

Table 8-5: Napa County Population with Disabilities and Access to Transportation

Area	Population	Persons w Disability	%	Persons Reliant on Public Trans.	%	Households	HH w No Vehicle	%
Napa County	**137,384**	**16,544**	**12.0%**	**890**	**0.6%**	**55,588**	**2,421**	**4.4%**
American Canyon	21,669	2,201	10.2%	287	1.3%	5,924	138	2.3%
Calistoga	5,191	573	11.0%	36	0.7%	2,330	83	3.6%
Napa (City)	79,233	9,837	12.4%	291	0.4%	31,666	1,554	4.9%
St. Helena	5,426	683	12.6%	121	2.2%	2,963	219	7.4%
Yountville	3,397	683	20.1%	15	0.4%	1,824	210	11.5%

Source: ACS 5-Year, 2017-2022

These demographic and functional characteristics highlight important spatial variations in vulnerability across Napa County. Communities with higher concentrations of dependent children, single-caregiver households, individuals with disabilities, and households without vehicles may face elevated challenges during hazard events. These populations may require additional consideration in emergency preparedness, evacuation planning, sheltering strategies, and recovery assistance programs.

8.2.2.3 Race, Ethnicity & Language

NCFCWCD's service area is characterized by substantial racial, ethnic, and cultural diversity. There are several areas in the county with higher concentrations of Hispanic or Latino residents, particularly in the central and southern Napa Valley, while other areas are characterized by predominance of White or Asian residents. Smaller but meaningful concentrations of additional racial and ethnic groups are distributed throughout the county. This diversity is especially pronounced in communities such as American Canyon, which is widely recognized as one of the most demographically diverse jurisdictions within Napa County.

Natural disasters compound racial disparities; non-white individuals and communities receive less recovery aid from FEMA than their white counterparts, even where the amount of damage is the same. (Howell, Junia; Elliott, James R., 2019) (National Advisory Council, 2020) These disparities are evidence of the complicated relationship between disaster recovery and overlapping social vulnerabilities including race, income, language, and health. Black and Latino residents are more likely to be low income and renters, conditions which create barriers to navigating FEMA's Individual Assistance programs. Communities with more non-white residents may have lower tax revenue and property values, which means less investment in mitigation and rebuilding efforts before and after an emergency.

Demographic characteristics related to language proficiency and cultural diversity are important considerations in hazard mitigation planning, as they influence how residents receive, interpret, and respond to emergency information. Within Napa County and the jurisdiction of the Napa County Flood

Control and Water Conservation District, variations in language use and English proficiency may affect emergency communications, evacuation behavior, and access to disaster assistance.

Across Napa County, a substantial portion of households report speaking Spanish at home. Countywide, approximately 15.7 percent of households are Spanish speaking, reflecting the county's significant Hispanic and Latino population. Spanish-speaking households are present throughout the county, with higher concentrations observed in several incorporated jurisdictions, shown in Table 8-6. The City of Napa and American Canyon each report Spanish-speaking households comprising approximately 18 to 20 percent of total households, while the City of Calistoga exhibits a slightly higher proportion at approximately 20.3 percent.

Language proficiency is particularly relevant when evaluating households with limited English proficiency (LEP). Countywide, approximately 3.9 percent of households are classified as limited English-speaking, indicating that one or more household members may experience difficulty communicating effectively in English. The City of Napa demonstrates a comparatively higher concentration of LEP households at approximately 5.2 percent, while other jurisdictions, including American Canyon, Calistoga, and St. Helena, report LEP rates closer to the countywide average.

Households with limited English proficiency may face increased vulnerability during hazard events due to potential barriers in accessing emergency alerts, preparedness information, evacuation instructions, and recovery resources. Timely comprehension of hazard warnings is critical during rapidly developing events such as flooding or wildfire, where delayed understanding can increase risk. Language barriers may also affect access to disaster assistance programs, insurance claims processes, and post-disaster recovery services.

While households speaking languages other than English or Spanish represent a comparatively small portion of the population, language diversity remains an important planning consideration. Even relatively small LEP populations may require targeted outreach strategies to ensure equitable access to emergency information and services.

Table 8-6: Napa County Household Languages

Area	Households (HH)	Spanish Speaking	%	Limited English	%
Napa County	**55,588**	**8,738**	**15.7%**	**2,141**	**3.9%**
American Canyon	5,924	1,069	18.0%	177	3.0%
Calistoga	2,330	474	20.3%	63	2.7%
Napa (City)	31,666	5,800	18.3%	1,653	5.2%
St. Helena	2,963	370	12.5%	88	3.0%
Yountville	1,824	49	2.7%	21	1.2%

Source: ACS 5-Year, 2017-2022

8.2.2.4 Social Vulnerability Index (SVI)

The Centers for Disease Control and Prevention (CDC) Social Vulnerability Index (SVI) for Napa County reveals important spatial and demographic patterns that have direct implications for equitable hazard mitigation planning. As discussed in detail in Volume 1, Section 1.4.3.6, the SVI is a composite measure developed by the CDC to identify communities that are more likely to require support before, during, and after a disaster. It incorporates a range of factors across four key dimensions: socioeconomic status, household composition and disability, minority status and language, and housing type and transportation access. The resulting index score ranges from 0 (lowest vulnerability) to 1 (highest vulnerability).

The predominance of lower SVI values is consistent with other demographic indicators observed within the service area, including higher median household incomes, relatively low poverty rates, and high owner-occupancy levels. Lower social vulnerability scores often suggest increased household capacity to absorb certain economic shocks, access insurance mechanisms, and implement preparedness measures. However, social vulnerability is multifaceted, and lower composite scores do not eliminate hazard exposure or risk. In geographically constrained mountain communities, physical isolation, terrain-driven infrastructure limitations, and hazard intensity may offset aspects of socioeconomic capacity.

Within Napa County, demographic patterns indicate variability in several indicators that contribute to social vulnerability. A meaningful portion of the population includes older adults, dependent children, and individuals with disabilities, groups that the SVI identifies as at potentially increased risk during hazard events due to functional, health, or mobility needs. Additionally, households with limited English proficiency, those without a vehicle, and households with a single caregiver represent social conditions that correlate with higher SVI rankings. These characteristics are important for the district to consider in flood risk communication, evacuation planning, sheltering support, and recovery assistance.

From an economic perspective, disparities in median household income and poverty rates across jurisdictions within Napa County also align with SVI themes. Jurisdictions with lower income levels and higher poverty rates may have reduced capacity for hazard preparedness investments, insurance coverage, or post-disaster recovery expenditures, further emphasizing social vulnerability considerations in mitigation planning.

Housing type and transportation, another SVI theme, are also relevant to the district's planning area. Higher proportions of renter-occupied housing and households without personal vehicles may present challenges during rapid evacuation or sheltering in place during flood events. Renters, in particular, may have less control over structural mitigation measures and reduced capacity to invest in pre-event floodproofing improvements.

While the SVI offers a standardized way to gauge social vulnerability, it is most informative when paired with local demographic data such as that presented in this plan (e.g., household age, disability status, language proficiency, vehicle access, income, and housing tenure). Collectively, these indicators provide a nuanced understanding of areas and population segments within Napa County that may be at comparatively greater social vulnerability during flood events or other hazards.

8.2.3 Economy

NCFCWCD operates within Napa County, a regional economy shaped by a combination of agriculture, tourism, government services, healthcare, and commercial activity. The county's economic profile is strongly influenced by its nationally recognized wine industry, which plays a central role in employment, land use, infrastructure demand, and hazard exposure.

Agriculture represents a foundational component of the county's economy, with viticulture serving as the dominant agricultural sector. Vineyards and wineries contribute significantly to local employment, revenue generation, and tourism activity. The agricultural economy is closely tied to environmental conditions, including precipitation patterns, water availability, temperature variability, and hazard events such as flooding, drought, and wildfire. Disruptions to agricultural production caused by natural hazards can produce cascading economic effects, including revenue loss, workforce impacts, and infrastructure strain.

Tourism and hospitality form another critical pillar of Napa County's economy. The region attracts substantial visitor activity associated with wineries, culinary destinations, lodging, and recreational amenities. This visitor-serving economy supports a wide range of businesses, including hotels, restaurants, retail establishments, and transportation services. Hazard events, particularly floods, wildfires, severe storms, and extreme heat, can significantly affect tourism by disrupting transportation networks, damaging facilities, and reducing visitor confidence. Because tourism activity is geographically concentrated in valley corridors and urban centers, hazard impacts may create localized but economically significant consequences.

Government, public administration, and institutional services also represent a stable component of the county's economic structure. Public agencies, educational institutions, and local government operations provide employment and essential services throughout the county. NCFCWCD itself contributes to economic stability by supporting flood protection, watershed management, and infrastructure resilience, which help reduce economic losses associated with hazard events.

Healthcare and social assistance sectors are increasingly important contributors to employment within Napa County. These services support both resident populations and visitor activity, while also playing a vital role during emergencies and disaster recovery. Hazard events may increase demand for healthcare services, particularly among vulnerable populations, while also posing risks to facility operations and accessibility.

While Napa County generally demonstrates strong economic indicators relative to broader regional averages, income variability, housing costs, and employment distribution patterns influence economic resilience across communities. Certain sectors, including agriculture, hospitality, and small businesses, may be particularly sensitive to hazard disruptions. Economic losses from hazard events may include direct damages to property and infrastructure, business interruption costs, workforce displacement, and reduced revenue generation.

From a hazard mitigation perspective, the county's economic structure presents both strengths and vulnerabilities. Economic diversity provides some resilience, while sector-specific dependencies and geographic concentrations of activity may amplify hazard impacts. Flooding, in particular, represents a key economic risk given its potential to affect transportation corridors, commercial districts, agricultural lands, and visitor-serving areas.

8.2.4 Growth Trends & Future Development

NCFCWCD encompasses all of Napa County, a region that has experienced modest but steady population and development growth over recent decades. Growth patterns in the county are shaped by a mix of agricultural preservation policies, land use designations that protect open space and viticultural lands, and localized intensification within incorporated cities and urbanized corridors. This combination has resulted in relatively moderate population increases compared with rapidly growing regions in the state, while also concentrating residential and commercial development in established communities.

Population growth in Napa County has generally occurred at a gradual pace, with demographic trends pointing toward continued increases in the number of county residents, albeit at a slower rate than many areas in the San Francisco Bay Area corridor. New housing construction, infill development, and redevelopment within urban and suburban areas of cities such as Napa, American Canyon, and St. Helena contribute to this trend. Growth has often been supported by economic activity tied to tourism, wine production, and service sectors, which sustain demand for housing and related services. As noted earlier, median household incomes and housing costs in many parts of the county are above regional averages, and this economic context can influence the pace and pattern of development.

Local land use policies and planning frameworks play a central role in shaping future development. The Napa County General Plan and individual city general plans emphasize agricultural land protection, open space conservation, and managed growth within designated urban limits. These policies limit extensive outward expansion by prioritizing the preservation of productive agricultural lands and environmentally sensitive areas. Growth is typically directed toward established urban boundaries, where infrastructure capacity, including water, sewer, transportation, and flood control systems, can be supported more effectively. However, even relatively contained growth can increase exposure to natural hazards if new development occurs in areas with defined flood risk, steep slopes, or near critical infrastructure.

Future projections for housing and commercial development anticipate continued demand for residential units, particularly rental housing and housing affordable to key workforce segments. This demand is reflected in ongoing planning efforts to increase housing supply within cities like Napa and American Canyon. As housing stock increases, attention to hazard risk during the planning and permitting process becomes increasingly important. Ensuring that new development incorporates appropriate mitigation measures, including flood risk reduction, stormwater management, and resilient infrastructure design, supports long-term community safety and reduces potential future losses.

Infrastructure investment also reflects growth trends. Upgrades to transportation corridors, storm drains, and flood control facilities are ongoing priorities to accommodate existing needs and anticipate future demands. The Napa County Stormwater Management Program and initiatives aligned with the Napa River Flood Protection Project exemplify multi-jurisdictional efforts to integrate hazard mitigation into infrastructure planning, particularly as urbanized areas continue to evolve.

Climate change considerations further influence growth and development planning. Anticipated increases in extreme precipitation events, rising temperatures, and wildfire risk have prompted planners to reassess traditional development practices and incorporate resilience principles into comprehensive planning frameworks. Projects that enhance natural systems' ability to absorb runoff, protect steep slopes, and maintain watershed function are increasingly prioritized in policy discussions.

8.3 Planning Process

NCFCWCD followed the planning process detailed in Volume 1, Section 2, including participating in the county-wide Hazard Mitigation Planning Team (HMPT) and formulating their own internal planning team to support the broader planning process.

The district's representatives in the Steering Group led stakeholder and public engagement efforts alongside the Consultant Team, with assistance from the county-wide HMPT and their internal planning team. This engagement process is described in Volume 1. Specifically, for the district, this included postings to the district website and social media, and outreach events, as documented in Appendix B. Examples of Key Stakeholders engaged by Napa County on behalf of the district with relevance to the development of NCFCWCD's mitigation strategy include the USDA and other federal agencies; CAL FIRE and other state agencies; other jurisdictions; community-based organizations such as local Chamber of Commerce chapters; utility providers like PG&E; UC Davis and other academia; and local businesses.

All Key Stakeholders that were invited to participate in the planning process are listed in Volume 1, Section 2, and the input received from stakeholders was integrated into the district's annex, as described in Volume 1 Table 2-9. The district's internal planning team participants, their positions, and how they participated in the planning process are shown in Table 8-7.

Table 8-7: NCFCWCD Planning Team and Steering Group Members

Team Members	Title	Description of Involvement
Jeremy Sarrow	Watershed & Flood Control Operations Manager	Lead Point-of-Contact, Kickoff Meeting, HMPT #1, #2, BO #1 and #2
Andrew Butler	District Engineer	Alternate Point-of-Contact, HMPT #2, #3, BO #1 and #2
Leif Bryant	Logistics Chief	Alternate Point-of-Contact, Kickoff Meeting, HMPT, #2
Ross Murphy		Alternate Point-of-Contact, HMPT #1, #3, BO #1 and #2
Richard Thomasser	Deputy Director of Public Works / District Manager	Alternate Point-of-Contact, BO #1

NCFCWCD staff participated in a comprehensive hazard mitigation planning process as part of the 2026 Napa County MJHMP update. This included a series of breakout meetings, listed in Table 8-8 that engaged the district's planning team, which included key district personnel and stakeholders in evaluating hazards, identifying local vulnerabilities, and prioritizing mitigation strategies

The process began with a County-Wide Steering Group Kickoff Meeting on February 28, 2024. This initial meeting focused on welcoming participants, establishing a shared understanding of the project scope and schedule, clarifying roles and responsibilities of the Steering Group, the county-wide Hazard Mitigation Planning Team (HMPT), and individual jurisdictional planning teams, and included a review of key changes since the 2020 Local Hazard Mitigation Plan The meeting set the foundation for coordinated participation throughout the planning effort.

On December 10, 2025, participants engaged in a hexagon mapping activity designed to visually identify mitigation actions that could benefit from or require inter-jurisdictional coordination. These collaborative efforts helped shape a refined set of mitigation alternatives, establish shared planning goals, and align local strategies with FEMA's Hazard Mitigation Assistance (HMA) funding framework.

Throughout the series of breakout meetings, the district engaged in a structured and collaborative planning process focused on assessing hazard risks, identifying vulnerabilities, and developing targeted mitigation strategies. The meetings began with recaps of the county-wide HMPT meetings to ensure alignment of goals and progress.

During the October 23, 2024 breakout out meeting, discussions concentrated on community engagement outcomes, initial risk assessments, and the integration of demographic data to better understand vulnerable populations. Jurisdictional teams reviewed their specific hazard exposures using the Risk Assessment Mapping Platform (RAMP) and participated in prioritization exercises to identify their top hazards.

The November 4, 2025, breakout meeting shifted toward reviewing local capabilities and defining specific areas of concern, which informed the drafting of problem statements. Teams worked collaboratively to refine mitigation alternatives, align actions with FEMA guidelines, and develop a shortlist of priority mitigation actions and inter-jurisdictional collaboration opportunities.

The meetings also included consensus-building activities around hazard rankings, capabilities, and planned actions, while providing regular updates on the overall project schedule.

Table 8-8: NCFCWCD Planning Team Meetings

Meeting & Date	Agenda / Topics	Goals / Key Inputs
County-Wide Steering Group and HMPT Kick-off and Meetings #1 & #2 February 28, 2024– July 18, 2024		
NCFCWCD Planning Team Breakout Meeting #1 October 23, 2024	▪ County-wide HMPT meetings #1 and #2 recaps ▪ Community engagement progress and results ▪ Risk assessment and community vulnerability ▪ Demographics and vulnerable populations ▪ Overview of jurisdiction-specific hazard risks and exposure ▪ Introduction to Risk Assessment Mapping Platform (RAMP) ▪ Jurisdiction-specific hazard risk ranking exercise ▪ Project schedule updates and next steps	▪ Consensus on jurisdiction-specific priority hazards ▪ Identify capabilities and potential mitigation actions ▪ Community engagement volunteers
County-Wide HMPT Meeting #3 March 25, 2025		
NCFCWCD Planning Team Breakout Meeting #2 November 4, 2025	▪ Breakout Meeting #1 and HMPT #3 recaps ▪ Review capabilities assessment ▪ Review areas of concern and define problem statements ▪ Principles of effective mitigation strategies and actions, and mitigation alternatives ▪ Refine and align jurisdiction-specific mitigation actions exercise ▪ Project schedule updates and next steps	▪ Consensus on jurisdiction-specific capabilities ▪ Consensus on jurisdiction-specific areas of concern ▪ Consensus on priority mitigation actions and collaboration opportunities ▪ Community engagement volunteers
County-Wide HMPT Meeting #4 December 10, 2025		

8.3.1 Public Input & Draft Review

As detailed in Volume 1, Section 2, the draft plan was available for public review and comment from May 15 to June 2, 2026. Public comments received during that time were similar to those gathered throughout the public engagement process, including the need for more equity in the distribution of mitigation activities and funding and the need for enhanced cooperation among jurisdictions, utility providers, and state

agencies. These comments were incorporated into the city's mitigation strategy, as appropriate; although, most were already addressed by the Mitigation Action Plan which was based on previous public input.

Public and stakeholder input was gathered and incorporated throughout the plan development process, before the public review period, such as from the online public survey (see Volume 1, Section 2.1.2 and Appendix B, for details). During the review period, jurisdictional staff and stakeholders that participated in the plan development also reviewed the public draft and provided comments on minor corrections and revisions, which were addressed in the final plan.

8.4 What's New

This section provides an overview of hazard mitigation planning efforts for the planning area and highlights the updates made in the 2026 MJHMP. NCFCWCD previously participated in and maintained a Hazard Mitigation Plan, which guided resilience planning and hazard mitigation actions at the district level. NCFCWCD is updating their current plan on a county wide level. This integration reflects the district's ongoing commitment to regional resilience and acknowledges that many hazards such as coastal flooding, severe storms, and earthquakes cross jurisdictional boundaries.

Through participation in the MJHMP, NCFCWCD has identified its highest priority hazards, developed hazard specific problem statements, and proposed actionable strategies to reduce risks. By aligning with countywide partners and leveraging regional resources, NCFCWCD has strengthened its capacity to prepare for, withstand, and recover from disasters while continuing to protect its unique coastal community character.

8.4.1 Mitigation Activities

NCFCWCD administers and supports a range of programs and activities that contribute to hazard risk reduction, watershed stability, and long-term community resilience throughout Napa County. The district's mitigation efforts primarily emphasize flood risk management, watershed stewardship, and stormwater coordination, reflecting its statutory responsibilities and operational functions.

A core function of the district involves Watershed Management and Stream Maintenance, which includes the routine inspection, maintenance, and management of the Napa River and its tributaries. These activities are intended to preserve channel conveyance capacity, manage sedimentation, reduce erosion, stabilize streambanks, and minimize localized flooding risks. Stream maintenance operations serve as an important non-structural mitigation measure by addressing conditions that can exacerbate flood hazards, including debris accumulation, vegetation encroachment, and channel instability. These programs are supported through a combination of local assessments, State funding, and federal grant resources, enabling the district to maintain watershed infrastructure and functions on a countywide basis.

To guide these efforts, the district has updated its Stream Maintenance Program (SMP) Manual, which establishes the organizational and operational framework governing routine stream maintenance activities. The SMP provides standardized procedures, environmental protection measures, and regulatory

compliance mechanisms designed to balance hazard mitigation objectives with environmental stewardship. As part of this update, the district conducted environmental review consistent with the California Environmental Quality Act (CEQA). The district determined that implementation of the updated program could result in potentially significant but mitigable environmental effects and subsequently adopted a Mitigated Negative Declaration.

Stormwater management represents another important mitigation-related function within the district's jurisdiction. Napa County and its incorporated cities, including American Canyon, Napa, St. Helena, Calistoga, and the Town of Yountville, collectively administer the Napa County Stormwater Pollution Prevention Program. This regional program supports water quality protection, runoff management, and compliance with State and federal stormwater regulations. Effective stormwater controls contribute to hazard mitigation by reducing localized flooding, managing peak runoff, and preserving watershed stability. Coordination among jurisdictions supports consistent regulatory implementation and promotes integrated watershed management strategies.

The district also contributes to broader Water Resources planning and management efforts throughout Napa County. These activities support long-term water supply reliability, watershed function, and infrastructure resilience. Integrated water resources planning provides an important mitigation benefit by addressing hydrologic variability, drought conditions, and changing climate patterns that influence flood behavior, runoff dynamics, and system performance.

Groundwater resources and sustainability initiatives within Napa County are administered through the Planning, Building, and Environmental Services Department, reflecting a coordinated, multi-agency approach to water management. Although groundwater management is not a direct District function, groundwater sustainability efforts intersect with hazard mitigation objectives, particularly in relation to drought resilience, watershed stability, and the long-term protection of water resources.

Adjustments to Previous Mitigation Actions

Some of NCFCWCD's mitigation efforts remain ongoing or in the pipeline. These actions, ranging from infrastructure upgrades to restoration initiatives, represent the district's proactive approach to addressing hazards as resources become available.

Recognizing constraints such as limited funding, staffing, and shifting priorities, the district has reevaluated certain initiatives, leading to their reprioritization or canceling of mitigation actions. Factors such as feasibility, cost-effectiveness, and emerging risks informed these decisions, ensuring alignment with the city's updated hazard mitigation goals. Adjustments to previous mitigation actions are documented as part of the NCFCWCD's Mitigation Action Plan (Table 8-13), and more specific status updates are provided in Table 8-14.

8.4.2 Mitigation Successes

Since the adoption of the 2021 Hazard Mitigation Plan, NCFCWCD has made measurable progress in implementing mitigation actions that reduce risk and enhance community resilience. These successes reflect the district's continued commitment to integrating hazard mitigation into local planning, capital improvement projects, and community programs.

The following success stories highlight completed and ongoing efforts that address key hazards such as wildfire, flooding, and infrastructure vulnerability. Collectively, these initiatives demonstrate the city's ability to move from planning to implementation by leveraging partnerships, securing funding, and advancing projects that provide long-term risk reduction benefits to the community.

Napa Dredging Project

The 2022 Napa River Operations and Maintenance (O&M) Dredging Project was conducted through a partnership between the U.S. Army Corps of Engineers (USACE) San Francisco District and the NCFCWCD. The project was part of the Corps' Navigation Program, which focuses on maintaining safe and reliable waterways that support commerce, recreation, and public safety.

The project involved dredging portions of the Napa River navigation channel in Napa, California to restore channel depth and maintain navigability. Approximately 75,000 cubic yards of sediment were planned to



Figure 8-2: 2022 Napa River Dredging Project

be removed from the river. The dredging targeted two main channel depths: approximately 10 feet in the upper reach and 15 feet in the lower reach, measured relative to mean lower low water.

Dredging operations used a clamshell dredge, which was selected because the river contains coarse sediment and debris that are not well suited to hydraulic pipeline dredging methods. Material removed from the channel was loaded onto scows (barges) and transported to an offloading site at Coombs, where the sediment was transferred and hauled by truck to the South Jefferson placement site. Approximately 52,000 cubic yards of dredged material were expected to be placed at the disposal site.

Work was scheduled within an environmental operating window between August 1 and November 30, with active dredging anticipated to occur between mid-August and early November, lasting roughly six to nine weeks. Working hours varied depending on the location along the river corridor. In the downtown business district near 3rd Street, dredging was limited to weekday daytime hours, while residential areas allowed slightly longer daily operations and non-residential sections permitted extended or continuous work schedules.

Pre-construction activities included environmental approvals, contractor solicitation, and contract award prior to the start of dredging operations. The project also included defined dredging reaches along the upper portion of the Napa River, identified through hydrographic surveys conducted in February 2022 that documented sediment accumulation within the navigation channel.

Napa River & Creek Flood Protection Project

One of the District's most significant mitigation initiatives is the Napa River and Creek Flood Protection Project, a comprehensive, multi-benefit flood management program. This project is designed to provide protection from 100-year flood events while integrating ecosystem restoration objectives. The project includes the restoration of more than 900 acres of high-value tidal wetlands within the San Francisco Bay Estuary, reflecting a balanced approach that combines flood risk reduction with environmental enhancement. In addition to ecological benefits, the project is designed to protect approximately 2,700 homes, 350 businesses, and more than 50 public properties from major flood events. The economic benefits associated with reduced flood damages are substantial, with estimated avoided losses of approximately $26 million annually in flood damage costs. This project represents a cornerstone mitigation investment that directly supports life safety, property protection, infrastructure resilience, and environmental sustainability.

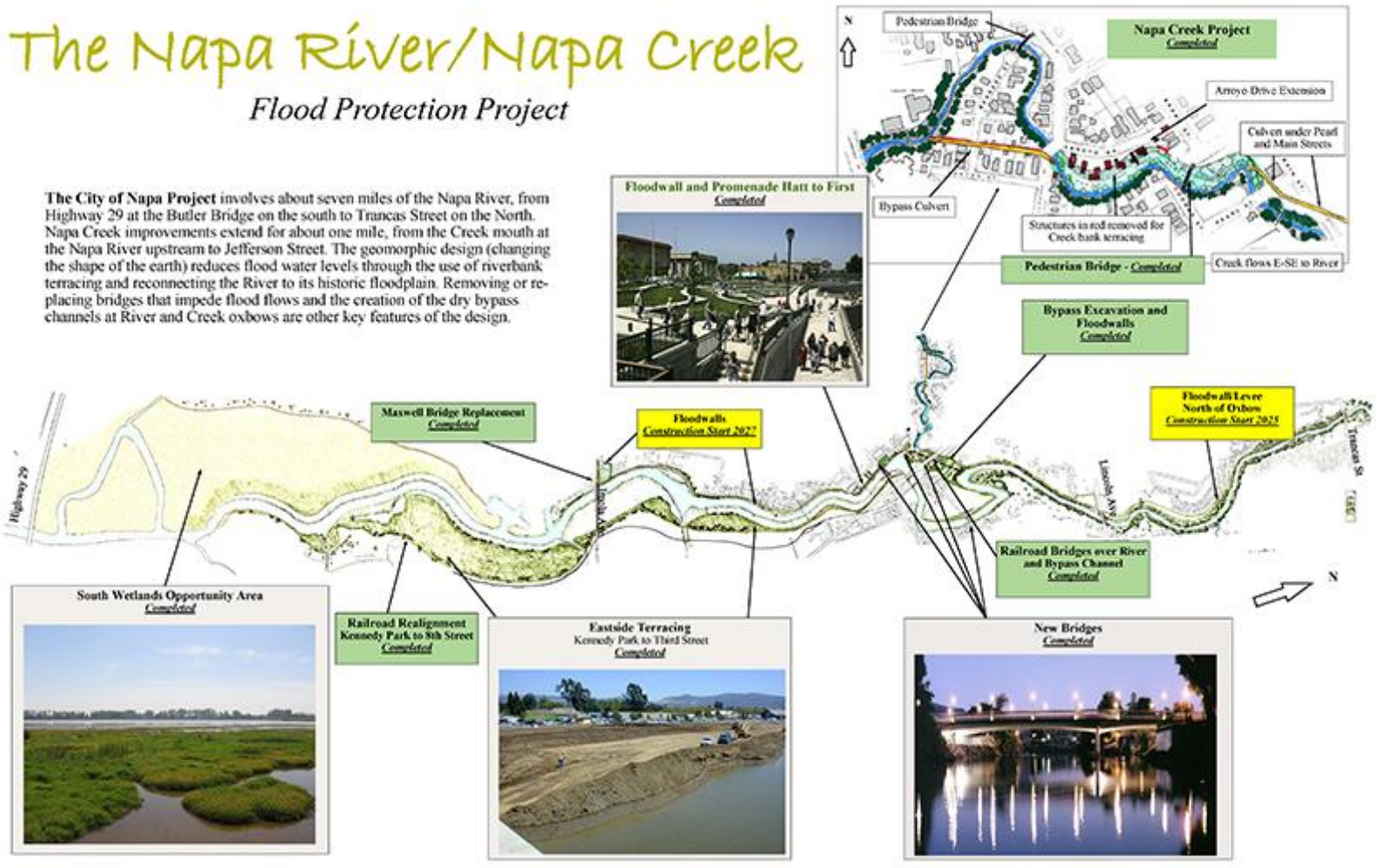


Figure 8-3: Napa River Flood Protection Project

Watershed Management & Stream Maintenance

The NCFCWCD manages a comprehensive watershed management program designed to reduce flood risk, protect water resources, and maintain the ecological health of local waterways. Key activities include maintaining approximately 13 miles of district-owned channels, addressing problem areas along the Napa River and its tributaries, dredging sections of the river to maintain conveyance capacity, and repairing and stabilizing streambanks. The district also operates a countywide flood early warning system, supports installation and replacement of major storm drain trunk lines, and participates in federal and state flood protection grant programs to implement mitigation projects and watershed improvements.

In addition to infrastructure maintenance, the district conducts groundwater monitoring, oversees adjudicated watersheds, and prepares technical studies related to flood protection and watershed management. The district also works collaboratively with local agencies and communities to implement

floodplain management regulations and comply with National Pollutant Discharge Elimination System (NPDES) stormwater requirements. Through its Stream and Watershed Maintenance Program, the District uses an adaptive management approach that balances flood protection with habitat preservation and riparian ecosystem health.

The program emphasizes stewardship of Napa County's streams and rivers through coordinated maintenance, habitat restoration, and invasive plant management. To guide these activities, the District developed the Napa County Stream Maintenance Manual, which establishes consistent standards and best practices for maintaining channels while protecting sensitive environmental resources. Overall, the watershed management program integrates flood risk reduction, environmental stewardship, and interagency collaboration to protect life, property, and natural resources throughout Napa County.



Figure 8-4: Napa Creek

8.5 Risk Assessment

This section focuses on profiling hazards specific to NCFCWCD and assessing their vulnerability independent of the broader county-wide planning area, which has been evaluated in Section 3 of Volume 1. The hazard profiles in Volume 1 discuss overall impacts to the planning area and describe relevant plans, policies, and regulations; past events; location; frequency and probability of future occurrences; severity and extent; warning time; secondary hazards; and climate change impacts. For more information on risk assessment methodologies, see Volume 1, Appendix A.

This section includes a tailored vulnerability assessment, analyzing assets at risk such as population, property, and critical facilities and infrastructure unique to the district, and information on district-specific differences in hazard vulnerability across the planning area. It also identifies total district assets at risk, including people, property, and critical facilities and infrastructure within the district. In addition, this section presents growth and development trends for the community, offering insights into vulnerabilities and risks that represent the broader context of assets at risk.

8.5.1 Hazard Screening & Prioritization

Members of the Planning Team from each participating jurisdiction came together to collaboratively decide which county-wide hazards would be included in the MJHMP, and which would be excluded. Hazard screening and prioritization took place early in the process and integrated historic data, local knowledge, and consensus opinions to create a risk assessment matrix for the county as well as for each participating jurisdiction. These matrices indicate the priority of hazards prior to further refinement. Details about this process, the results of the discussion, and in-depth profiles for county-wide hazards can be found in Volume 1, Sections 2 and 3.

NCFCWCD's internal planning group used the same hazard identification and prioritization process as the county-wide Planning Team. They reviewed previously prepared hazard mitigation plans and other relevant documents to determine the realm of natural hazards that have the potential to affect the district. Table 8-9 provides a crosswalk of hazards identified in select planning documents, including the 2020 Napa County MJHMP, 2022 Groundwater Sustainability Plan, Climate Adaptation and Interconnected Surface Water and Groundwater Stewardship, and the 2023 State of California HMP. The crosswalk was used to develop a preliminary hazards list, providing a framework for the group to evaluate which hazards were truly relevant to NCFCWCD and which ones were not.

The internal planning group then ranked hazards based on their probability of affecting NCFCWCD and potential impacts on the community. Figure 8-5 displays the results of the hazard risk ranking exercise that was performed before further refinement. All hazards have been profiled in Volume 1 of this document. The purpose of this annex is to specifically address the district's vulnerability to specifically identified hazards.

Table 8-9: NCFCWCD Document Review of Potential Hazards

Hazard	2020 Napa County MJHMP	2020 GSP	2023 California SHMP
Agricultural Pests	■		■
Avalanche			■
Climate Change	■		■
Coastal			■
Dam Failure	■		■
Drought	■	■	■
Earthquake / Liquefaction	■		■
Extreme Cold			■
Extreme Heat			■
Extreme Weather / Storms	■	■	■
Flood	■	■	■
Geologic / Mass Movement	■		■
Human-Caused			■
Insects			■
Levee Failure			■
Pandemic Disease	■		■
Sea Level Rise			■
Soil			■
Subsidence			■
Tornado			■
Tsunami / Seiche Wave			■
Volcano			■
Wildfire	■	■	■

Risk Assessment Matrix Definitions

PROBABILITY RATING

The likelihood of a hazard event occurring within a time period?

PROBABILITY

- **Highly Likely** - 100% annual probability. Or Likely to occur every year in your lifetime.
- **Likely** - between 10 & 100% annual probability. Or will occur several times in your lifetime.
- **Possible** - between 1 & 10% annual probability. Or Likely to occur some time in your lifetime.
- **Unlikely** - less than 1% annual probability. Or unlikely but possible to occur in your lifetime.

IMPACT RATING

In terms of injuries, damage, or death, would you anticipate impacts to be minor, limited, critical, or catastrophic when a significant hazard event occurs? The impact could be in terms of one hazard event (flooding from a culvert failure) or a large-scale event (multiple rivers flooding) in the same jurisdictional boundary.

IMPACT

Minor	Limited	Critical	Catastrophic

Minor - very few injuries, if any. Only minor property damage & minimal disruption on quality of life. Temporary shutdown of critical facilities.

Limited - minor injuries only. Approx. 10% or less of property in disaster footprint damaged or destroyed. Complete shutdown of critical facilities for more than one day.

Critical - multiple deaths/injuries possible. Between 25% and 50% of property in disaster footprint is damaged or destroyed. Complete shutdown of critical facilities for more than one week.

Catastrophic - high number of deaths/injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for 30 days or more.

To concentrate resources, the jurisdictional planning team will focus on "High" and "Extreme" risk hazards, and "Medium" risk hazards to a lesser extent. These hazards have the higher probability and greater impact as it relates to the jurisdictions planning area.

Hazard definitions are included in **Vol. 1** of this plan. Some hazards are discussed as subset hazards— e.g., "Levee Failure" within the "Flood" hazard profile. If a hazard is not present on the risk matrix, is grey, or categorized as a "Low" risk hazard, the jurisdictional planning team felt the hazard had a minimal footprint or impact within their planning area and chose not to profile the hazard.

Hazard Information / Legend:



Climate Change impacts will be addressed within each relevant hazard section within the plan update and as a stand alone section for each jurisdiction. Climate change may change the frequency, duration, or intensity of other hazards profiled.

Napa County Flood Control and Water District Risk Matrix

IMPACT

PROBABILITY	Minor	Limited	Critical	Catastrophic
Highly Likely	SEVERE WEATHER	High	Extreme	Extreme
Likely	Medium	High	FLOOD	Extreme
Possible	Low	Medium	High	High
Unlikely	Low	Low	Medium	Medium

Figure 8-5: NCFCWCD Risk Assessment Matrix

Note: Hazard naming in the Risk Assessment Matrix may not match the final naming used. Refer to hazards prioritization summary table.

Priority Hazards

The results of the initial risk ranking exercise completed by the district's Planning Team, before further refinement, are identified in the county's completed matrix in Figure 8-5. Table 8-10 provides the final list of priority hazards and subhazards with additional details about why certain hazards were chosen and why others were not prioritized. However, it should be noted that many hazards not prioritized for profiling are briefly discussed as secondary or compounding hazards, and subhazards that were profiled and included in the risk assessment are listed specifically.

Table 8-10: NCFCWCD Hazards Prioritization Summary

Hazard	Priority	Explanation
Earthquake / Liquefaction	-	Profiled in Volume 1, Section 3.3.4; not a priority due to being outside jurisdictional mission and authority
Wildfire	-	Profiled in Volume 1, Section 3.3.1; not a priority due to low probability and impact potential
Flood	**High**	**Profiled in Volume 1, Section 3.3.2, and Section 8.5.2.1 in this annex**
Levee Failure	-	Profiled in Volume 1, Section 3.3.2; not a priority due to low probability and impact potential
Extreme Weather / Storms	**Medium**	**Profiled in Volume 1, Section 3.3.5, and Section 8.5.2.2 in this annex as Severe Weather, including High Wind and Heavy Rain** (Winter Weather not a priority due to low probability and impact potential)
Drought	-	Profiled in Volume 1, Section 3.3.6; not a priority due to being outside jurisdictional mission and authority
Geologic / Mass Movement	-	Profiled in Volume 1, Section 3.3.5; not a priority due to low probability and impact potential
Extreme Heat	-	Profiled in Volume 1, Section 3.3.8; not a priority due to being outside jurisdictional mission and authority
Agricultural Pests	-	Profiled in Volume 1, Section 3.3.9; not a priority due to being outside jurisdictional mission and authority
Sea Level Rise	**High**	**Profiled in Volume 1, Section 3.3.9, and Section 8.5.2.3 under Climate Change**
Climate Change	**High**	**Profiled in Volume 1, Section 3.3.9, and Section 8.5.2.3 in this annex, including Sea Level Rise** and discussed as a compounding hazard in relevant profiles
Dam Failure	-	Profiled in Volume 1, Section 3.3.3; not a priority due to being outside jurisdictional mission and authority

8.5.2 Vulnerability to Specific Hazards

Assessing vulnerabilities exposes the unique characteristics of individual hazards and begins the process of narrowing down which areas within the district are vulnerable to specific hazard events. The vulnerability assessment considered unique local knowledge of hazards and impacts and a GIS overlaying method for examining such vulnerabilities in more depth. Using these methods, the district's planning group estimated vulnerable populations, properties, and assets, and potential losses. In addition, the exposure of district assets to drought, earthquake, wildfire, flood, and climate change hazards were also considered.

Many of the hazard profiles include a snapshot map and damage estimation tables that illustrate the district's vulnerabilities to those specific hazards. These maps assisted the planning group in understanding the hazard exposure of populations, parcels, and critical facilities and infrastructure. Each snapshot map contains an exposure summary that displays the percentage of the population, the improvement and content value of parcels, and the amount of critical infrastructure that is exposed. For hazards without geospatial extents, such as drought and severe weather, narratives are provided instead of exposure maps and tables.

Based on the hazard prioritization exercise, this vulnerability assessment focuses on three hazards for NCFCWCD, some of which encompass sub hazards such as sea level rise and heavy rain.

Flood
SECTION 8.5.2.1



Severe Weather
SECTION 8.5.2.2



Climate Change
SECTION 8.5.2.3



8.5.2.1 Flood Hazard

Flood hazards within the NCFCWCD occur primarily along the Napa River and its tributaries, which drain the Napa Valley watershed before discharging into San Pablo Bay. The Napa River watershed covers approximately 426 square miles, extending from the Mayacamas Mountains on the west and the Vaca Range on the east through the valley floor where the majority of development occurs. Flood hazards are most pronounced along the lower gradient portions of the watershed where river channels widen and flow velocities decrease. Areas particularly susceptible to flooding include the Napa River corridor, tributary streams, low-lying urban areas within the City of Napa, and agricultural lands throughout the valley floor.

Flooding within the watershed is typically riverine in nature, occurring when prolonged or intense rainfall causes the Napa River or its tributaries to exceed channel capacity. In downstream portions of the watershed, particularly near the southern end of the county, tidal influences from San Pablo Bay can exacerbate flooding by slowing drainage from the river system. Localized flooding can also occur within developed areas where stormwater drainage systems become overwhelmed during heavy rainfall events. Flood severity in Napa County can range from nuisance flooding in localized drainage areas to large-scale riverine flooding that impacts homes, businesses, agricultural lands, and critical infrastructure.

Napa County has experienced numerous flood events throughout its history due to winter storms and atmospheric river events that produce large volumes of rainfall over short periods. Significant flood events have occurred in 1986, 1995, 1997, and 2005, each of which caused substantial property damage and disruption within the Napa Valley. The 1986 flood is widely considered one of the most severe events in the county's history, resulting in widespread inundation throughout the City of Napa and surrounding communities. Subsequent floods in the 1990s and early 2000s again demonstrated the vulnerability of developed areas located along the Napa River floodplain.

Flood events have historically affected residential neighborhoods, commercial districts, agricultural operations, and transportation infrastructure throughout the watershed. These repeated events prompted the development of major flood management initiatives and ongoing watershed management activities by the Napa County Flood Control and Water Conservation District to reduce flood risk and improve system resilience.

Flooding in Napa County is considered a high probability hazard due to the region's climate, watershed characteristics, and history of recurring flood events. The county experiences the majority of its annual precipitation during the winter storm season between November and April, when atmospheric river systems can deliver prolonged periods of heavy rainfall. These storms can rapidly increase river flows and produce flooding along the Napa River and its tributaries.

Future flood events are expected to occur periodically, particularly during extreme storm events or when saturated watershed conditions result in high runoff volumes. Given the region's long history of flooding and the continued presence of development within flood-prone areas, flooding remains one of the most likely hazards affecting communities within the District.

Climate change is expected to influence future flood risk in Napa County through changes in precipitation patterns and hydrologic conditions. Climate projections for California indicate an increased likelihood of more intense storm events and atmospheric rivers, which could produce higher peak runoff and increased flood potential. Warmer temperatures may also alter watershed processes, including soil moisture conditions and the timing of precipitation.

In addition, sea level rise may affect downstream portions of the Napa River system by increasing tidal influence and reducing the river's ability to drain stormwater during high tide conditions. These factors may increase flood depths and the frequency of flooding in low-lying areas near the southern end of the watershed. As a result, long-term flood management planning must account for potential climate-driven changes in flood behavior.

Flood hazards within NCFCWCD have the potential to impact residential neighborhoods, commercial areas, agricultural lands, and critical infrastructure located along the Napa River and its tributaries. The City of Napa and surrounding developed areas within the valley floor represent the most concentrated exposure due to its proximity to the river and historic floodplain areas as shown in Figure 8-6.

In addition to structural damage, flood events can disrupt transportation routes, utilities, and public services, affecting emergency response and recovery operations. Agricultural lands throughout the Napa Valley are also vulnerable to flood impacts that may damage crops, disrupt irrigation infrastructure, and affect local economic activity. Vulnerable populations, including elderly residents and lower-income households located in flood-prone areas, may face additional challenges during flood events due to limited resources for evacuation or recovery.

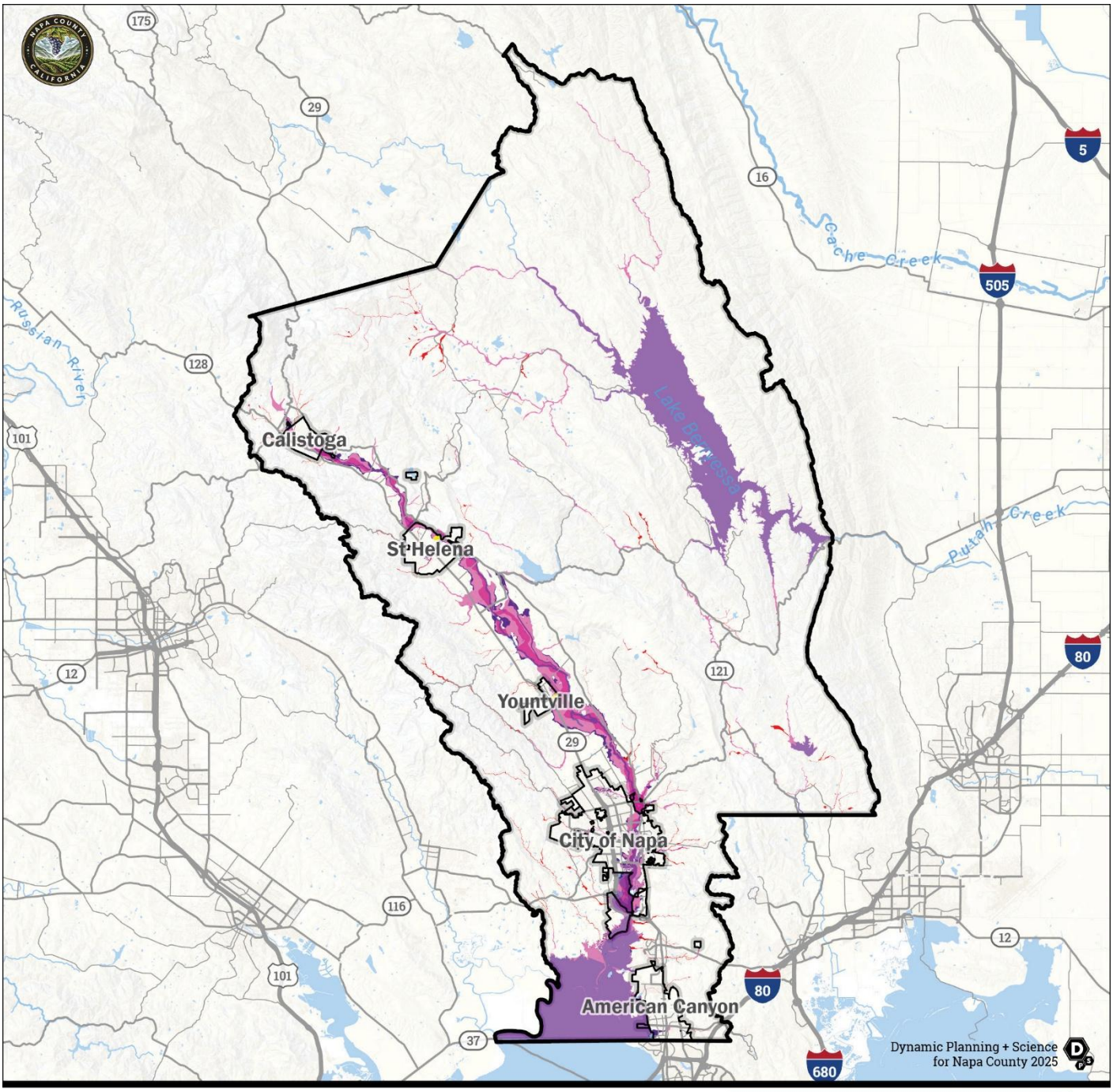


Figure 8-6: NCFCWCD Flood Risk (FEMA and DWR Awareness Zones)

8.5.2.2 Severe Weather Hazard

Severe weather in Napa County includes a range of meteorological conditions that can cause damage to infrastructure, disrupt services, and exacerbate other natural hazards. The most common severe weather hazards affecting the NCFCWCD include heavy rainfall and high wind events, but winter storms, thunderstorms, and hail also occur occasionally. These events typically occur during the winter months but can also occur during transitional seasons when strong atmospheric systems move through Northern California.

Heavy precipitation events are the most consequential severe weather hazard for the district because they directly influence watershed runoff and river levels within the Napa River watershed. Atmospheric river storms can deliver large volumes of rainfall over short periods, which may overwhelm stormwater systems, increase streamflow, and contribute to riverine flooding. Severe weather events can also generate strong winds capable of damaging trees, power lines, and infrastructure, which can create additional hazards such as power outages or debris accumulation in waterways and drainage systems.

Severe weather can affect the entire service area of NCFCWCD, which encompasses all of Napa County. However, impacts can vary depending on local topography and land use patterns. Mountainous areas along the Mayacamas Mountains and Vaca Range often experience higher wind speeds and heavier rainfall due to orographic effects, while the Napa Valley floor may experience localized flooding or stormwater drainage issues during intense precipitation events.

Urbanized areas, particularly within the City of Napa, may be vulnerable to stormwater-related impacts such as street flooding, drainage system overload, and debris accumulation in storm drains. Agricultural lands throughout the valley may also be affected by severe weather events through crop damage, soil erosion, or flooding of low-lying fields.

Severe weather events occur regularly in Napa County, particularly during the winter months when Pacific storm systems move through Northern California. Atmospheric river storms have historically produced periods of intense rainfall, strong winds, and localized flooding throughout the region. Severe storms in the past have caused power outages, roadway flooding, fallen trees, and debris blockages in waterways and storm drainage systems.

Although severe weather events alone may not always cause widespread damage, they frequently contribute to or intensify other hazards, particularly flooding and slope instability. For example, heavy rainfall associated with winter storms has historically preceded major flood events within the Napa River watershed.

The probability of severe weather occurring in Napa County is high, as storm events occur annually during the winter wet season. Multiple storm systems typically affect the region each year, with occasional larger events producing higher wind speeds and more intense rainfall. While many storms result in limited impacts, stronger atmospheric river events can significantly increase hazard potential by producing prolonged rainfall and elevated runoff within the watershed.

Climate projections for California suggest that storm intensity may increase in the future, even as the total number of storm events remains similar. Research indicates that atmospheric river storms may become more intense, producing heavier rainfall over shorter durations. These conditions could increase the likelihood of flooding, erosion, and stormwater management challenges within the Napa River watershed.

Additionally, warmer temperatures may influence storm patterns and watershed conditions, potentially leading to more extreme precipitation events. As a result, severe weather hazards may interact more strongly with flood hazards, requiring continued monitoring, watershed management, and infrastructure maintenance to maintain resilience.

Severe weather hazards can affect residents, infrastructure, and natural resources throughout Napa County. Vulnerable assets include transportation corridors, utilities, stormwater infrastructure, agricultural lands, and residential neighborhoods located in low-lying areas. Strong winds may damage trees and structures, while heavy rainfall can cause localized flooding, erosion, and debris accumulation in waterways.

Severe weather also poses secondary risks by increasing pressure on flood control infrastructure and drainage systems managed by NCFCWCD. Effective watershed maintenance, stormwater management, and emergency coordination are therefore essential to reducing impacts associated with severe weather events.

Heavy Rainfall & Storm Events

Heavy rainfall is one of the most significant severe weather hazards affecting NCFCWCD. Napa County experiences a Mediterranean climate characterized by wet winters and dry summers, with most precipitation occurring between November and April. During this period, Pacific storm systems and atmospheric rivers can deliver large volumes of rainfall over short periods. These storms can generate intense runoff within the Napa River watershed, increasing stream flows and placing pressure on drainage systems, channels, and flood control infrastructure.

Heavy rainfall events can lead to several secondary hazards including riverine flooding, localized urban flooding, erosion, and slope instability. Low-lying areas along the Napa Valley floor, particularly within developed portions of the City of Napa, are especially vulnerable when stormwater systems are overwhelmed or when runoff exceeds channel capacity. Agricultural lands throughout the valley may also experience inundation during extended storm events. Because heavy rainfall is the primary driver of flooding in the region, it represents one of the most important weather-related hazards affecting the District's watershed management responsibilities.

Thunderstorms occur less frequently in Napa County than in other parts of the United States but can still develop during periods of atmospheric instability, particularly during late spring, summer, and early fall. These storms may produce short-duration intense rainfall, lightning, gusty winds, and occasionally small hail. Although thunderstorms are typically localized and short-lived, they can generate intense rainfall that produces rapid runoff and localized flooding.

Localized thunderstorms can overwhelm storm drains, culverts, and small channels if rainfall intensity exceeds drainage capacity. Lightning associated with thunderstorms also presents a hazard to infrastructure, vegetation, and outdoor activities. In rural or agricultural areas, thunderstorms may contribute to soil erosion or localized crop damage. While thunderstorms do not generally produce widespread flooding in Napa County, their potential to generate sudden heavy rainfall and wind gusts means they remain a relevant severe weather hazard within the region.

Strong Winds

High wind events occasionally occur in Napa County during winter storms or during periods of strong pressure gradients associated with passing weather systems. Wind speeds may increase as storms move through the region, particularly in elevated areas along the Mayacamas Mountains and Vaca Range, where topography can amplify wind intensity. While winds in Napa County are typically moderate compared with coastal regions, strong gusts during storm events can still cause damage to trees, structures, and utility infrastructure.

High winds can create secondary hazards by downing trees, damaging power lines, and depositing debris into waterways and storm drainage systems. Fallen vegetation and debris can obstruct channels and culverts, reducing flow capacity and increasing the potential for localized flooding during heavy rainfall events. Wind-related impacts may also cause temporary power outages or transportation disruptions. Although high winds alone may not produce widespread structural damage in Napa County, they can significantly contribute to the cascading impacts associated with winter storm events.

8.5.2.3 Climate Change Hazard

Average annual temperatures across most of California have already increased by more than 1°F, with some areas experiencing rises of over 2°F when comparing the 1901–1960 average to that of 1986–2016. Daily maximum temperatures, a key indicator of extreme heat, are projected to increase by 4.4°F to 5.8°F by 2050 and by 5.6°F to 8.8°F by 2100. Heat waves that impact public health, known as heat-health events, are also expected to intensify across the state. By 2050, these events are projected to last up to two weeks longer in the Central Valley and occur four to ten times more often in the Northern Sierra region (California Natural Resources Agency, 2022).

California is already experiencing significant impacts from climate change, including prolonged drought, a lengthened wildfire season, increased coastal flooding and erosion, and widespread tree mortality. The state has observed rising average temperatures, more extreme heat days, fewer cold nights, a longer growing season, and shifts in the water cycle, with less winter precipitation falling as snow. In addition, summertime fog has declined by approximately 33%, and both snowmelt and rainwater runoff are occurring earlier in the year (Cal OES, 2018).

Long-term trends indicate a 12% to 20% decline in fog across California from 1900 through projections to 2070. Climate experts suggest that warming temperatures reduce the ability of air masses to cool enough to

produce fog, which plays a critical role in supporting California's ecosystems (Grantham, Teodore; University of California, Berkeley, 2018).

Climate change is expected to influence the frequency, intensity, and impacts of several natural hazards affecting Napa County and NCFCWCD. Changes in temperature, precipitation patterns, and sea level are projected to alter watershed processes and increase the likelihood of certain hazard events. Because the district is responsible for flood control, watershed management, and water resource planning within the Napa River watershed, climate-related changes have important implications for long-term hazard mitigation and infrastructure planning.

One of the most significant projected climate impacts for Northern California is the potential for more intense precipitation events associated with atmospheric rivers. While total annual rainfall may not increase substantially, future storms are expected to deliver larger volumes of rain over shorter time periods. These conditions can increase peak runoff within the Napa River watershed, placing greater stress on river channels, stormwater systems, and flood control infrastructure. Higher runoff rates may increase the likelihood of flooding, erosion, and sediment transport within the Napa River and its tributaries. More intense storm events could also exacerbate urban drainage issues and increase localized flooding in developed areas.

Climate change is also expected to contribute to warmer temperatures and longer dry periods, which can influence watershed conditions and water resource availability. Prolonged dry periods may reduce soil moisture and vegetation cover, potentially increasing erosion when storms eventually occur. These shifts may affect stream stability, sediment loads, and overall watershed function. Changes in seasonal precipitation patterns may also alter the timing of runoff and water availability within the watershed.

In addition, sea level rise in San Pablo Bay has the potential to influence downstream portions of the Napa River system. Rising water levels in the Bay can increase tidal influence within the lower Napa River, which may reduce the river's ability to drain stormwater during high tides. This backwater effect can contribute to higher flood elevations in low-lying areas during storm events. As sea levels continue to rise over time, tidal flooding and storm surge may increase flood risk in downstream portions of the watershed.

Sea Level Rise

Sea level rise is an emerging hazard that may affect portions of the Napa River watershed within NCFCWCD. The lower Napa River flows into San Pablo Bay, which is part of the larger San Francisco Bay Estuary. As global sea levels rise due to climate change, water levels within San Pablo Bay are expected to increase over time. Higher tidal water levels can influence the downstream portions of the Napa River by reducing the river's ability to discharge stormwater during high tide conditions. This phenomenon, often referred to as tidal backwater effects, can increase water surface elevations in the lower river and contribute to higher flood levels during storm events.

Sea level rise may also increase the likelihood and extent of tidal flooding in low-lying areas near the southern portion of Napa County (Figure 8-7), particularly during high tides combined with storm surge or

heavy rainfall events. When elevated tides coincide with significant precipitation and increased river flows, water levels in the Napa River can rise more quickly and remain elevated for longer periods. This interaction between coastal and watershed processes can increase the potential for flooding in downstream areas of the river corridor.

Over time, rising sea levels may also influence sediment transport, channel dynamics, and wetland conditions within the Napa River estuary. Changes in tidal patterns and sediment deposition may affect channel conveyance and the function of natural floodplain areas. Wetlands and tidal marshes within the estuary play an important role in attenuating wave energy, storing floodwaters, and supporting habitat. Protecting and restoring these natural systems can help reduce the impacts of sea level rise while maintaining ecological benefits.

Although the majority of the Napa Valley lies inland and at elevations above tidal influence, the potential effects of sea level rise in downstream portions of the watershed highlight the importance of long-term planning and adaptive management. Continued monitoring of tidal conditions, coordination with regional climate adaptation initiatives, and integration of sea level rise projections into infrastructure planning can help ensure that flood protection and watershed management systems remain resilient as climate conditions evolve.

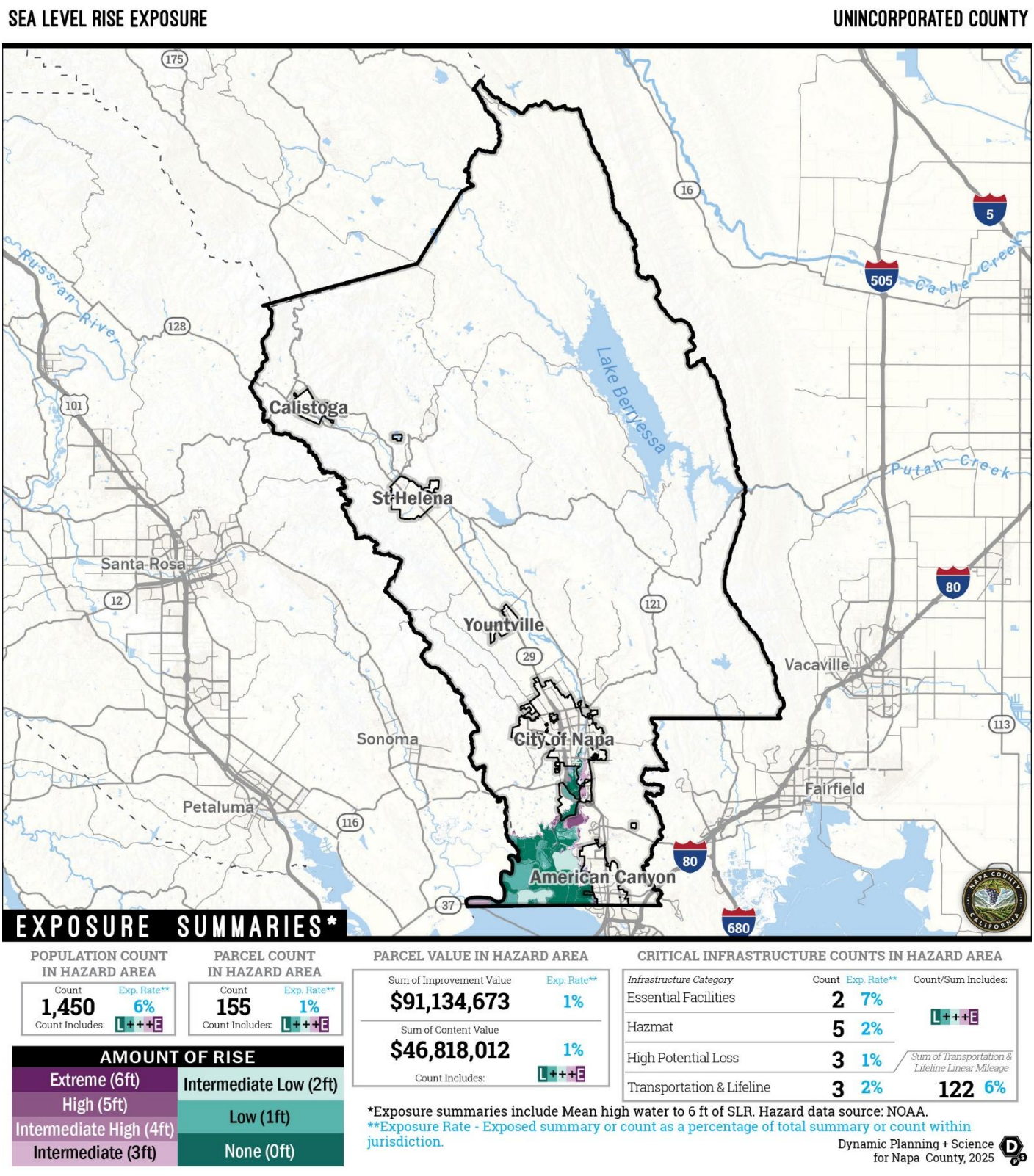


Figure 8-7: Exposure Summary – NCFCWCD Sea Level Rise Risk

8.5.3 Climate Change Impacts & Vulnerable Populations

Climate change is expected to influence several natural hazards affecting Napa County and NCFCWCD, including flooding, severe weather, drought, and extreme temperatures. Changes in precipitation patterns, increasing temperatures, and rising sea levels may alter watershed conditions and increase the severity or frequency of certain hazards. These changes can place additional stress on flood control infrastructure, stormwater systems, and water resources while also affecting communities that are more vulnerable to environmental and economic disruptions.

One of the primary climate-related concerns for Napa County is the potential for more intense precipitation events, particularly during atmospheric river storms. These storms can produce large amounts of rainfall over short periods, increasing runoff within the Napa River watershed and elevating flood risk along the Napa River and its tributaries. At the same time, longer and more frequent dry periods are projected to occur between storm events, which may contribute to drought conditions, reduced soil moisture, and increased wildfire risk in surrounding upland areas. Rising temperatures can also increase the frequency of extreme heat events, affecting public health and increasing demand on water and energy systems.

Climate change may also influence downstream flooding through sea level rise in San Pablo Bay, which can increase tidal influence in the lower Napa River system. Higher water levels in the Bay may reduce the river's ability to discharge stormwater during high tide conditions, potentially increasing flood elevations in low-lying areas. These combined climate impacts highlight the importance of continued watershed management, infrastructure maintenance, and long-term planning to ensure that flood protection and water resource systems remain resilient.

Certain populations within Napa County may be more vulnerable to the impacts of climate-related hazards. These include older adults, individuals with disabilities, low-income households, and residents living in flood-prone or environmentally sensitive areas. Older adults living alone may face additional challenges during emergencies such as evacuations or extended power outages. Households with limited financial resources may also have fewer options for recovering from hazard-related damages or implementing protective measures. In addition, residents who rely on public transportation or lack access to a personal vehicle may face barriers when responding to emergency situations.

Communities with limited English proficiency may also encounter challenges accessing hazard information, emergency alerts, or recovery assistance if communication materials are not available in accessible languages. Because Napa County includes a diverse population with varying socioeconomic conditions, it is important that hazard mitigation and climate adaptation strategies consider the needs of vulnerable populations. Ensuring equitable access to hazard information, preparedness resources, and recovery assistance can help reduce the disproportionate impacts of climate-related hazards and support community resilience throughout the watershed.

8.5.4 Hazard Problem Statements

As part of the mitigation action identification process, the Planning Committee for each jurisdiction identified areas of concern (aka problem statements) for their respective facilities based on the risk assessment and vulnerability analysis, utilizing the RAMP mapping and static snapshot maps. Problem statements focused on the impact, victim, or threat that the hazard could create in the jurisdiction, as described in Table 8-11. Identifying common issues and weaknesses through these problem statements assisted the planning group in understanding the realm of resources needed for mitigation.

The goal is to have at least one mitigation action for every problem statement. Projects or actions have been developed to mitigate each problem identified. See Table 8-13 for a full list of mitigation actions and corresponding problem statements that they address. Each problem statement is coded with a problem number for cross-referencing between Table 8-11 and Table 8-13

Table 8-11: NCFCWCD Hazard Problem Statements

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-CC-NCFC-370	Climate Change	Impact	**Napa County Flood Control and Water Conservation District**	Sea level rise and climate-driven precipitation variability, exacerbated by king tides, has changed local hydrologic conditions and water elevations along the lower Napa River and southern County areas, threatening infrastructure and agricultural lands.	ma-CC-NCFC-244, ma-CC-NCFC-245, ma-FL-NCFC-65
ps-CC-NCFC-371	Climate Change	Impact	**Napa County Flood Control and Water Conservation District**	Climate change is increasing the frequency and severity of severe weather and flood, as well as droughts and extreme heat events, straining water resources, reducing recharge, and challenging the District's water supply coordination, flood control, restoration projects, and water management operations.	ma-CC-NCFC-244, ma-CC-NCFC-245, ma-FL-NCFC-64, ma-FL-NCFC-65, ma-FL-NCFC-66, ma-SW-NCFC-243, ma-FL-NCFC-67
ps-FL-NCFC-104	Flood	Victim	**Napa County Flood Control and Water Conservation District**	Flood-prone residential structures in select areas along the Napa River and its tributaries remain unprotected by the incomplete Measure "A" Flood Project, leading to continued NFIP repetitive losses.	ma-FL-NCo-53, ma-FL-NCFC-64, ma-FL-NCFC-65, ma-CC-NCFC-245, ma-FL-NCFC-67, ma-SW-NCFC-243
ps-FL-NCFC-105	Flood	Threat	**Napa County Flood Control and Water Conservation District**	Annual restoration and sediment management along the Napa River and tributaries are needed to sustain floodplain function, water quality, and channel conveyance.	ma-FL-NCFC-67, ma-FL-NCFC-66, ma-FL-NCFC-67, ma-SW-NCFC-243
ps-FL-NCFC-106	Flood	Threat	**Napa County Flood Control and Water Conservation District**	Creeks, River, and channels require routine inspection and maintenance to prevent sediment buildup, vegetation overgrowth, and erosion that reduce channel capacity and cause recurring local flooding.	ma-FL-NCFC-66, ma-FL-NCFC-67

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-FL-NCFC-107	Flood	Threat	**Napa County Flood Control and Water Conservation District**	Invasive vegetation and exotic weeds reduce stream capacity and increase localized flood risk. Continuous management and monitoring are required within the Stream Maintenance Program.	ma-FL-NCFC-66, ma-FL-NCFC-67
ps-SW-NCFC-142	Severe Weather	Impact	**Napa County Flood Control and Water Conservation District**	Severe weather events, including heavy rain and high winds, can cause downed trees, debris accumulation, and higher volume discharges than system design, impacting channel conveyance in the creeks and the Napa River.	ma-SW-NCo-81, ma-SW-NCo-82, ma-AH-NCo-5, ma-SW-NCFC-123, ma-CC-NCFC-245, ma-FL-NCFC-64, ma-FL-NCFC-66, ma-SW-NCFC-243

8.6 Mitigation Strategy

This section provides the framework for how NCFCWCD will reduce hazard risk within its jurisdiction while supporting the broader goals of the Napa County MJHMP. It includes an overview of existing capabilities, opportunities to strengthen resilience, and the district's prioritized mitigation actions. Together, these elements demonstrate how NCFCWCD integrates hazard awareness into its planning and development processes while contributing to a coordinated countywide approach.

Within the Napa County MJHMP, the mitigation strategy serves as the roadmap for future hazard mitigation efforts. For NCFCWCD, the strategy outlined in this annex reflects the outcomes of the countywide planning process while also addressing the district's unique risks, priorities, and community needs. The strategy is designed to reduce vulnerabilities identified in the risk assessment, including the problem statements developed for wildfire, earthquakes and severe weather, and climate change.

Mitigation actions identified in this annex include both policy-based and project-based initiatives, with an emphasis on integrating resilience into land use planning, infrastructure investments, and community programs. Actions are structured to align with FEMA's requirements and to coordinate with existing district, county, and regional planning mechanisms. Each action identifies responsible parties, potential funding sources, and the resources needed for implementation.

For NCFCWCD, this strategy provides a framework for strengthening resilience by combining district-led initiatives, such as infrastructure improvements, and community preparedness, with regional coordination through the MJHMP. By advancing these efforts in alignment with the GSP and other local planning documents, NCFCWCD enhances its ability to reduce hazard risk while supporting long-term community safety, sustainability, and economic stability.

The subsections that follow describe these elements in detail:

- **Sections 8.6.1, Capabilities and Opportunities,** provides a summary of the district's capacity to address natural hazards.
- **Section 8.6.2, Mitigation Action Plan,** presents the district's prioritized actions to guide implementation in coordination with countywide strategies.
- **Section 8.6.3, Status of Previous Mitigation Actions,** provides a summary of all previous actions and their current status, whether completed, cancelled, or revised.

Aligning the Action Plan

This section connects NCFCWCD's mitigation actions with its existing capabilities and areas for growth. Capability assessments are a required element of hazard mitigation planning under the Disaster Mitigation Act of 2000 and FEMA's 2023 guidance, ensuring that actions are realistic, achievable, and aligned with available resources.

The section begins with a summary of NCFCWCD's capabilities across four areas: planning and regulatory, administrative and technical, fiscal, and education and outreach. This overview highlights the tools and strengths that the district already uses to reduce hazard risk. The section then provides a detailed analysis of each capability area, identifying both current practices and opportunities to expand resilience.

8.6.1 Capabilities & Opportunities

This section provides a detailed assessment of the district's current capabilities to support hazard mitigation, as well as future opportunities. This consists of describing how the NCFCWCD is planning for hazards and growth and a summary of its existing capabilities and the potential for enhancement.

8.6.1.1 Planning for Hazards & Growth

NCFCWCD plays an important role in coordinating watershed management, flood protection planning, and water resource stewardship across Napa County as development and population growth continue within the region. While the District itself does not control land use decisions, it works closely with Napa County and the incorporated cities of Napa, American Canyon, Calistoga, St. Helena, and Yountville to ensure that flood hazards, stormwater management, and watershed protection are considered during planning and development activities. Through this coordination, the district helps integrate hazard mitigation into broader planning efforts that guide future development patterns within the Napa River watershed.

Local land use policies within Napa County emphasize managed growth and protection of agricultural lands, which has resulted in relatively concentrated development within established urban areas along the Napa Valley floor. This approach helps limit expansion into environmentally sensitive areas and flood-prone lands while directing development toward locations where infrastructure and services already exist. Nevertheless, continued population growth, housing demand, and redevelopment within cities can increase exposure to hazards if development occurs near waterways, drainage corridors, or low-lying areas. The

district therefore provides technical expertise and coordination related to floodplain management, watershed conditions, and drainage infrastructure to help reduce hazard exposure as communities grow.

Planning for hazards and growth also involves maintaining and improving watershed infrastructure that supports flood protection and stormwater management. The district's ongoing stream maintenance activities, sediment management efforts, and coordination with regional stormwater programs help ensure that river channels and drainage systems continue to function effectively as land use patterns evolve. These activities help maintain conveyance capacity and reduce the risk that increased runoff from urban development will contribute to flooding or erosion.

In addition to infrastructure management, the district participates in regional planning initiatives and collaborates with state and federal partners to pursue funding opportunities for watershed improvements and flood mitigation projects. By coordinating with local governments and resource agencies, the district helps ensure that hazard mitigation considerations are incorporated into long-term planning decisions affecting watershed health, water resources, and flood protection throughout Napa County. This collaborative planning approach supports the district's mission of protecting life, property, and natural resources while accommodating responsible growth within the watershed.

8.6.1.2 Development & Hazard Considerations

Development NCFCWCD is closely tied to the natural characteristics of the Napa River watershed and the broader planning policies that guide growth throughout Napa County. While most land use authority rests with Napa County and the incorporated cities within the watershed, hazard considerations, particularly those related to flooding, stormwater management, and watershed protection, are an important factor in evaluating new development and redevelopment projects. The district provides technical coordination and watershed expertise to help ensure that development activities account for flood risk, drainage capacity, and watershed conditions.

A significant portion of development in Napa County occurs along the Napa Valley floor, where relatively flat terrain and existing infrastructure support residential, commercial, and agricultural uses. However, many of these areas are located near the Napa River and its tributaries, which can expose development to flood hazards during major storm events. As a result, development proposals within or near flood-prone areas must consider floodplain conditions, stormwater runoff, and potential impacts to existing drainage systems. Integrating flood risk considerations into development planning helps reduce future vulnerability to flooding and supports long-term watershed resilience.

Urban development can also increase impervious surface coverage, such as roads, parking areas, and rooftops, which can accelerate stormwater runoff and increase peak flows in local waterways. Without appropriate stormwater management measures, these changes can contribute to localized flooding, erosion, and sediment transport within the watershed. To address these risks, development projects often incorporate drainage improvements, stormwater controls, and other measures designed to manage runoff and protect downstream waterways. Coordination with regional stormwater programs and adherence to

regulatory requirements help ensure that new development minimizes adverse impacts on watershed systems.

In addition to flood hazards, development within Napa County must consider other natural hazards such as severe weather, erosion, and potential slope instability in areas with steeper terrain. Planning for these hazards helps protect public safety and infrastructure while preserving the natural functions of streams and riparian corridors. By incorporating hazard considerations into development planning and infrastructure design, communities within the district's service area can support sustainable growth while reducing long-term exposure to natural hazards.

8.6.1.3 Capabilities & Opportunities Assessment

To develop a realistic and actionable mitigation strategy, it must account for existing jurisdictional capabilities and what future opportunities there are to enhance those capabilities for purposes of hazard mitigation. This section provides an assessment of the district's existing capabilities and future opportunities, including planning and regulatory, administrative and technical, fiscal, and public outreach and education capabilities. This assessment also identifies opportunities to integrate this MJHMP into future planning, policies, or programs to weave mitigation efforts into daily operations and address hazard problems wholistically. Capabilities are categorized into four groups and include various mechanisms.

- **Planning and Regulatory Capabilities:** Existing long-range plans, emergency response plans, hazard-specific plans, land use policies, and building and development standards.
- **Administrative and Technical Capabilities:** Available expertise in emergency services, engineering, grant management, and community planning.
- **Fiscal Capabilities:** Budgetary capacity, taxing authority, grants, and other funding mechanisms that can support mitigation projects.
- **Outreach and Education Capabilities:** Existing programs for providing technical assistance, community education, public warnings, and stakeholder engagement.

A full description of the process used to develop the capabilities assessment is provided in Volume 1, Section 2.3.3.

The capabilities and opportunities assessment for NCFCWCD lists the various types of capabilities along with how they have been, currently are, or will in the future be integrated into hazard mitigation planning efforts. The three "HMP Integration" columns that identify the capability's status and usage are color-coded with green, yellow, or orange shading to communicate the following:

- **Status:** If the capability is present at all and what level of use it has generally.
- **Current Mitigation Use:** If the capability is currently being used in mitigation efforts, specifically, and at what level.
- **Future Opportunity:** If there is a future opportunity to integrate the capability into mitigation efforts and at what level.

Summary of Capabilities & Opportunities

This Capabilities and Opportunities Assessment for the NCFCWCD summarizes the various types of capabilities it has for hazard mitigation currently. The assessment also identifies opportunities to integrate, expand, and improve the district's capabilities for future hazard mitigation. Table 8-12 provides a comprehensive list of capabilities and identifies the current status, current mitigation use, and future opportunities.

Planning & Regulatory

NCFCWCD has strong planning and regulatory capabilities related to flood risk reduction, watershed management, and stormwater coordination. The district's capital improvement and maintenance programs, including the Napa River/Napa Creek Flood Protection Project and Annual Stream Maintenance Program, provide key hazard mitigation benefits by improving flood conveyance, maintaining channels, managing vegetation and sediment, and supporting nature-based "living river" flood protection approaches.

The district also participates in regional planning efforts that support stormwater management, groundwater sustainability, drought resilience, and watershed health. These include the Countywide Stormwater Management Program, coordination with the Napa Valley Groundwater Sustainability Agency, and participation in the Napa Valley Drought Contingency Plan. These partnerships demonstrate strong interagency coordination and support integrated water resource management.

Some hazard planning areas, including wildfire planning, Firewise programs, fire prevention, seismic safety, and earthquake modernization, are led by other agencies rather than the district. However, opportunities exist to strengthen internal preparedness for District facilities, better align stream corridor vegetation management with wildfire mitigation goals, expand nature-based and green infrastructure projects, and improve public outreach through bilingual materials and additional flood and stormwater education tools.

Future integration of the MJHMP will occur through various processes and mechanisms outlined across multiple mitigation actions (Table 8-13). Key opportunities for future hazard mitigation integration with the NCFCWCD existing planning mechanisms include incorporating the updated risk assessment, flood hazard data, and projected climate change impacts into the Sea Level Rise & Climate Impact Flood Modeling (ma-CC-NCFC-244), Climate Change Resilience Plan & Outreach (ma-CC-NCFC-245), Enhance Countywide Storm Watch System (ma-FL-NCFC-64), and Improved Stream Channel Inspection & Maintenance (ma-FL-NCFC-66).

Administrative & Technical

NCFCWCD has administrative and technical resources that support hazard mitigation, flood infrastructure management, and coordination with partner agencies. Although the District is not a primary emergency response agency and does not maintain dedicated emergency management staff, it works closely with Napa County OES and other partners during flood events to provide technical information, monitor watershed conditions, and support response operations.

The district's strongest technical capabilities include engineering and GIS support. The District Engineer provides oversight for flood control infrastructure, watershed management, capital improvement projects, and evaluation of flood risk conditions. GIS capabilities are supported through Napa County PBES and help with watershed analysis, infrastructure mapping, emergency coordination, and data-driven hazard mitigation planning.

Public outreach is conducted mainly through the Countywide Stormwater Management Program and flood protection project communications, which provide education, updates, and watershed management information. Grant management and funding coordination are handled by administrative and analyst staff rather than a dedicated grant specialist. Expanding grant coordination capacity could strengthen the district's ability to pursue additional funding for flood protection, watershed restoration, and hazard mitigation projects.

Warning Systems & Services

NCFCWCD benefits from countywide warning and emergency communication systems administered primarily by Napa County OES. These systems support public notification for floods, wildfires, severe weather, geological hazards, and other emergencies, helping residents, businesses, and responders maintain situational awareness and make evacuation decisions.

Key notification tools include ALERT Napa County, which sends emergency messages by phone, text, and email; national alert systems such as IPAWS and Wireless Emergency Alerts; the Genasys Protect platform, which provides mapped evacuation zones and real-time status updates; and the Hi-Lo siren system, which signals urgent evacuation conditions in certain areas. During flood, wildfire, and other hazard events, these systems provide timely evacuation warnings, orders, and hazard updates.

Although existing warning systems provide strong multi-hazard coverage, opportunities remain to expand early warning capabilities, including potential integration with earthquake early warning tools such as ShakeAlert. Continued coordination between NCFCWCD, Napa County OES, and regional partners will help ensure timely and accurate emergency information for communities within the Napa River watershed.

Fiscal

NCFCWCD has several fiscal capabilities that support hazard mitigation, flood infrastructure maintenance, and watershed management. Historically, Measure A was a major funding source for large-scale flood protection projects, providing local sales tax revenue for projects such as flood risk reduction infrastructure. Although the sales tax has sunset, a maintenance fund remains to support ongoing operation and maintenance of flood protection facilities.

The district does not function as a retail water utility and does not rely on traditional utility fees, development impact fees, or system development charges as primary revenue sources. Instead, its fiscal role is focused on flood control, watershed management, stormwater coordination, and regional

partnerships. The district also administers State Water Project contracts involving pass-through costs and administrative fees.

NCFCWCD has used debt financing and interagency funding mechanisms in the past, including State Revolving Fund loans and regional Flood Authority debt, to support infrastructure investments. Capital projects are typically funded through a mix of local assessments, grants, adopted District budgets, and partner agency contributions. The Napa Countywide Stormwater Pollution Prevention Program, funded by member agencies and administered through the district, further supports compliance, inspections, pollution prevention, watershed protection, and flood mitigation activities.

Education & Outreach

NCFCWCD benefits from a variety of education and outreach resources that support hazard awareness, emergency preparedness, and watershed stewardship. Many of these efforts are coordinated through Napa County OES and countywide programs, including Ready Napa County, which provides information on hazard awareness, emergency alerts, preparedness planning, evacuation readiness, and recovery.

Public communication is supported through county social media channels, NCFCWCD's social media presence, emergency preparedness guides, stormwater program materials, and district website resources. These tools help share emergency updates, flood protection project information, flood concern reporting procedures, watershed management updates, and stormwater education.

Additional outreach is supported through partnerships with Fire Safe Councils, Firewise programs, and the Napa County Resource Conservation District. These partners provide education related to wildfire risk reduction, fuels management, watershed protection, habitat stewardship, and environmental monitoring. Together, these resources provide a strong foundation for public education, with opportunities to continue expanding hazard preparedness and watershed-focused outreach.

ASSESSMENT LEGEND
HMP Integration

Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Table 8-12: NCFCWCD Capabilities and Opportunities Assessment

Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Planning and Regulatory Capabilities				
Hazard Reduction Programs (Annually Conducted)				
Capital Improvements Program (CIP) or Plan				Napa River/Napa Creek Flood Protection Project uses "living river" design toward 100-year protection; Stream Maintenance & Watershed Management provide annual vegetation/sediment/channel maintenance; Board routinely approves annual SMP work (e.g., CCC crews)
Annual Fire Prevention Plan				District is not a fire agency; no standalone annual fire prevention plan—coordinate vegetation/fuels work along channels with County Fire/Cal Fire as a co-benefit
Seismic Safety Program (Non-structural)				No standalone non-structural seismic safety program published; opportunity to formalize preparedness/continuity for District facilities
Earthquake Modernization Plan (Building Safety)				District is not a building-safety AHJ; no earthquake modernization plan—track host-jurisdiction building-safety updates for District facilities
Stormwater Management Program (Annual Inspections)				
Hazard Plans and Programs				
Floodplain Response Plan				Napa County OES maintains the Emergency Operations Plan; county floodplain regulations guide response and recovery; opportunity to tie actions to gauge thresholds and evacuation zones

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Community Wildfire Protection Plan (CWPP)				District supports wildfire-related access/fuels work where it intersects riparian/stream corridors; primary CWPP ownership is fire agencies; align channel vegetation with evacuation-corridor priorities
Ground Water Management Planning / Plans				Participates with County GSA on the Napa Valley Subbasin Groundwater Sustainability Plan; coordinates data/GIS and watershed linkages; expand multi-benefit recharge and floodplain projects
Climate Action Plan				Collaborates through the Regional Climate Action & Adaptation Plan; integrate flood-risk reduction and nature-based solutions into RCAAP actions
Drought Mgmt/ Contingency Plan				Participates in the Napa Valley Drought Contingency Plan with regional agencies; coordinate drought–flood nexus projects such as recharge and storage operations
FireWise Communities within District				Firewise administration lies outside the District; coordinate stream access and fuels work where relevant to Firewise neighborhoods; use official county readiness channels for public info
Hazard-Related Public Outreach Program				Countywide Stormwater Program (NCSPPP) and Flood Project pages provide education and annual reporting; expand bilingual materials and project dashboards
Administrative and Technical				
Staff Capacity				
Emergency Manager				OES maintains County emergency plans and ALERT Napa County; District coordinates during flood events
Civil Engineer				Andrew S. Butler, P.E., District Engineer provides design/oversight for flood projects

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Dedicated Public Outreach Personnel				Stormwater Program (NCSPPP) and Flood Project pages provide outreach and public information
GIS Specialist and Capability				GIS capability provided via County PBES GIS (Matt Lamborn); used by District/OES
Grant Manager, Writer, or Specialist				Grants handled by administrative/analyst staff; no dedicated grant specialist listed
Other	N/A	N/A	N/A	
Warning Systems/Services				
General				ALERT Napa County provides county-wide mass notifications; evacuation zones and status are displayed in Genasys Protect; County also uses IPAWS/WEA and Hi-Lo sirens
Flood				Flood evacuations: ALERT Napa County sends notices with a link to Genasys Protect to view mapped zones; residents instructed to monitor Genasys and official channels
Wildfire				Wildfire evacuations: ALERT Napa County + Genasys zones with Hi-Lo siren as the audible "time to go" signal
Geological Hazards				Geologic hazards: urgent messages delivered through IPAWS/WEA and ALERT; opportunity to explore ShakeAlert integration for earthquakes
Fiscal Capabilities				
Financial Resources for Hazard Mitigation				
Levy for Specific Purposes with Voter Approval				Measure A funded local share of flood protection; after sunset, a maintenance fund remains for Flood Project costs

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Utilities Fees				District administers State Water Project contracts with pass-through costs and an admin fee; not a retail utility
System Development Fee				District does not levy development impact fees; role centers on flood/watershed programs
General Obligation Bonds to Incur Debt				Debt tools have been used via partner mechanisms (e.g., SRF loan) and through the Flood Authority during Measure A
Special Tax Bonds to Incur Debt				Sales-tax backed debt was managed by the Flood Authority; could be re-established only with new voter revenue
Withheld Spending in Hazard-Prone Areas				Project approach emphasizes flood-risk reduction; land-use siting policies lie with cities/county
Stormwater Service Fees				NCSPPP is funded by member agencies and administered by the District's stormwater manager
Capital Improvement Project Funding				Capital projects are funded through local assessments, state/federal grants, and annually adopted District budgets

Education / Outreach Capabilities				
Education/Outreach Resources				
Website Dedicated to Hazard Topics				Ready Napa County is the official county emergency website with preparedness, alerts, and recovery pages
Dedicated Social Media				Official County Facebook and the District's Instagram highlight emergency updates and flood control projects
Hazard Info. Avail. at Library/ Planning Desk				Flood District Office
Annual Public Safety Events				Ready Napa County features preparedness campaigns that can anchor recurring annual public safety events

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Ability to Field Public Tech. Assistance Requests				Flood Control District page provides reporting guidance; county FAQ lists Floodplain Management contact
Public Safety Newsletters or Printed Outreach				Materials available at Flood District Office
Fire Safe Councils				County pages support Fire Safe Council/Firewise efforts with fuels-reduction resources and funding information
Resource Conservation Districts				Napa County RCD partners on watershed education and monitoring with public resources available online
Other	N/A	N/A	N/A	

8.6.2 NCFCWCD Mitigation Action Plan

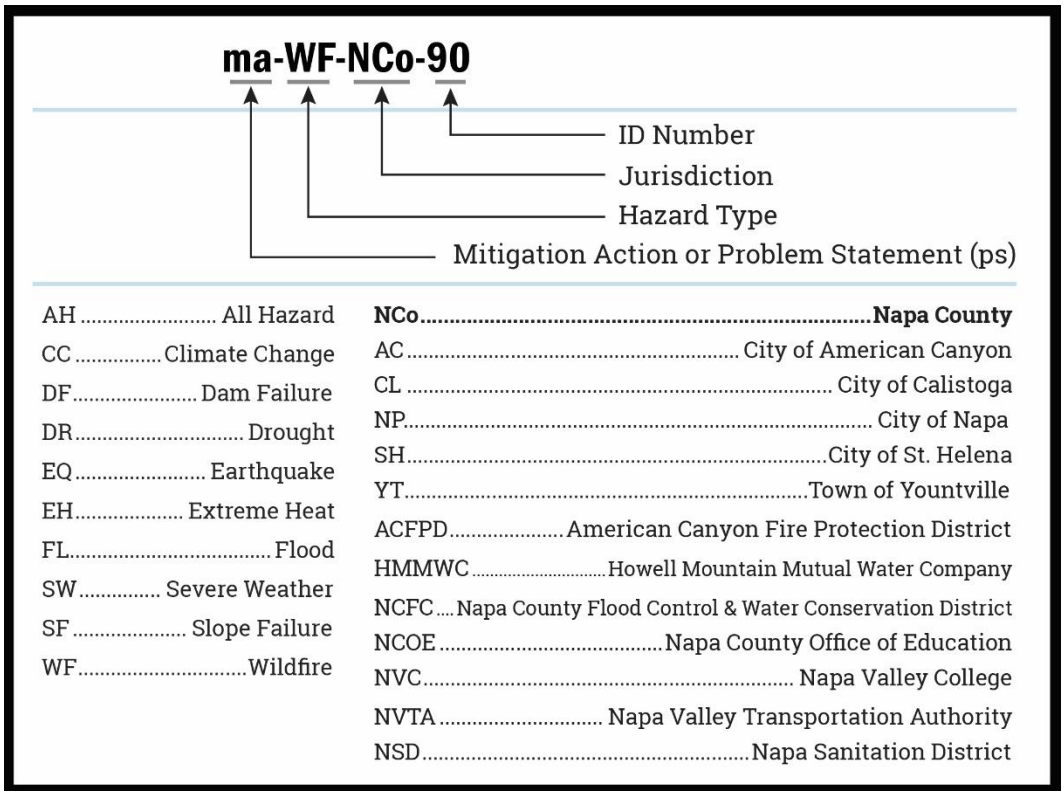


Figure 8-8: Mitigation Action Number Key

NCFCWCD's mitigation actions were developed through a collaborative process informed by the updated risk assessment, local priorities, and extensive stakeholder engagement. As part of this 2026 MJHMP update, the district reviewed mitigation actions from its prior Local Hazard Mitigation Plan to determine which actions to carry forward, which to consolidate, and where entirely new strategies were required. This careful evaluation ensured that the updated action plan builds upon past commitments while also responding to current risks and future challenges. These new actions were crafted to address the district's highest priority hazards, align with FEMA's hazard mitigation guidance, and reflect local infrastructure vulnerabilities and water resource challenges. The development of these mitigation strategies marks an important step in integrating resilience into the district's operations and long-term planning. All mitigation actions are documented in Volume 2, Table 8-13. This careful evaluation ensured that the updated action plan builds upon past commitments while also responding to current risks and future challenges.

The plan addresses NCFCWCD's most significant hazards, including flood, severe weather, and climate change. Each mitigation action is designed to align with FEMA's hazard mitigation guidance and the requirements of the Disaster Mitigation Act of 2000. Where appropriate, overlapping or redundant actions were consolidated into broader, more comprehensive strategies that improve clarity, increase feasibility, and strengthen regional coordination.

The mitigation action prioritization method used by all participating jurisdictions is described in Volume 1, Section 4. Each action specific to NCFCWCD is documented in Table 8-13, which identifies the responsible department, implementation timeframe, potential funding sources, and resources required to complete the

action. Each action is also assigned a unique alphanumeric identifier (see Figure 8-8) that links the strategy to its associated hazard and supports consistent monitoring and reporting.

NCFCWCD's approach recognizes that some hazards are most effectively addressed through regional efforts. Weather and flood reduction often extend beyond the district's boundaries and require collaboration with county, regional, and state partners. By aligning local actions with regional strategies, NCFCWCD helps to consolidate resources, maximize funding opportunities, and ensure that mitigation projects achieve the greatest benefit for San Pablo Bay, the Napa Valley, and the wider Napa County community.

Collectively, these mitigation actions provide a roadmap for reducing hazard risk, protecting vulnerable populations, and strengthening the long-term resilience of NCFCWCD.

Table 8-13: NCFCWCD Mitigation Action Plan

Mitigation No.	Hazard Type	Sub-Hazard	Mitigation Type	Year	Primary Agency	Title	Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Problem Statements
ma-CC-NCFC-244	Climate Change	Sea Level Rise	PRV - Prevention	2026	Napa County Flood Control and Water Conservation District	Sea Level Rise & Climate Impact Flood Modeling	Update hydrologic and flood models to account for anticipated sea-level rise and climate-adjusted rainfall intensities.	Engineering	Medium	Low	3-5 Years	Project	HMGP / BRIC , General Fund	Medium	ps-CC-NCFC-370, ps-CC-NCFC-371
ma-CC-NCFC-245	Climate Change		PRV - Prevention , PE&A - Public Education & Awareness	2026	Napa County Flood Control and Water Conservation District	Climate Change Resilience Plan & Outreach	Collaborate with others to develop a climate change resilience plan that identifies adaptive water operation and conservation strategies, as well as public outreach strategies for a range of future scenarios (e.g., severe weather, sea-level rise, extreme heat, and extended drought).	Administration	Low	Medium	1-3 Years	Capacity / Capability Building	HMGP / BRIC , General Fund	Low	ps-CC-NCFC-371, ps-CC-NCFC-370, ps-SW-NCFC-142, ps-FL-NCFC-104
ma-FL-NCFC-64	Flood		ES - Emergency Services	2013	Napa County Flood Control and Water Conservation District	Enhance Countywide Storm Watch System	Enhance stream flow/level and precipitation monitoring system, including expanded data sharing and collaboration with regional partners and addition of key monitoring points as needed.	Engineering	Medium	High	1-3 Years	Capacity / Capability Building	HMGP / BRIC , FMA , General Fund	Medium	ps-FL-NCFC-103, ps-FL-NCFC-104, ps-SW-NCFC-142, ps-CC-NCFC-371
ma-FL-NCFC-65	Flood		SP - Structural Projects	2013	Napa County Flood Control and Water Conservation District	Measure "A" Flood Control Completion	Complete final construction phases of the Measure "A" Flood Control Project and re-map the City of Napa floodplain to reflect new extent, including evaluation of areas outside floodwall projects.	Engineering	High	High	3-5 Years	Project	HMGP / BRIC , FMA , General Fund	High	ps-FL-NCFC-103, ps-FL-NCFC-104, ps-CC-NCFC-370, ps-CC-NCFC-371
ma-FL-NCFC-66	Flood		PRV - Prevention , NRP - Natural Resource Protection	2013	Napa County Flood Control and Water Conservation District	Improved Stream Channel Inspection & Maintenance	Implement improved annual inspection and maintenance procedures for stormwater channels to prevent trash and debris accumulation, sedimentation and gravel buildup, invasive species and vegetation encroachment, and erosion and bank stabilization impacts.	Engineering	Low	High	1-3 Years	Capacity / Capability Building	HMGP / BRIC , FMA , General Fund	High	ps-FL-NCFC-103, ps-FL-NCFC-107, ps-FL-NCFC-106, ps-SW-NCFC-142, ps-FL-NCFC-105, ps-CC-NCFC-371
ma-FL-NCFC-67	Flood		NRP - Natural Resource Protection	2013	Napa County Flood Control and Water Conservation District	Napa River Restoration Program	Design and implement projects along the Napa River that restore floodplain functionality and connectivity to support increased flood resilience, enhanced recreational opportunities, and improved fish habitat.	Engineering	High	High	5-10 Years	Project	HMGP / BRIC , FMA , General Fund	Medium	ps-FL-NCFC-103, ps-FL-NCFC-105, ps-FL-NCFC-104, ps-FL-NCFC-105, ps-FL-NCFC-106, ps-FL-NCFC-107, ps-CC-NCFC-371
ma-SW-NCFC-243	Severe Weather		NRP - Natural Resource Protection , SP - Structural Projects	2026	Napa County Flood Control and Water Conservation District	Stormwater Capacity Improvement Program	Identify, assess, and upgrade undersized culverts, detention basins, storm drains, and other stormwater infrastructure to manage high-intensity rainfall, including through nature-based and green infrastructure solutions.	Engineering	High	High	3-5 Years	Project	HMGP / BRIC , FMA , General Fund	Medium	ps-SW-NCFC-142, ps-FL-NCFC-104, ps-FL-NCFC-105, ps-CC-NCFC-371

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8.6.3 Status of Previous Mitigation Actions

In 2020, the NCFCWCD adopted its previous FEMA-approved HMP. This 2026 MJHMP represents a comprehensive update from that previous plan, as discussed in Volume 1, Section 1.5. Table 8-14 provides status updates for all of the previous mitigation actions in the NCFCWCD HMP, from which many of the mitigation actions in Table 8-13 were sourced and revised.

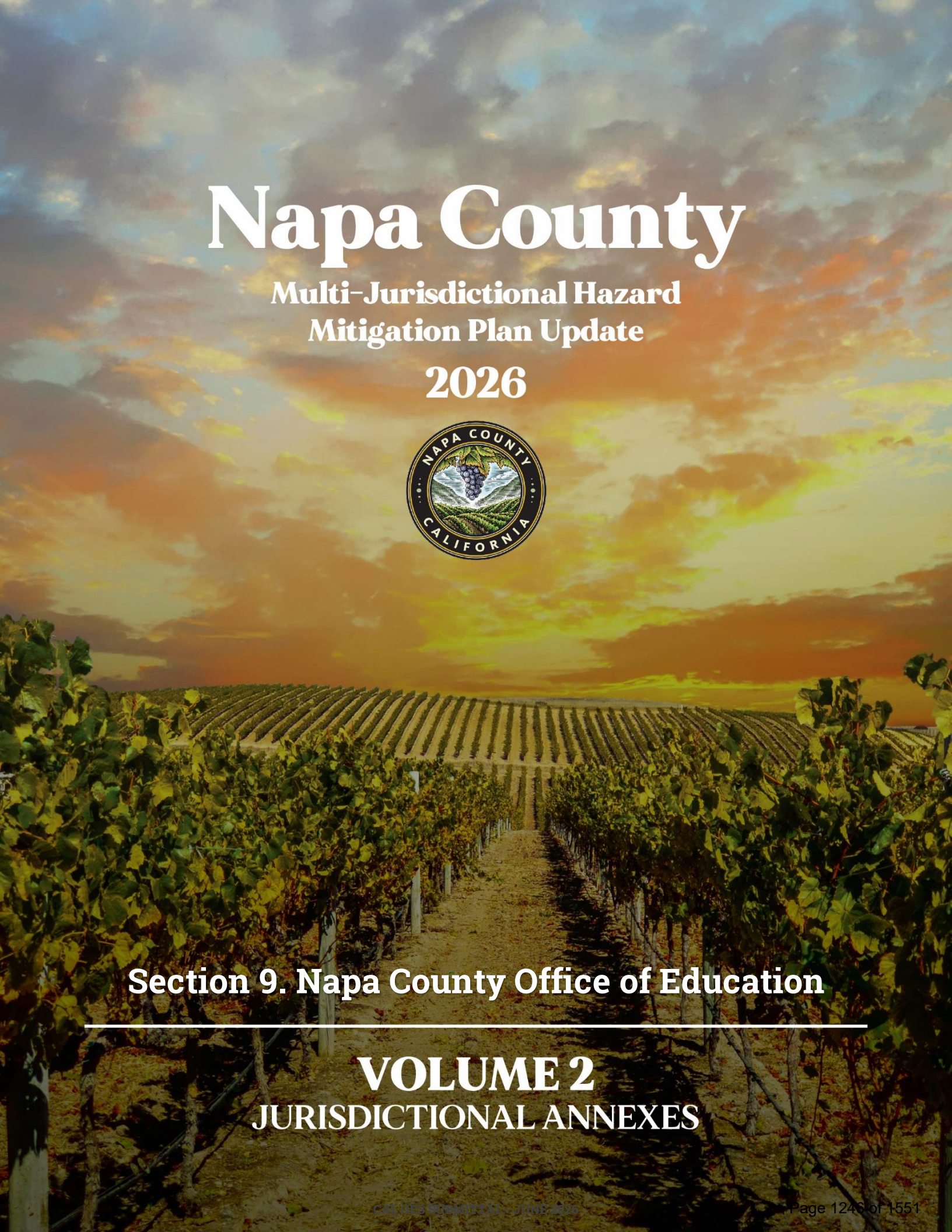
Table 8-14: NCFCWCD Status of Previous Mitigation Actions

Mitigation No.	Hazard Type	Status	Year	Primary Agency	Title/Description	Reason Cancelled/ Completed
ma-FL-NCFC-64	Flood	Ongoing	2013	NCFCWCD	Enhance Countywide Storm Watch System	Revised
ma-FL-NCFC-65	Flood	Ongoing	2013	NCFCWCD	Measure "A" Flood Control Completion	Revised
ma-FL-NCFC-66	Flood	Ongoing	2013	NCFCWCD	Improved Stream Channel Inspection & Maintenance	Revised
ma-FL-NCFC-67	Flood	Ongoing	2013	NCFCWCD	Napa River Restoration Program	Revised
ma-SW-NCFC-123	Severe Weather	Cancelled	2020	NCFCWCD	Routinely inspect storm water channels for vegetation build up or encroachment, trash and debris, silt and gravel build up, and erosion or bank failure	NFC-03-2013 & NFC-204-2020 combined and revised

Napa County

Multi-Jurisdictional Hazard Mitigation Plan Update

2026



Section 9. Napa County Office of Education

VOLUME 2
JURISDICTIONAL ANNEXES

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Napa County

2026 Multi-Jurisdictional Hazard Mitigation Plan Update

Napa County Office of Education (NCOE)

Special Agency Annex

Section 9. Napa County Office of Education 9-7

9.1 Scope & Purpose 9-7

9.2 Jurisdictional Setting 9-7

9.2.1 Geography & Climate 9-8

9.2.2 Campus Building Inventory & Lifelines 9-11

9.2.3 Student Body & Staff 9-12

9.2.4 Income & Housing 9-14

9.2.5 Race, Ethnicity & Language 9-16

9.2.6 Social Vulnerability Index (SVI) 9-18

9.2.7 Economy 9-19

9.2.8 Growth Trends & Future Development 9-19

9.3 Planning Process 9-20

9.3.1 Public Input & Draft Review 9-22

9.4 What's New 9-23

9.4.1 Mitigation Activities 9-23

9.4.2 Mitigation Successes 9-24

9.5 Risk Assessment 9-25

9.5.1 Hazard Screening & Prioritization 9-25

9.5.2 Vulnerability to Specific Hazards 9-29

9.5.3 Climate Change Impacts & Vulnerable Populations 9-47

9.5.4 Hazard Problem Statements 9-48

9.6 Mitigation Strategy 9-51

9.6.1 Capabilities & Opportunities 9-52

9.6.2 Napa County Office of Education Mitigation Action Plan 9-60

9.6.3 Status of Previous Mitigation Actions 9-64

List of Figures

Figure 9-1: NCOE Geographic Overview Map 9-10
Figure 9-2: NCOE Risk Assessment Matrix 9-27
Figure 9-3: NCOE Wildfire Risk 9-31
Figure 9-4: NCOE Earthquake Risk (M7.1 Hunting Creek Berryessa) 9-34
Figure 9-5: NCOE Earthquake Risk (M6.7 West Napa) 9-35
Figure 9-6: NCOE Flood Risk 9-38
Figure 9-7: Drought Severity Timeline 2000-2025 9-41
Figure 9-8: Mitigation Action Number Key 9-60

List of Tables

Table 9-1: Napa County Schools Student and Staff Population 9-14
Table 9-2: Napa County Income and Poverty 9-14
Table 9-3: Napa County Renter- and Owner-Occupied Housing 9-15
Table 9-4: Student Homeless Counts by District 9-16
Table 9-5: Student Ethnicity by District 9-17
Table 9-6: ELAS Learners by District 9-18
Table 9-7: Student Enrollment from 2015 to 2025 (All Districts) 9-20
Table 9-8: NCOE Planning Team and Steering Group Members 9-21
Table 9-9: NCOE Planning Team Meetings 9-22
Table 9-10: NCOE Document Review of Potential Hazards 9-26
Table 9-11: NCOE Hazards Prioritization Summary 9-28
Table 9-12: NCOE Facility Wildfire Exposure 9-32
Table 9-13: Drought Classifications and Impacts 9-40
Table 9-14: Cal-Adapt Extreme Heat Terms and Thresholds 9-44
Table 9-15: NCOE Hazard Problem Statements 9-48
Table 9-16: NCOE Capabilities and Opportunities Assessment 9-57
Table 9-17: NCOE Mitigation Action Plan 9-62
Table 9-18: NCOE Status of Previous Mitigation Actions 9-64

Adoption Resolution

To comply with the Federal Disaster Mitigation Act of 2000 (DMA 2000), the Napa County Office of Education has officially adopted this 2026 Napa County Multi-Jurisdictional Hazard Mitigation Plan, including Volume 1 in its entirety as well as this Volume 2 municipal annex. The adoption of the MJHMP recognizes the agency's commitment to reducing the impacts of natural hazards within its jurisdiction and across Napa County.

A copy of the agency's adoption record is provided on the following pages. Adoption records for all jurisdictions are summarized in Volume 1, Table ES-1.

ADOPTION RECORD TO BE INSERTED UPON COMPLETION.

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Section 9. Napa County Office of Education

9.1 Scope & Purpose

This Jurisdictional Annex for the Napa County Office of Education of the 2026 Napa County Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) details the hazard mitigation planning elements specific to the agency's planning area. The annex is not intended to be a standalone document but appends to and supplements the information contained in the umbrella plan document (Volume 1). As such, all sections of the umbrella plan, including the planning process and other procedural requirements, apply to and were met by the Napa County Office of Education. This annex provides additional information specific to the city, with a focus on hazard identification and risk assessment, vulnerability assessment, problem statements, mitigation strategy, and capabilities assessment. Below are the Napa County Office of Education Points of Contact:

Primary Point of Contact	Alternate Point of Contact
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9.2 Jurisdictional Setting

The Napa County Office of Education is a county-wide agency that provides support and services to local school districts in Napa County. The agency responsibilities include: 1) ensuring school districts are fiscally accountable and solvent; 2) reviewing and approving school districts Local Control Accountability Plans; 3) providing professional development opportunities; 4) assisting school districts with academic performance initiatives; and 5) providing education to vulnerable students (i.e., those that have been expelled, are incarcerated, are on probation, have severe special needs, and who are early learners). The Office of Education is headed by a County Superintendent and governed by an elected Board of Trustees.

The Office of Education is headquartered in the City of Napa at 2121 Imola Avenue. Several programs are operated out of the Imola Avenue location, as well as the neighboring Camille Creek Community School. The Office of Education also partners with various agencies and service providers who operate at various locations in Napa County that are owned by other public agencies or private entities. For example, the Office of Education partners with Early Learning Services and Child Start, Inc. to operate preschool programs at nine different classrooms across Napa County. One such location is at a property on Myrtle Avenue in the City of Napa owned and operated by the Napa Valley Unified School District that contains several other educational facilities and a football stadium.

This planning effort for the Napa County Office of Education establishes a comprehensive risk assessment framework that encompasses all school districts operating under its jurisdiction. Consistent with the requirements of FEMA's Local Mitigation Planning guidance, the risk assessment systematically identifies hazards, evaluates the exposure of educational facilities and populations, and analyzes potential impacts to school infrastructure, operations, and continuity of services. By integrating district-level data into a unified assessment, this effort ensures that vulnerabilities across all campuses and administrative facilities are consistently evaluated, supporting coordinated mitigation strategies and informed decision-making. This approach aligns with the multi-jurisdictional planning structure of the Napa County MJHMP, which incorporates annexes for participating entities, including the Napa County Office of Education , and reflects FEMA's emphasis on risk-informed planning as the foundation for effective hazard mitigation and resilience-building .

Accordingly, the Office of Education's role in facility-specific risk and emergency preparedness planning is inherently limited for sites that are owned or operated by third parties. While Office of Education staff may be present at these facilities to support educational services, responsibility for maintenance, structural safety, and primary emergency planning remains with the respective property owners or operating agencies. As a result, the Office of Education typically participates in preparedness and coordination efforts in a supporting or advisory capacity, rather than as the lead agency. This distinction is important for accurately defining roles and responsibilities within the mitigation strategy and ensures alignment with FEMA guidance emphasizing clear delineation of jurisdictional authority and capabilities in multi-jurisdictional planning efforts.

- **Year of Establishment:** 1955
- **Student Population (All Napa County School District):** 18,585
- **Staff Population (All Napa County School District):** 849
- **Population Growth (2015-2025, All Napa County School Districts):** -11.5% decrease

9.2.1 Geography & Climate

Napa County encompasses 788 square miles in the North Bay region of the San Francisco Bay Area metropolitan area. The County is bordered by Sonoma County (west), Lake County (north), and Solano County (east and south). Significant topographical features include Mount Saint Helena, the Mayacamas Mountains, the Howell Mountains, the Vaca Mountains, Napa Valley, Pope Valley, and Wooden Valley. The county encompasses several incorporated communities, including the cities of American Canyon, Calistoga, Napa, St. Helena, and the Town of Yountville, along with unincorporated areas such as Angwin, Berryessa Highlands, Deer Park, Oakville, Pope Valley, Rutherford, and Spanish Flat. Figure 9-1 provides a geographic overview of Napa County.

Hydrologically, most of Napa County is within the Napa River watershed, which conveys water from the slopes of Mount Saint Helena in the northern portion of the county to San Pablo Bay in the southern portion of the county. The eastern portion of the county is within the Lake Berryessa (Putah Creek) watershed. Lake Berryessa is impounded by Monticello Dam, owned by the United States Bureau of Reclamation, and operated by Solano Irrigation District. A significant amount of Lake Berryessa water is diverted into the

Putah South Canal, which is part of the Solano Project, and wheeled to Fairfiled, Suisun City, Vacaville, Vallejo and agricultural customers.

The general climate of Napa County can be described as Mediterranean, with cool, wet winters and warm, dry summers. It varies slightly across the county due to terrain and geography. For example, the southern end of the valley, where American Canyon and the City of Napa are located, is cooler than the northern part of the county due to its location near San Pablo Bay (the northern tip of the San Francisco Bay). Winds from the bay cool southern Napa County as far north as Yountville. The St. Helena and Calistoga areas do not encounter those cooling winds and thus tend to be much warmer.

Average annual rainfall in Napa County is less than 21 inches, with over half of the rain occurring in the winter months of December, January, and February. (U.S. Climate Data, 2020) The western side of the valley, in the Mayacamas Mountains, gets more rain and supports redwood and fir forests and numerous water bodies and features. The eastern side of the valley, in the Vacas Mountains, receives much less rain and has desert-like characteristics with scrub brush and cactus. Temperatures in Napa County typically range from a winter high temperature of 55 degrees Fahrenheit (°F) in January and an average summer high of 80°F.

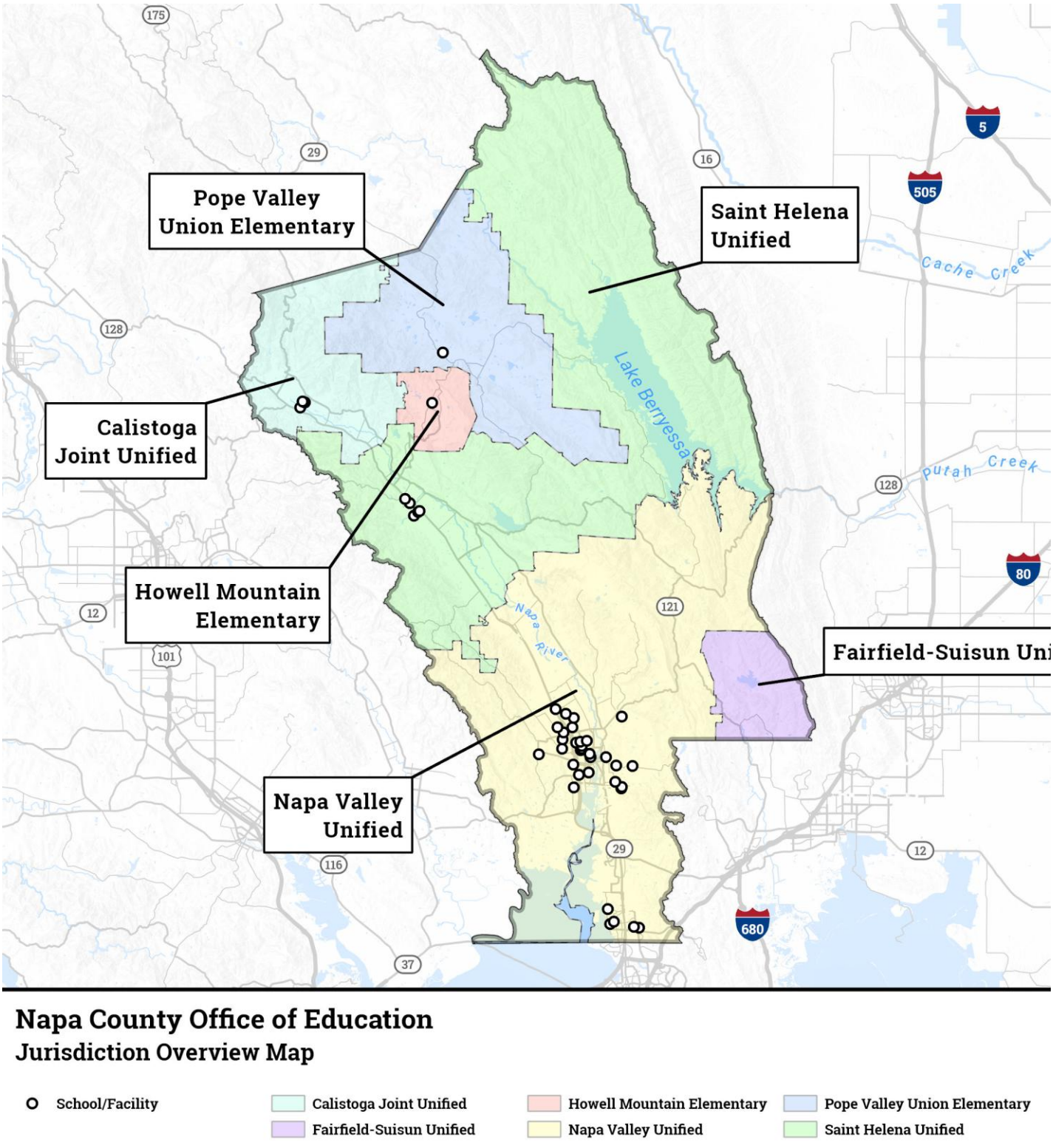


Figure 9-1: NCOE Geographic Overview Map

9.2.2 Campus Building Inventory & Lifelines

The NCOE operates and supports a distributed network of educational facilities and program sites throughout Napa County, rather than a single centralized campus. These facilities include administrative offices, alternative education sites, special education classrooms, and programs that are often co-located within or hosted by local school districts and third-party facilities. As a result, the NCOE building inventory consists of a mix of owned, leased, and shared-use spaces, with varying building ages, construction types, and compliance with modern building codes. Because many NCOE programs are embedded within partner facilities, future development is expected to focus on programmatic expansion, modernization, and coordination with host sites rather than large-scale new construction.

NCOE maintains available facility and operational data to support planning and hazard mitigation; however, responsibility for detailed building characteristics and infrastructure systems may reside with the owning jurisdiction or host district for shared-use facilities. This distributed facility model requires coordination across multiple agencies to support comprehensive vulnerability assessments and mitigation planning.

Safety & Security

Law enforcement services for NCOE facilities are provided by the jurisdiction in which each site is located, including local police departments and the Napa County Sheriff's Office. Because many NCOE programs operate within district or third-party facilities, security functions are typically managed by the host agency, with NCOE staff coordinating as needed. This multi-agency approach supports emergency response but requires clear communication and defined roles across jurisdictions.

Fire protection services are similarly provided by local fire districts and municipal fire departments serving each facility location. NCOE-operated and shared facilities are generally equipped with standard life safety systems, including fire alarms and suppression systems, consistent with applicable codes; however, maintenance and system oversight are often the responsibility of the facility owner.

Water

Water service to NCOE facilities is provided through local municipal or district water systems depending on site location. Because facilities are geographically dispersed and frequently co-located, NCOE does not directly manage water infrastructure in most cases. Water supply reliability is therefore dependent on the host jurisdiction and may be affected by drought, infrastructure failure, or emergency conditions.

Health & Medical

NCOE does not operate full-scale medical facilities but supports student health through program-based services and coordination with local healthcare providers. Emergency medical response is provided by local emergency medical services and nearby hospitals. Access to care during hazard events may be impacted by regional disruptions, including transportation or utility outages.

Energy (Power & Fuel)

Electrical power for NCOE facilities is provided by regional utilities, primarily Pacific Gas and Electric Company. As with other infrastructure systems, NCOE is largely dependent on host facility systems and the broader electrical grid. Backup power availability varies by site and is typically managed by the facility owner, which may limit continuity of operations during extended outages.

Communications

NCOE relies on a combination of communication systems, including internet, telephone, and emergency notification platforms, to support coordination across its distributed sites. These systems are integrated with partner school districts and local emergency management agencies. While generally reliable, communications may be degraded during large-scale hazard events affecting regional infrastructure.

Transportation

Access to NCOE facilities is dependent on the local and regional transportation network, including highways, arterial roads, and local streets serving each site. Because programs are distributed across the county, transportation access varies widely and may be affected by hazards such as flooding, wildfire, or roadway disruptions. This dispersed model requires site-specific evacuation and access planning.

Hazardous Materials

NCOE operations involve limited use of hazardous materials, primarily associated with instructional or support activities within shared facilities. Management of hazardous materials is typically governed by the host site's protocols and regulatory requirements. While risks are generally low, coordination with host agencies is necessary to ensure proper handling and emergency response procedures are in place.

Overall, the decentralized nature of NCOE facilities presents unique considerations for hazard mitigation planning. Unlike a single-campus institution, NCOE must rely on coordination with multiple jurisdictions and facility operators to assess vulnerabilities, implement mitigation measures, and support continuity of operations across its network of educational service locations.

9.2.3 Student Body & Staff

The NCOE serves as a countywide agency responsible for delivering specialized educational programs and services to a diverse and continually changing student population. Its service population changes each academic year; hence, providing a traditional assessment of demographics and vulnerable populations using American Community Survey data would not provide meaningful insight into the Office of Education's service population. Volume 1 provides the demographic characteristics of Napa County as a whole.

Rather than representing a fixed residential population, NCOE supports students across multiple school districts, including Calistoga Joint Unified School District, Howell Mountain Elementary School District, Napa Valley Unified School District, Pope Valley Union Elementary School District, St. Helena Unified School

District, as well as NCOE-operated programs. Due to annual fluctuations in enrollment, program participation, and inter-district service delivery, traditional demographic datasets such as the U.S. Census Bureau American Community Survey (ACS) do not fully capture the characteristics of the population served.

Age is a significant factor in assessing vulnerability to natural hazards, particularly for school-aged populations served by the NCOE and its partner districts. Children are considered a dependent population due to their reliance on caregivers, educators, and institutional systems for safety, mobility, and decision-making during emergency events. This dependency increases risk during disasters such as wildfires, floods, and earthquakes—especially when compounded by additional factors such as housing instability, poverty, or limited access to resources.

To better represent the population relevant to hazard mitigation planning, this assessment utilizes student enrollment and estimated staff data to characterize the population present at educational facilities during normal operations. As summarized in Table 9-1, the combined student population across these districts is approximately 18,585, with an estimated 1,436 staff, resulting in a total daytime population of approximately 20,021 individuals. The majority of this population is concentrated within Napa Valley Unified School District, which accounts for over 85 % of total student enrollment.

This combined student and staff population represents a critical vulnerable group for hazard mitigation planning purposes. School populations include children. who are considered a vulnerable population due to their dependency on supervision, limited mobility, and increased sensitivity to hazards—as well as educators and support staff responsible for emergency response and continuity of services. These populations are typically concentrated in specific facilities during daytime hours, which has important implications for evacuation planning, emergency response, and continuity of operations.

Volume 1 provides the demographic characteristics of Napa County as a whole. The total population, total number of households, and average household size of Napa County and the five incorporated municipalities are presented in Table 9-1. As shown in the table, Napa County's population exceeds 137,000, with an average household size of 2.4 persons.

Table 9-1: Napa County Schools Student and Staff Population

District / Agency	Total Students	Estimated Staff (FTEs)	Total Population (Students + Staff)
Calistoga Joint Unified School District	768	51	819
Howell Mountain Elementary School District	85	11	96.00
Napa County Office of Education	200	38	238
Napa Valley Unified School District	16,381	674	17,055
Pope Valley Union Elementary School District	46	6	52
St. Helena Unified School District	1,105	69	1,174
Total Napa County	**18,585**	**849**	**19,434**

*Source: Data Quest (2024-25 Enrollment) The **total exposed population** (students + staff) represents the population potentially present at school facilities during operational hours*

9.2.4 Income & Housing

The Napa County Office of Education is a countywide agency that provides very specific education and supervision services. Moreover, its service population changes each academic year. Hence, providing a traditional assessment of demographics and vulnerable populations using American Community Survey data would not provide meaningful insight into the Office of Education's service population.

Volume 1 provides the demographic characteristics of Napa Cunty as a whole. Median income and poverty rates for Napa County are summarized in Table 9-2. As shown in the table, the median income for Napa County is close t $106,000 and the poverty rate is close to 8%.

Owner- and renter occupied numbers are provided in Table 9-3. As shown in the table, renters account for 35% of households and owners account for 65% of households in Napa County.

Table 9-2: Napa County Income and Poverty

Area	Median Income	Poverty Rate
Napa County (Unincorporated)	**$105,809**	**7.9%**
American Canyon	$122,694	7.4%
Calistoga	$96,667	5.4%
Napa (City)	$100,273	8.1%
St. Helena	$135,781	5.7%
Yountville	$75,134	10.6%

Source: ACS 5-Year, 2017-2022

Table 9-3: Napa County Renter- and Owner-Occupied Housing

Area	Total Occupied Housing Units	Renter	Rent %	Owner	Own %
Napa County (Unincorporated)	**49,218**	**17,142**	**35%**	**32,076**	**65%**
American Canyon	5,725	1,205	21%	4,520	79%
Calistoga	2,116	776	37%	1,340	63%
Napa (City)	29,443	12,052	41%	17,391	59%
St. Helena	2,466	792	32%	1,674	68%
Yountville	1,516	514	34%	1,002	66%

Source: ACS 5-Year, 2017-2022

Homelessness Among Students

Within Napa County, student data indicate that a subset of the school population experiences homelessness or housing instability, representing a particularly vulnerable group. As shown in Table 9-4, approximately 831 students countywide are identified as homeless, representing about 4.5% of total enrollment. The majority of these students (approximately 80.9%) are classified as "temporarily doubled-up," meaning they are living with other families due to economic hardship. Smaller proportions reside in shelters (6.9%), hotels or motels (10.3%), or are unsheltered (1.9%). These living situations often lack stability, adequate resources, and consistent access to services, increasing vulnerability during hazard events.

Homeless student populations are most concentrated in Napa Valley Unified School District (749 students), with smaller but notable populations in other districts, including St. Helena Unified (26 students), Napa County Office of Education programs (20 students), and Calistoga Joint Unified (16 students). Even in smaller districts such as Howell Mountain Elementary and Pope Valley Union Elementary, the presence of homeless students represents a disproportionately vulnerable subgroup relative to total enrollment.

Students experiencing homelessness face heightened risks during disasters due to unstable housing conditions, limited access to transportation, and reduced capacity to prepare for or recover from emergency events. Those living in doubled-up situations may reside in overcrowded housing, which can complicate evacuation and sheltering. Students in hotels, motels, or unsheltered conditions are particularly exposed to environmental hazards and may have limited access to timely emergency information or services.

In addition, disruptions to school services during disasters can have amplified impacts on homeless students, who often rely on schools for meals, counseling, stability, and access to supportive services. Loss of continuity in education and support systems can further exacerbate existing inequities and delay recovery.

These conditions underscore the importance of integrating housing instability and dependent population needs into hazard mitigation planning. Targeted strategies, such as coordination with social services,

inclusive evacuation planning, and continuity of educational and support services, are essential to reducing risk and improving outcomes for vulnerable student populations.

Table 9-4: Student Homeless Counts by District

District/Agency Name	Cumulative Enrollment	Homeless Student Enrollment	Temporarily Doubled-Up	Temporary Shelters	Hotels/Motels	Temporarily Unsheltered
Calistoga Joint Unified	806	16	100.0%	0.0%	0.0%	0.0%
Howell Mountain Elementary	88	17	100.0%	0.0%	0.0%	0.0%
Napa County Office of Education	185	20	100.0%	0.0%	0.0%	0.0%
Napa Valley Unified	16,519	749	79.6%	7.2%	11.5%	1.7%
Pope Valley Union Elementary	48	4	100.0%	0.0%	0.0%	0.0%
Saint Helena Unified	1,130	26	76.9%	11.5%	0.0%	11.5%
Napa County	**18,776**	**832**	**80.9%**	**6.9%**	**10.3%**	**1.9%**
Statewide	5,227,466	272,500	84.7%	6.2%	5.5%	3.6%

9.2.5 Race, Ethnicity & Language

The Napa County Office of Education is a countywide agency that provides very specific education and supervision services. Moreover, its service population changes each academic year. Hence, providing a traditional assessment of demographics and vulnerable populations using American Community Survey data would not provide meaningful insight into the Office of Education's service population. Volume 1 provides the demographic characteristics of Napa County as a whole.

Natural disasters compound racial disparities; non-white individuals and communities receive less recovery aid from FEMA than their white counterparts, even where the amount of damage is the same. (Howell, Junia; Elliott, James R., 2019) (National Advisory Council, 2020) These disparities are evidence of the complicated relationship between disaster recovery and overlapping social vulnerabilities including race, income, language, and health. Black and Latino residents are more likely to be low income and renters, conditions which create barriers to navigating FEMA's Individual Assistance programs. Communities with more non-white residents may have lower tax revenue and property values, which means less investment in mitigation and rebuilding efforts before and after an emergency.

Table 9-5 illustrates the racial and ethnic composition of the student population served by the Napa County Office of Education and its partner school districts. Consistent with countywide trends, the data indicate

that the school population is diverse, with no single racial or ethnic group exclusively representing all districts. However, Hispanic or Latino students comprise the majority across most districts, accounting for approximately 59.6%g of total enrollment countywide. This is particularly evident in districts such as Calistoga Joint Unified and Pope Valley Union Elementary, where Hispanic or Latino students represent a substantial majority of the student population.

White students represent the second largest group at approximately 24.8% countywide, with higher concentrations in districts such as St. Helena Unified and Howell Mountain Elementary. Smaller proportions of Asian, Filipino, African American, Pacific Islander, and multiracial students are distributed across districts, contributing to the overall diversity of the school system. Napa Valley Unified School District, which serves the largest share of students, reflects this diversity with representation across all racial and ethnic categories.

In addition to racial and ethnic diversity, English language proficiency is a critical factor in assessing vulnerability. As shown in Table 9-6, approximately 22.3% of students countywide are classified as English Learners (EL), with an additional 18.6% identified as Reclassified Fluent English Proficient (RFEP). Certain districts, such as Pope Valley Union Elementary and Calistoga Joint Unified, have particularly high proportions of English Learners, exceeding 25% of total enrollment. These populations may face increased challenges in accessing emergency information, understanding preparedness resources, and navigating disaster recovery processes.

Students with limited English proficiency, along with younger populations requiring supervision and assistance, represent a key vulnerable group in hazard mitigation planning. The concentration of these populations within school facilities during daytime hours underscores the importance of targeted communication strategies, multilingual outreach, and coordinated emergency planning across all districts served by the Napa County Office of Education. This approach is consistent with FEMA guidance requiring the identification of socially vulnerable populations and consideration of access and functional needs within the risk assessment process.

Table 9-5: Student Ethnicity by District

District/Agency Name	Total	African American	American Indian or Alaska Native	Asian	Filipino	Hispanic or Latino	Pacific Islander	White	Two or More Races	Not Reported
Calistoga Joint Unified	**768**	0.5%	0.0%	0.4%	0.5%	87.5%	0.1%	8.3%	0.5%	2.1%
Howell Mountain Elementary	**85**	0.0%	3.5%	0.0%	0.0%	56.5%	1.2%	32.9%	4.7%	1.2%
Napa County Office of Education	**200**	1.0%	0.0%	0.5%	0.0%	70.5%	0.0%	27.0%	1.0%	0.0%

District/Agency Name	Total	African American	American Indian or Alaska Native	Asian	Filipino	Hispanic or Latino	Pacific Islander	White	Two or More Races	Not Reported
Napa Valley Unified	**16,381**	2.4%	0.1%	2.8%	6.5%	58.6%	0.2%	24.2%	5.1%	0.1%
Pope Valley Union Elementary	**46**	0.0%	0.0%	0.0%	0.0%	76.1%	0.0%	23.9%	0.0%	0.0%
Saint Helena Unified	**1,105**	0.7%	0.2%	1.4%	0.1%	52.1%	0.4%	43.5%	1.4%	0.1%
Napa County	**18,585**	**2.2%**	**0.2%**	**2.5%**	**5.7%**	**59.6%**	**0.2%**	**24.8%**	**4.6%**	**0.2%**
Statewide	**5,806,221**	4.9%	0.4%	10.1%	2.2%	56.1%	0.4%	20.0%	4.8%	1.2%

Source: Source: Data Quest (2024-25 Enrollment)

Table 9-6: ELAS Learners by District

Name	Total	English Only (EO)	Initial Fluent English Proficient (IFEP)	English Learner (EL)	Reclassified Fluent English Proficient (RFEP)	To Be Determined (TBD)
Calistoga Joint Unified	**768**	19.8%	3.9%	26.4%	47.7%	2.2%
Howell Mountain Elementary	**85**	60.0%	1.2%	24.7%	11.8%	2.4%
Napa County Office of Education	**200**	48.5%	3.0%	30.5%	18.0%	0.0%
Napa Valley Unified	**16,381**	55.0%	4.1%	22.6%	17.0%	1.3%
Pope Valley Union Elementary	**46**	30.4%	4.3%	52.2%	13.0%	0.0%
Saint Helena Unified	**1,105**	55.5%	7.7%	12.6%	23.2%	1.1%
Napa County	**18,585**	**53.4%**	**4.3%**	**22.3%**	**18.6%**	**1.3%**
State	**5,806,221**	61.0%	4.6%	17.4%	15.7%	1.1%

Source: Source: Data Quest (2024-25 Enrollment)

9.2.6 Social Vulnerability Index (SVI)

The Centers for Disease Control and Prevention (CDC) Social Vulnerability Index (SVI) for the NCOE and additional school districts reveals important spatial and demographic patterns that have direct implications for equitable hazard mitigation planning. As discussed in detail in Volume 1, Section 1.4.3.6, the SVI is a composite measure developed by the CDC to identify communities that are more likely to require support before, during, and after a disaster. It incorporates a range of factors across four key dimensions: socioeconomic status, household composition and disability, minority status and language, and housing

type and transportation access. The resulting index score ranges from 0 (lowest vulnerability) to 1 (highest vulnerability).

The Napa County Office of Education is a countywide agency that provides very specific education and supervision services. Moreover, its service population changes each academic year. Hence, providing a traditional assessment of demographics and vulnerable populations using American Community Survey data would not provide meaningful insight into the Office of Education's service population.

Volume 1 provides a summary of Napa County's SVI as a whole.

9.2.7 Economy

The Napa County Office of Education is a countywide agency that provides very specific education and supervision services. The Office of Education does not directly regulate economic activities through regulation of development or land use activities. It also does not indirectly regulate economic activities through natural resource management or provision of utilities.

Volume 1 provides a summary of Napa County's economy as a whole.

9.2.8 Growth Trends & Future Development

NCOE is a countywide agency that provides specialized educational programs, student support services, and administrative oversight to school districts throughout Napa County. NCOE does not have authority over land use planning, zoning, or development regulation, nor does it influence development through infrastructure provision or natural resource management. As such, growth patterns and land use changes are governed by local jurisdictions and are addressed comprehensively in Volume 1 of this plan.

Although NCOE does not regulate development, student enrollment trends provide an important indicator of population shifts and service demand across the county. As shown in Table 9-7, total student enrollment has declined over the past decade, decreasing from 21,002 students in the 2014–15 academic year to 18,585 students in 2024–25, an overall reduction of approximately 11.5%. The most notable declines occurred between 2019–20 and 2022–23, with enrollment dropping from 20,022 to 18,625 students. In recent years, enrollment has begun to stabilize, with a slight increase observed between 2023–24 and 2024–25.

The data also indicate a shift in the composition of enrollment, with charter school participation declining from approximately 6.3–6.6% in earlier years to 2.2% in 2024–25, while non-charter school enrollment has correspondingly increased. These trends suggest changes in educational preferences and service delivery models within the county.

Overall, while NCOE does not directly influence physical development patterns, enrollment trends reflect broader demographic and socioeconomic changes that are relevant to hazard mitigation planning. Declining and stabilizing student populations may influence facility utilization, transportation needs, and the distribution of services, all of which are important considerations for emergency planning, resource allocation, and long-term resilience.

Volume 1 provides an assessment of growth trends and future development in Napa County as a whole.

Table 9-7: Student Enrollment from 2015 to 2025 (All Districts)

Academic Year	Charter School Enrollment	Non-Charter School Enrollment	Total Enrollment
2024-25	2.2%	97.8%	**18,585**
2023-24	1.9%	98.1%	**18,572**
2022-23	1.4%	98.6%	**18,625**
2021-22	1.4%	98.6%	**19,012**
2020-21	1.4%	98.6%	**19,538**
2019-20	4.6%	95.4%	**20,022**
2018-19	6.5%	93.5%	**20,215**
2017-18	6.6%	93.4%	**20,402**
2016-17	6.5%	93.5%	**20,562**
2015-16	6.4%	93.6%	**20,817**
2014-15	6.3%	93.7%	**21,002**

Source: Source: Data Quest (2024-25 Enrollment)

9.3 Planning Process

The Napa County Office of Education followed the planning process detailed in Volume 1, Section 2, including participating in the county-wide Hazard Mitigation Planning Team (HMPT) and formulating their own internal planning team to support the broader planning process.

The Napa County Office of Education's representatives in the Steering Group led stakeholder and public engagement efforts alongside the Consultant Team, with assistance from the county-wide HMPT and their internal planning team. This engagement process is described in Volume 1. Specifically, for the Napa County Office of Education, this included postings to the city website and social media, and outreach events, as documented in Appendix B. Examples of Key Stakeholders engaged by Napa County on behalf of the city with relevance to the development of Napa County Office of Education's mitigation strategy include the USDA and other federal agencies; CAL FIRE and other state agencies; other jurisdictions; community-based organizations such as local Chamber of Commerce chapters; utility providers like PG&E; UC Davis and other academia; and local businesses.

All Key Stakeholders that were invited to participate in the planning process are listed in Volume 1, Section 2, and the input received from stakeholders was integrated into the offices's annex, as described in Volume 1 Table 2-9. The office's internal planning team participants, their positions, and how they participated in the planning process are shown in Table 9-8.

Table 9-8: NCOE Planning Team and Steering Group Members

Team Members	Title	Description of Involvement
Joshua Schultz	Deputy Superintendent	Lead Point-of-Contact, HMPT #1, and #2, BO #1 and #2
Angel Hernandez	OES Officer	Alternate Point-of-Contact, HMPT #4
Jeremy Smith		Participating Stakeholder, BO #1
Julie McClure	Deputy Superintendent	Participating Stakeholder, BO #1
Seana Wagner	Communications and Special Projects Director	Participating Stakeholder, BO #1

The Napa County Office of Education participated in a comprehensive hazard mitigation planning process as part of the 2026 Napa County MJHMP update. This included a series of breakout meetings, listed in Table 9-9 that engaged the district's planning team, which included key city personnel and stakeholders in evaluating hazards, identifying local vulnerabilities, and prioritizing mitigation strategies.

The process began with a County-Wide Steering Group Kickoff Meeting on February 28, 2024. This initial meeting focused on welcoming participants, establishing a shared understanding of the project scope and schedule, clarifying roles and responsibilities of the Steering Group, the county-wide Hazard Mitigation Planning Team (HMPT), and individual jurisdictional planning teams, and included a review of key changes since the 2020 Local Hazard Mitigation Plan The meeting set the foundation for coordinated participation throughout the planning effort.

On December 10, 2025, participants engaged in a hexagon mapping activity designed to visually identify mitigation actions that could benefit from or require inter-jurisdictional coordination. These collaborative efforts helped shape a refined set of mitigation alternatives, establish shared planning goals, and align local strategies with FEMA's Hazard Mitigation Assistance (HMA) funding framework.

Throughout the series of breakout meetings, the Napa County Office of Education engaged in a structured and collaborative planning process focused on assessing hazard risks, identifying vulnerabilities, and developing targeted mitigation strategies. The meetings began with recaps of the county-wide HMPT meetings to ensure alignment of goals and progress.

During the August 30, 2024, breakout out meeting, discussions concentrated on community engagement outcomes, initial risk assessments, and the integration of demographic data to better understand vulnerable populations. Jurisdictional teams reviewed their specific hazard exposures using the Risk Assessment Mapping Platform (RAMP) and participated in prioritization exercises to identify their top hazards.

The May 9, 2025, breakout meeting shifted toward reviewing local capabilities and defining specific areas of concern, which informed the drafting of problem statements. Teams worked collaboratively to refine

mitigation alternatives, align actions with FEMA guidelines, and develop a shortlist of priority mitigation actions and inter-jurisdictional collaboration opportunities.

The meetings also included consensus-building activities around hazard rankings, capabilities, and planned actions, while providing regular updates on the overall project schedule.

Table 9-9: NCOE Planning Team Meetings

Meeting & Date	Agenda / Topics	Goals / Key Inputs
County-Wide Steering Group and HMPT Kick-off and Meetings #1 & #2 February 28, 2024– July 18, 2024		
Napa County Office of Education Planning Team Breakout Meeting #1 August 30, 2024	▪ County-wide HMPT meetings #1 and #2 recaps ▪ Community engagement progress and results ▪ Risk assessment and community vulnerability ▪ Demographics and vulnerable populations ▪ Overview of jurisdiction-specific hazard risks and exposure ▪ Introduction to Risk Assessment Mapping Platform (RAMP) ▪ Jurisdiction-specific hazard risk ranking exercise ▪ Project schedule updates and next steps	▪ Consensus on jurisdiction-specific priority hazards ▪ Identify capabilities and potential mitigation actions ▪ Community engagement volunteers
County-Wide HMPT Meeting #3 March 25, 2025		
Napa County Office of Education Planning Team Breakout Meeting #2 May 9, 2025	▪ Breakout Meeting #1 and HMPT #3 recaps ▪ Review capabilities assessment ▪ Review areas of concern and define problem statements ▪ Principles of effective mitigation strategies and actions, and mitigation alternatives ▪ Refine and align jurisdiction-specific mitigation actions exercise ▪ Project schedule updates and next steps	▪ Consensus on jurisdiction-specific capabilities ▪ Consensus on jurisdiction-specific areas of concern ▪ Consensus on priority mitigation actions and collaboration opportunities ▪ Community engagement volunteers
County-Wide HMPT Meeting #4 December 10, 2025		

9.3.1 Public Input & Draft Review

As detailed in Volume 1, Section 2, the draft plan was available for public review and comment from May 15 to June 2, 2026. Public comments received during that time were similar to those gathered throughout the public engagement process, including the need for more equity in the distribution of mitigation activities and funding and the need for enhanced cooperation among jurisdictions, utility providers, and state agencies. These comments were incorporated into the office's mitigation strategy, as appropriate; although, most were already addressed by the Mitigation Action Plan which was based on previous public input.

Public and stakeholder input was gathered and incorporated throughout the plan development process, before the public review period, such as from the online public survey (see Volume 1, Section 2.1.2 and Appendix B, for details). During the review period, jurisdictional staff and stakeholders that participated in the plan development also reviewed the public draft and provided comments on minor corrections and revisions, which were addressed in the final plan.

9.4 What's New

This section provides an overview of hazard mitigation planning efforts for the planning area and highlights the updates made in the 2026 MJHMP. The Napa County Office of Education previously participated and maintained a Hazard Mitigation Plan, which guided resilience planning and hazard mitigation actions at the office level. The Napa County Office of Education is updating their current plan on a county wide level. This integration reflects the office's ongoing commitment to regional resilience and acknowledges that many hazards such as flooding, severe storms, and earthquakes cross jurisdictional boundaries.

Through participation in the MJHMP, the Napa County Office of Education has identified its highest priority hazards, developed hazard specific problem statements, and proposed actionable strategies to reduce risks. By aligning with countywide partners and leveraging regional resources, the Napa County Office of Education has strengthened its capacity to prepare for, withstand, and recover from disasters while continuing to protect its unique community character.

9.4.1 Mitigation Activities

The Napa County Office of Education has successfully implemented several initiatives aimed at addressing identified vulnerabilities. Some of these accomplishments are highlighted in this section and have directly contributed to reducing risks from hazards such as flooding, all hazards, and severe weather. These completed projects showcase the Napa County Office of Education's ability to effectively plan, fund, and execute measures that protect its residents and infrastructure.

In addition, the Napa County Office of Education has systematically reviewed and adjusted its mitigation actions, exemplifying adherence to FEMA's Planning Policy Guide principles and emphasizing the importance of dynamic and adaptive mitigation planning. By fostering partnerships, leveraging funding opportunities, and prioritizing equity in implementation, the office aligns with best practices to build resilience against natural disasters. This ongoing effort is a testament to the offices's commitment to the principles of risk-informed decision-making, equitable resource allocation, and integration with broader regional and state hazard mitigation objectives.

Adjustments to Previous Mitigation Actions

A significant portion of the office's mitigation efforts remain ongoing or in the pipeline. These actions, ranging from infrastructure upgrades to community outreach initiatives, represent the office's proactive approach to addressing hazards as resources become available.

Recognizing constraints such as limited funding, staffing, and shifting priorities, the office has reevaluated certain initiatives, leading to their reprioritization or canceling of mitigation actions. Factors such as feasibility, cost-effectiveness, and emerging risks informed these decisions, ensuring alignment with the office's updated hazard mitigation goals. Adjustments to previous mitigation actions are documented as part of the Napa County Office of Education's Mitigation Action Plan Table 9-17, and more specific status updates are provided in Table 9-18.

9.4.2 Mitigation Successes

NCOE has taken a proactive and locally driven approach to hazard mitigation, implementing a variety of projects that enhance campus resilience without reliance on FEMA grant funding. Through strategic capital improvements, facility upgrades, and partnerships with technical experts, the office and school districts have advanced meaningful risk reduction measures that address its most pressing hazards, particularly earthquakes, flooding, and infrastructure vulnerabilities.

These efforts reflect the office's ability to integrate mitigation into routine planning, maintenance, and capital investment decisions. By leveraging institutional resources, state funding programs, and internal expertise, the office and the Napa County school districtsa have demonstrated that effective mitigation can be achieved through sustained commitment and thoughtful planning. The following success stories highlight innovative and impactful actions that have strengthened the safety, reliability, and long-term resilience of campus facilities and operations.

Schools for Climate Action

The Napa Valley Unified School District (NVUSD) has demonstrated an ongoing commitment to climate resilience and hazard mitigation through continued participation in climate action and sustainability initiatives. Building on student-led efforts and community engagement, the District has supported programs that promote energy efficiency, environmental stewardship, and climate awareness across school campuses. These efforts contribute to reducing long-term risks associated with hazards such as extreme heat, wildfire smoke, and energy disruptions, while also strengthening the capacity of students and staff to understand and respond to changing environmental conditions.

NVUSD's approach emphasizes integrating mitigation into both educational programming and operational practices, including promoting sustainable campus improvements and fostering climate literacy among students. These ongoing efforts reflect a proactive strategy to address climate-related risks and support community resilience over time.

As a formal step in this commitment, the NVUSD Board of Education adopted a climate action resolution in May 2019, recognizing the importance of addressing climate change and establishing a framework for continued action.

9.5 Risk Assessment

This section focuses on profiling hazards specific to the Napa County Office of Education and assessing their vulnerability independent of the broader county-wide planning area, which has been evaluated in Section 3 of Volume 1. The hazard profiles in Volume 1 discuss overall impacts to the planning area and describe relevant plans, policies, and regulations; past events; location; frequency and probability of future occurrences; severity and extent; warning time; secondary hazards; and climate change impacts. For more information on risk assessment methodologies, see Volume 1, Appendix A.

This section includes a tailored vulnerability assessment, analyzing assets at risk such as population, property, and critical facilities and infrastructure unique to the office, and information on office-specific differences in hazard vulnerability across the planning area. It also identifies total office assets at risk, including people, property, and critical facilities and infrastructure within the office's jurisidiction. In addition, this section presents growth and development trends for the community, offering insights into vulnerabilities and risks that represent the broader context of assets at risk.

9.5.1 Hazard Screening & Prioritization

Members of the Planning Team from each participating jurisdiction came together to collaboratively decide which county-wide hazards would be included in the MJHMP, and which would be excluded. Hazard screening and prioritization took place early in the process and integrated historic data, local knowledge, and consensus opinions to create a risk assessment matrix for the office as well as for each participating jurisdiction. These matrices indicate the priority of hazards prior to further refinement. Details about this process, the results of the discussion, and in-depth profiles for county-wide hazards can be found in Volume 1, Sections 2 and 3.

The Napa County Office of Education's internal planning group used the same hazard identification and prioritization process as the county-wide Planning Team. They reviewed previously prepared hazard mitigation plans and other relevant documents to determine the realm of natural hazards that have the potential to affect the city. Table 9-10 provides a crosswalk of hazards identified in select planning documents, including the 2020 Napa County MJHMP and the 2023 State of California HMP. The crosswalk was used to develop a preliminary hazards list, providing a framework for the group to evaluate which hazards were truly relevant to the Napa County Office of Education and which ones were not.

The internal planning group then ranked hazards based on their probability of affecting the Napa County Office of Education and potential impacts on the community. Figure 9-2 displays the results of the hazard risk ranking exercise that was performed before further refinement. All hazards have been profiled in Volume 1 of this document. The purpose of this annex is to specifically address the office's vulnerability to specifically identified hazards.

Table 9-10: NCOE Document Review of Potential Hazards

Hazard	2020 Napa County MJHMP	Plan	2023 California SHMP
Agricultural Pests	■		■
Avalanche			■
Climate Change	■	■	■
Coastal			■
Dam Failure	■		■
Drought	■	■	■
Earthquake / Liquefaction	■	■	■
Extreme Cold			■
Extreme Heat		■	■
Extreme Weather / Storms	■	■	■
Flood	■	■	■
Geologic / Mass Movement	■	■	■
Human-Caused			■
Insects			■
Levee Failure			■
Pandemic Disease	■		■
Sea Level Rise			■
Soil			■
Subsidence			■
Tornado			■
Tsunami / Seiche Wave			■
Volcano			■
Wildfire	■	■	■

Risk Assessment Matrix Definitions

PROBABILITY RATING

The likelihood of a hazard event occurring within a time period?

PROBABILITY

- **Highly Likely** - **Highly likely** - 100% annual probability. Or Likely to occur every year in your lifetime.
- **Likely** - **Likely** - between 10 & 100% annual probability. Or will occur several times in your lifetime.
- **Possible** - **Possible** - between 1 & 10% annual probability. Or Likely to occur some time in your lifetime.
- **Unlikely** - **Unlikely** - less than 1% annual probability. Or unlikely but possible to occur in your lifetime.

IMPACT RATING

In terms of injuries, damage, or death, would you anticipate impacts to be minor, limited, critical, or catastrophic when a significant hazard event occurs? The impact could be in terms of one hazard event (flooding from a culvert failure) or a large-scale event (multiple rivers flooding) in the same jurisdictional boundary.

IMPACT

Minor	Limited	Critical	Catastrophic

Minor - very few injuries, if any. Only minor property damage & minimal disruption on quality of life. Temporary shutdown of critical facilities.

Limited - minor injuries only. Approx. 10% or less of property in disaster footprint damaged or destroyed. Complete shutdown of critical facilities for more than one day.

Critical - multiple deaths/injuries possible. Between 25% and 50% of property in disaster footprint is damaged or destroyed. Complete shutdown of critical facilities for more than one week.

Catastrophic - high number of deaths/injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for 30 days or more.

To concentrate resources, the jurisdictional planning team will focus on "High" and "Extreme" risk hazards, and "Medium" risk hazards to a lesser extent. These hazards have the higher probability and greater impact as it relates to the jurisdictions planning area.

Hazard definitions are included in **Vol. 1** of this plan. Some hazards are discussed as subset hazards— e.g., "Levee Failure" within the "Flood" hazard profile. If a hazard is not present on the risk matrix, is grey, or categorized as a "Low" risk hazard, the jurisdictional planning team felt the hazard had a minimal footprint or impact within their planning area and chose not to profile the hazard.

Hazard Information / Legend:



Climate Change impacts will be addressed within each relevant hazard section within the plan update and as a stand alone section for each jurisdiction. Climate change may change the frequency, duration, or intensity of other hazards profiled.

Napa County Office of Education Risk Matrix

IMPACT

PROBABILITY

	Minor	Limited	Critical	Catastrophic
Highly Likely	Medium	SEVERE WEATHER	Extreme	Extreme
Likely	Medium	DROUGHT	WILDFIRE	Extreme
Possible	Low	FLOOD	EARTHQUAKE	High
Unlikely	Low	DAM FAILURE	Medium	Medium

Figure 9-2: NCOE Risk Assessment Matrix

Note: Hazard naming in the Risk Assessment Matrix may not match the final naming used. Refer to hazards prioritization summary table.

Priority Hazards

The results of the initial risk ranking exercise completed by the office's Planning Team, before further refinement, are identified in the county's completed matrix in Figure 9-2. Table 9-11 provides the final list of priority hazards and subhazards with additional details about why certain hazards were chosen and why others were not prioritized. However, it should be noted that many hazards not prioritized for profiling are briefly discussed as secondary or compounding hazards, and subhazards that were profiled and included in the risk assessment are listed specifically.

Table 9-11: NCOE Hazards Prioritization Summary

Hazard	Priority	Explanation
Earthquake / Liquefaction	**High**	**Profiled in Volume 1, Section 3.3.4, and Section 9.5.2.2 in this annex** (not including Liquefaction due to low probability and impact potential)
Wildfire	**High**	**Profiled in Volume 1, Section 3.3.1, and Section 9.5.2.1 in this annex**
Flood	**Medium**	**Profiled in Volume 1, Section 3.3.2, and Section 9.5.2.3 in this annex**
Levee Failure	-	Profiled in Volume 1, Section 3.3.2; not a priority due to low probability and impact potential
Extreme Weather / Storms	**High**	**Profiled in Volume 1, Section 3.3.5, and Section 9.5.2.5 in this annex as Severe Weather, including High Wind and Heavy Rain** (Winter Weather not a priority due to low probability and impact potential)
Drought	**High**	**Profiled in Volume 1, Section 3.3.6, and Section 9.5.2.4 in this annex**
Geologic / Mass Movement	-	Profiled in Volume 1, Section 3.3.5; not a priority due to low probability and impact potential
Extreme Heat	**Medium**	**Profiled in Volume 1, Section 3.3.8, and Section 9.5.2.6 in this annex**
Agricultural Pests	-	Profiled in Volume 1, Section 3.3.9; not a priority due to being outside jurisdictional mission and authority
Sea Level Rise	-	Profiled in Volume 1, Section 3.3.9; not a priority due to low probability and impact potential
Climate Change	**Medium**	**Profiled in Volume 1, Section 3.3.9, and Section 9.5.2.7 in this annex** and discussed as a compounding hazard in relevant profiles
Dam Failure	-	Profiled in Volume 1, Section 3.3.3; not a priority due to low probability and impact potential

9.5.2 Vulnerability to Specific Hazards

Assessing vulnerabilities exposes the unique characteristics of individual hazards and begins the process of narrowing down which areas within the office are vulnerable to specific hazard events. The vulnerability assessment considered unique local knowledge of hazards and impacts and a GIS overlaying method for examining such vulnerabilities in more depth. Using these methods, the office's planning group estimated vulnerable populations, properties, and assets, and potential losses. In addition, the exposure of office assets to drought, geological, earthquake, wildfire and flood hazards were also considered.

Many of the hazard profiles include a snapshot map and damage estimation tables that illustrate the office's vulnerabilities to those specific hazards. These maps assisted the planning group in understanding the hazard exposure of populations, parcels, and critical facilities and infrastructure. Each snapshot map contains an exposure summary that displays the percentage of the population, the improvement and content value of parcels, and the amount of critical infrastructure that is exposed. For hazards without geospatial extents, such as drought and severe weather, narratives are provided instead of exposure maps and tables.

Based on the hazard prioritization exercise, this vulnerability assessment focuses on seven hazards for the Napa County Office of Education, some of which encompass subhazards such as Heavy Rain

Wildfire
SECTION 9.5.2.1



Earthquake
SECTION 9.5.2.2



Flood
SECTION 9.5.2.3



Drought
SECTION 9.5.2.4



Severe Weather
SECTION 9.5.2.5



Extreme Heat
SECTION 9.5.2.6



Climate Change
SECTION 9.5.2.7



9.5.2.1 Wildfire Hazard

School Districts are exposed to significant wildfire risk due to the geographic distribution of its facilities across Napa County, as shown in Figure 9-3 and summarized in Table 9-12. Unlike a single-campus institution, NCOE operates across multiple school sites embedded within different districts, many of which are located along the wildland–urban interface (WUI), particularly in northern and eastern portions of the county and in more rural areas such as Calistoga, Pope Valley, and St. Helena. These areas are characterized by grasslands, shrublands, and seasonal vegetation that can dry rapidly during summer and fall months, increasing susceptibility to fast-moving wildfires under extreme heat and wind conditions.

As illustrated in the jurisdiction overview map, NCOE-supported facilities are dispersed across multiple districts with varying wildfire exposure levels. Schools located in valley floor areas, such as those within Napa Valley Unified, generally experience lower direct wildfire exposure but remain vulnerable to secondary impacts. In contrast, facilities in more rural and vegetated regions—particularly within Calistoga Joint Unified, Pope Valley Union Elementary, and portions of St. Helena Unified—are more directly exposed to wildfire hazards, including flame front exposure, ember intrusion, and limited evacuation routes.

Wildfire exposure in Napa County is extensive, with large portions of the county falling within Very High Fire Hazard Severity Zones. This places school facilities, students, and staff at risk not only from direct fire impacts but also from cascading effects such as smoke exposure, public safety power shutoffs, transportation disruptions, and emergency evacuations. Given the distributed nature of NCOE facilities, evacuation and emergency response conditions may vary significantly by site, with some locations facing access constraints due to limited roadway connectivity or rural terrain.

NCOE serves a substantial daytime population distributed across these facilities, including students, educators, and staff—many of whom may require assistance during emergency events. Younger populations, individuals with access and functional needs, and students experiencing housing instability may be particularly vulnerable during wildfire incidents. Additionally, because many NCOE programs operate within shared or third-party facilities, coordination with host districts and local agencies is critical to ensure effective emergency planning and response.

A major wildfire event could result in temporary or prolonged closure of educational facilities, disruption to services, and displacement of students and staff. Impacts may include damage to buildings and infrastructure, degraded air quality affecting health and operations, and interruption of transportation and utility systems. Even in areas not directly impacted by fire, regional wildfire activity can necessitate school closures due to smoke conditions or precautionary evacuations.

Climate change is expected to further exacerbate wildfire risk in Napa County by contributing to higher temperatures, prolonged dry periods, and more frequent extreme weather conditions. These trends increase the likelihood of large, high-intensity wildfires and extend the duration of the wildfire season. As a result, continued coordination, preparedness planning, and integration of wildfire risk considerations into operational decision-making are essential to reducing vulnerability and ensuring the safety and continuity of educational services across NCOE-supported facilities.

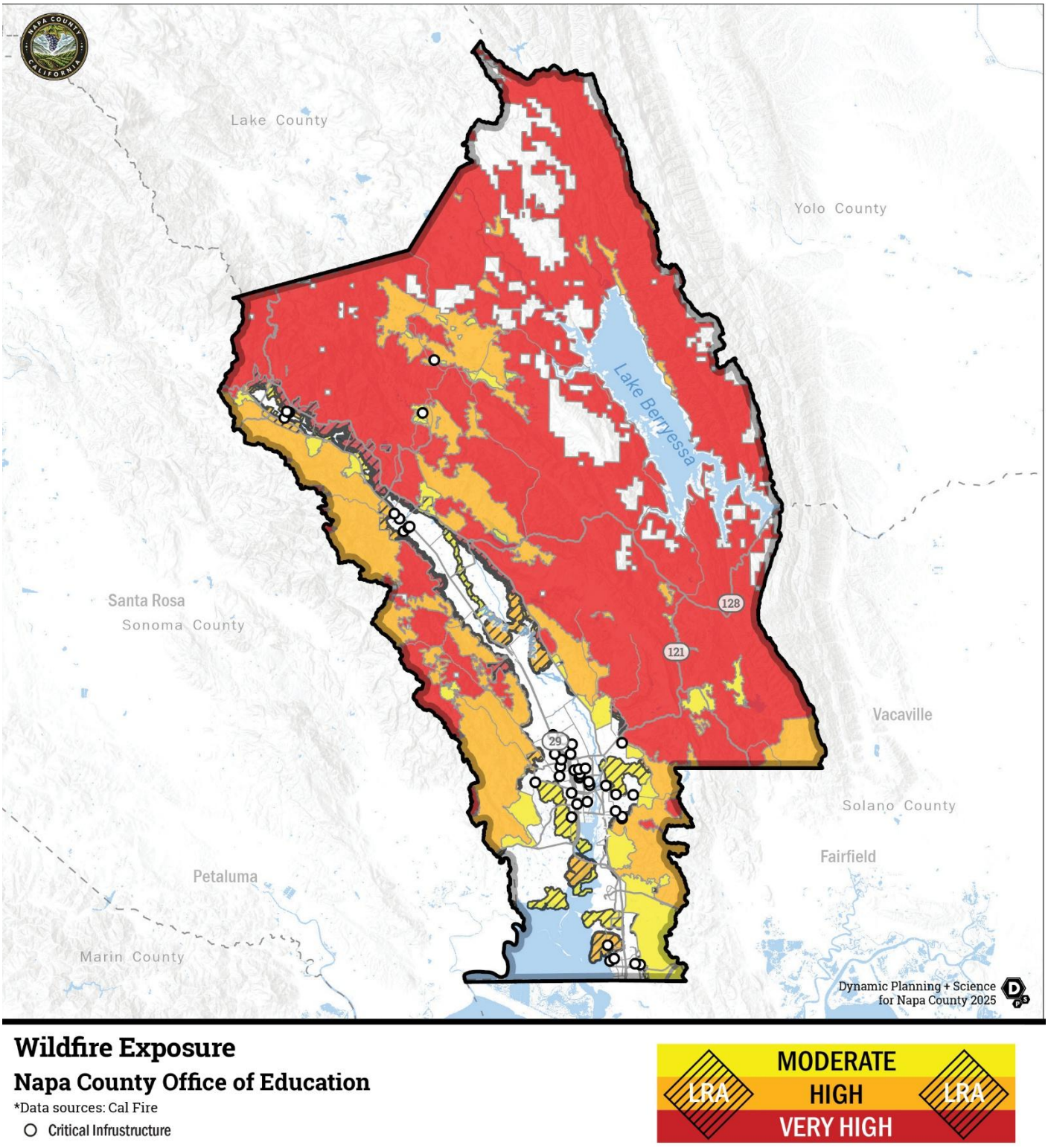


Figure 9-3: NCOE Wildfire Risk

Table 9-12: NCOE Facility Wildfire Exposure

Critical Infrastructure - Wildfire Severity Zone									
Infrastructure Type	SRA Very High	LRA Very High	Very High Total	SRA High	LRA High	High Total	SRA Moderate	LRA Moderate	Moderate Total
Public School	2	-	2	5	3	8	2	2	4
Real Property Asset	-	-	-	1	-	1	-	-	-
Grand Total	**2**	**-**	**2**	**6**	**3**	**9**	**2**	**2**	**4**

**Real Property Assets are digitized insurance rolls for demonstrating value and ownership and may have overlapping points with other categories such as fire stations and law enforcement.*

9.5.2.2 Earthquake Hazard

NCOE and associated school districts are exposed to significant earthquake risk due to the location of its facilities across Napa County, a region influenced by multiple fault systems, including those associated with the 2014 South Napa earthquake. Because NCOE operates a distributed network of schools and program sites rather than a single campus, seismic risk varies by location but remains a countywide concern. Scenario modeling, including the Hunting Creek–Berryessa M7.1 and West Napa M6.7 events, provides a representative understanding of potential impacts to NCOE-supported facilities.

Under the Hunting Creek–Berryessa M7.1 scenario (Figure 9-4), much of Napa County experiences Moderate to Strong ground shaking (MMI V–VI), with areas of Strong shaking (MMI VI) extending across the valley floor where many school facilities are concentrated. Northern and more rural areas, including portions of Pope Valley and St. Helena Unified, experience slightly lower shaking intensities (MMI IV–V), though still sufficient to cause light to moderate damage. While this scenario produces widespread but somewhat lower-intensity impacts compared to more localized events, the distributed nature of NCOE facilities means that nearly all sites would experience some level of operational disruption.

The West Napa M6.7 scenario (Figure 9-5) represents a more consequential event for NCOE due to its proximity to the Napa Valley population center, where the highest concentration of schools and students is located. Under this scenario, much of the valley floor—including areas served by Napa Valley Unified School District—experiences Strong to Very Strong shaking (MMI VI–VII), with localized areas approaching Severe shaking (MMI VIII). This level of ground motion is capable of causing moderate to significant damage to buildings, particularly older structures or those not designed to current seismic standards. Because a large portion of NCOE's student and staff population is concentrated in this area, this scenario presents the greatest risk to life safety and continuity of operations.

NCOE facilities include a mix of building types, ages, and construction standards, many of which are owned and maintained by partner districts. While newer facilities are designed in accordance with modern seismic

codes, older buildings may be more vulnerable to structural damage, nonstructural failures (e.g., ceilings, equipment, utilities), and functional disruption. Variations in local soil conditions across Napa County may also influence shaking intensity and damage potential at specific sites.

A major earthquake could result in injuries, damage to educational facilities, and prolonged disruption of services. Potential impacts include loss of classroom space, damage to equipment and infrastructure, and interruption of critical lifelines such as water, power, and communications. Disruptions to transportation networks may further limit access to school sites, complicating emergency response and reunification efforts.

Because NCOE serves a large and dispersed daytime population, including students, educators, and staff, many individuals may require assistance during emergency situations. Children, individuals with access and functional needs, and transient program participants may be particularly vulnerable during evacuation or sheltering operations. The distributed nature of facilities further increases the importance of consistent emergency planning, training, and coordination across multiple jurisdictions.

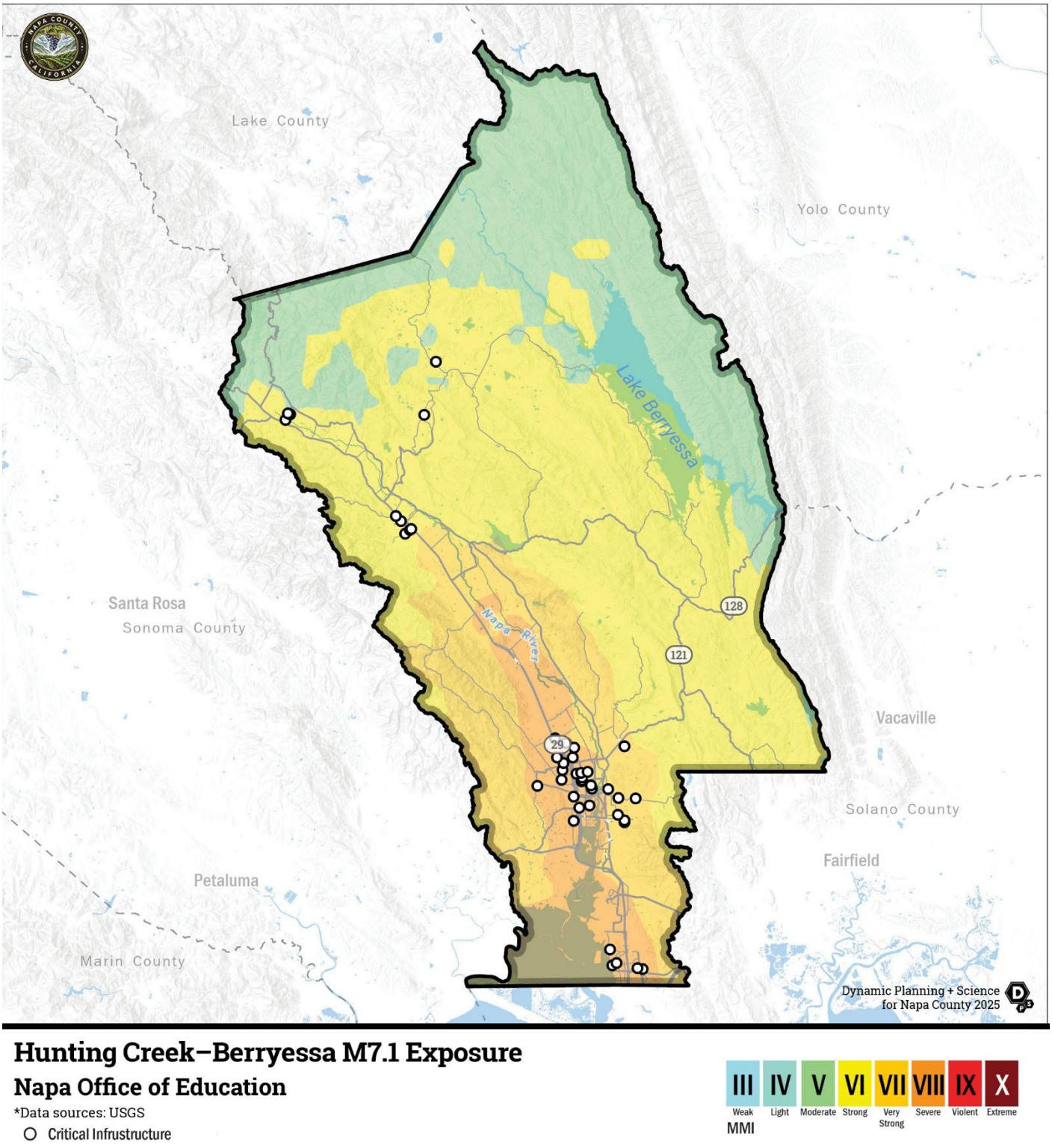


Figure 9-4: NCOE Earthquake Risk (M7.1 Hunting Creek Berryessa)

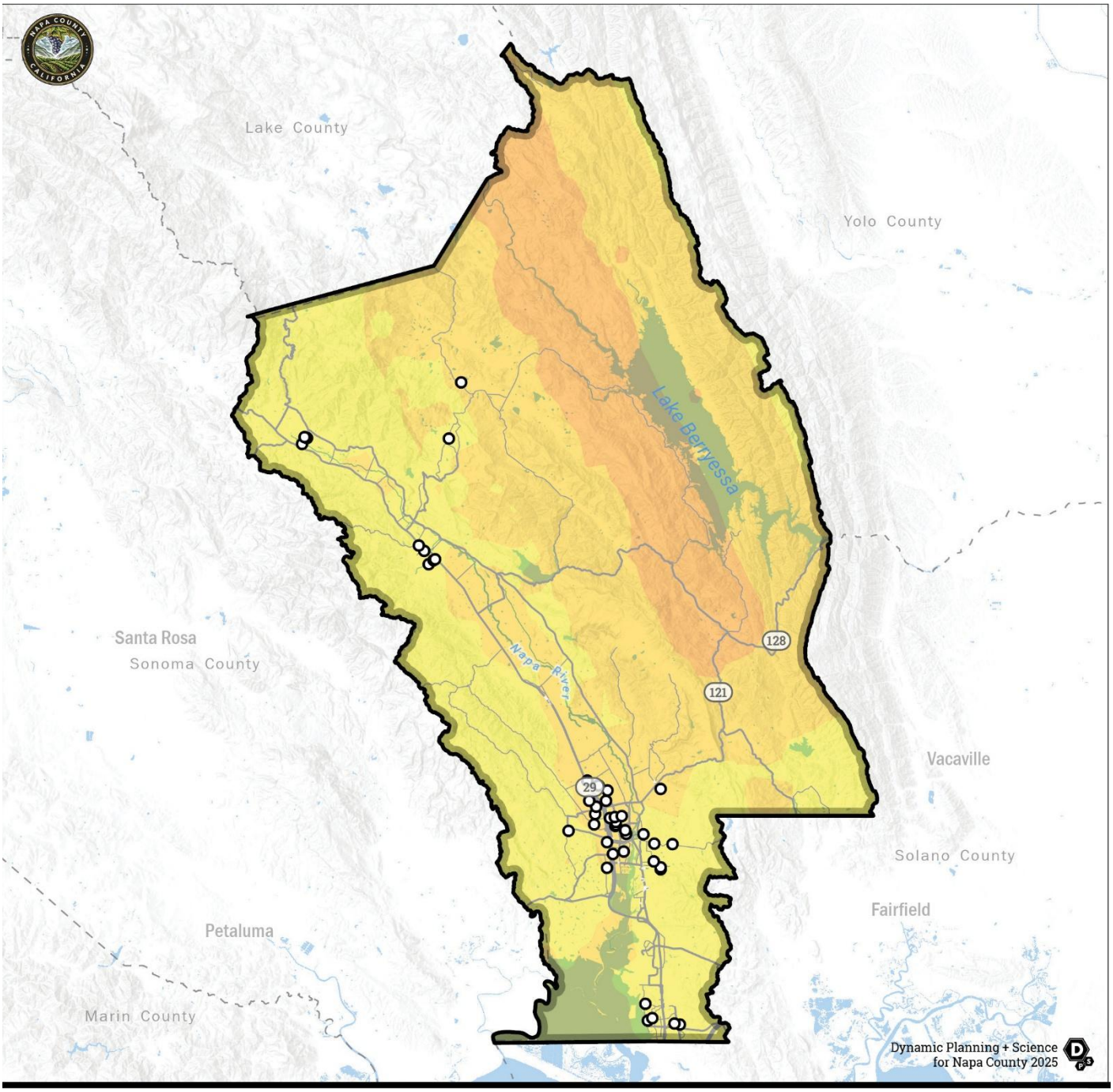


Figure 9-5: NCOE Earthquake Risk (M6.7 West Napa)

9.5.2.3 Flood Hazard

Flooding presents a significant hazard for the Napa County Office of Education (NCOE) due to the geographic distribution of its facilities along the Napa Valley floor and in proximity to the Napa River and downstream bayfront areas. As shown in Figure 9-6, flood-prone areas are primarily concentrated along the Napa River corridor, extending from northern Napa County through the City of Napa and into the low-lying areas near San Pablo Bay. These areas are subject to riverine flooding, localized drainage flooding, and backwater effects influenced by tidal conditions and storm events.

The FEMA Flood Risk Exposure map indicates that several NCOE-supported school facilities—particularly those within Napa Valley Unified School District—are located near or within mapped 100-year (1-% annual chance) and 500-year (0.2-% annual chance) flood hazard zones. Additional areas of concern include designated floodways and levee-protected zones, where flood risk may increase if levee systems are overtopped or fail during extreme events. Facilities located outside of the primary floodplain, such as those in Calistoga Joint Unified, Howell Mountain Elementary, and Pope Valley Union Elementary districts, generally face lower direct flood exposure but may still be affected by localized runoff, roadway flooding, or access constraints.

Flood hazards in Napa County are driven by a combination of intense precipitation, watershed runoff, and tidal influences, particularly when storm events coincide with high water levels in San Pablo Bay. These conditions can overwhelm drainage systems and lead to rapid inundation of low-lying areas. School facilities located in these areas may experience temporary flooding of buildings, parking areas, and access roads, potentially disrupting operations and requiring evacuation or closure.

For NCOE, the distributed nature of facilities increases the complexity of flood risk management. While not all school sites are directly exposed to flooding, many rely on transportation corridors and utility systems that intersect flood-prone areas. As a result, even facilities outside mapped flood zones may experience indirect impacts, including impaired access for students and staff, delayed emergency response, and interruptions to critical services such as power, water, and communications.

Flooding can result in structural damage, mold and water intrusion, and degradation of building systems, as well as impacts to outdoor facilities and equipment. Repetitive or prolonged flooding may also affect long-term facility usability and increase maintenance costs. Secondary impacts include erosion, sediment deposition, and strain on stormwater infrastructure.

National Flood Insurance Program

The National Flood Insurance Program (NFIP) makes federally backed flood insurance available to homeowners, renters, and business owners in participating communities. FEMA has prepared a detailed Flood Insurance Study (FIS) for Napa County and municipalities. The study presents water surface elevations for floods of various magnitudes, including the 1% annual chance flood (100-YR flood) and the 0.2% annual chance flood (500-YR flood). Base flood elevations and the boundaries of the 100- and 500-YR floodplains are shown on Flood Insurance Rate Maps (FIRMs), which are the principal tools for identifying

the extent and location of the flood hazard. FIRMs are the most detailed and consistent data source available, and for many communities they represent the minimum area of oversight under their floodplain management program. See Section 4 of Volume 1 for general information on the NFIP.

The Napa County Office of Education is not a county or a municipality and, thus, is not eligible to participate in NFIP. Volume 1 describes Napa County's participation in NFIP.

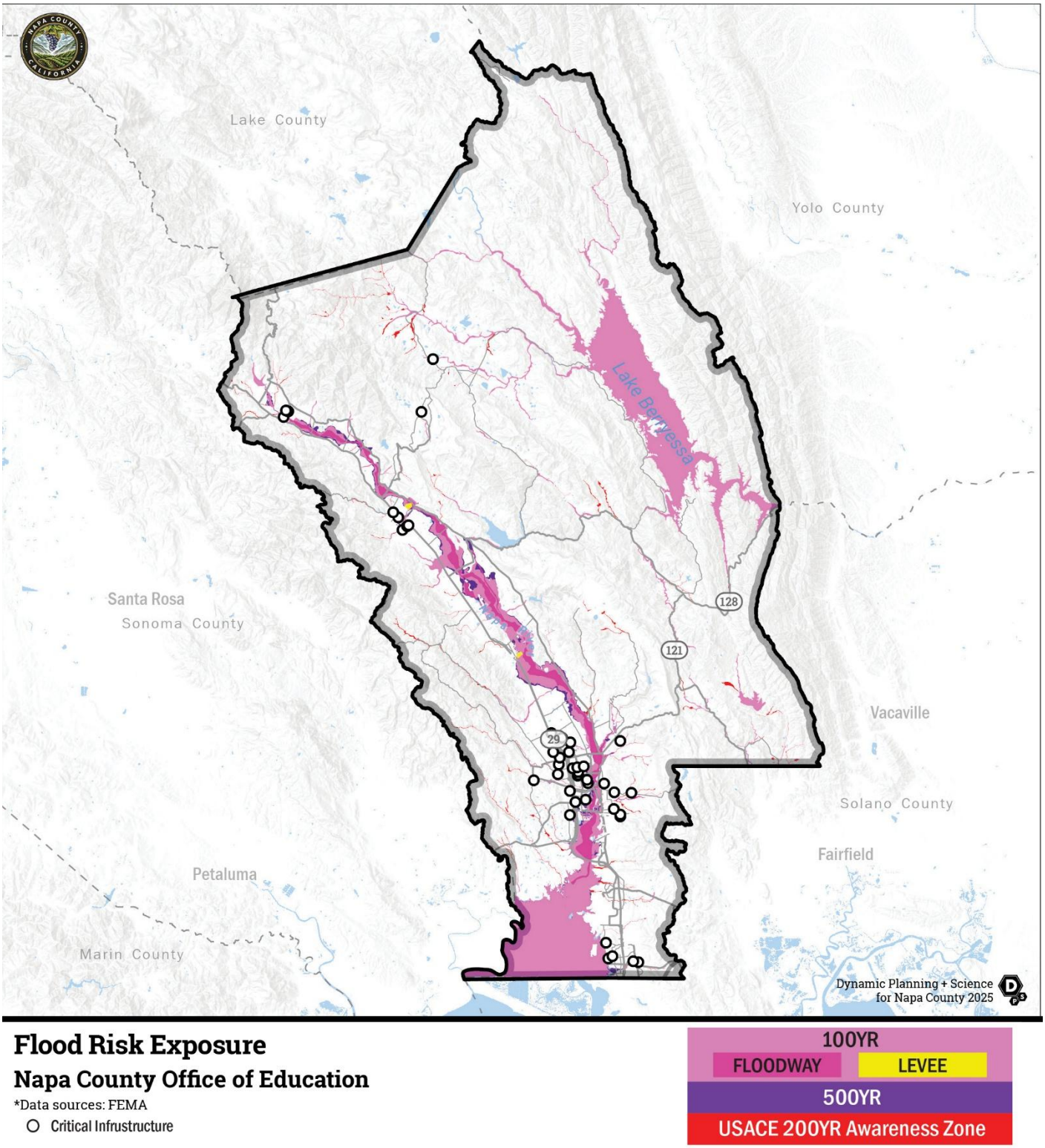


Figure 9-6: NCOE Flood Risk

9.5.2.4 Drought Hazard

The National Drought Monitor provides drought data and maps nationally and on a localized, watershed scale. The National Drought Monitor is the product of 11 agencies, including the NDMC, NOAA and USDA, and is available at http://droughtmonitor.unl.edu/. The National Drought Monitor categorizes the level of drought from D0 through D4, with D4 being the highest "exceptional drought." Table 9-13 depicts drought classifications and impacts from the level of drought occurrence in California, while Figure 9-7 shows a time series of the level of drought in Napa County from 2000 to 2025 according to the National Drought Monitor.

Drought is a recurring and long-term hazard affecting the NCOE and its associated school districts due to the region's Mediterranean climate, characterized by highly seasonal precipitation and extended dry periods. Prolonged intervals of below-average rainfall, reduced snowpack in California's primary water supply regions, and elevated temperatures can strain regional water availability and affect school operations across Napa County. While drought does not typically cause immediate physical damage to school facilities, its cumulative effects can be significant and prolonged, particularly for a distributed system of educational sites.

NCOE and its partner districts rely on local and regional water systems that are sensitive to drought conditions. Extended dry periods can reduce available water supplies, increase demand during hotter conditions, and place stress on water delivery infrastructure. In response, water conservation measures are often implemented, which may affect campus landscaping, irrigation, and facility operations. Schools may be required to modify maintenance practices and operational procedures to comply with regional water use restrictions while maintaining safe and functional learning environments.

Drought conditions can also exacerbate other hazards affecting NCOE facilities. Prolonged dry periods contribute to increased wildfire risk, particularly for schools located near WUI areas in northern and rural portions of the county. Dry soils and vegetation can also contribute to erosion and reduced slope stability, especially when drought conditions are followed by intense precipitation events. Additionally, degradation of natural systems, including riparian corridors along the Napa River, may reduce natural flood attenuation capacity, indirectly increasing flood risk in downstream areas where many school facilities are located.

Climate change is expected to increase the frequency, duration, and severity of drought conditions in California, with longer dry periods and more variable precipitation patterns. These trends create ongoing uncertainty in water supply reliability and reinforce the importance of water conservation, interagency coordination, and sustainable operational practices across NCOE and its partner school districts. Consistent with FEMA mitigation planning principles, integrating drought resilience into facility management and long-term planning efforts is essential to maintaining continuity of educational services and reducing future risk.

Table 9-13: Drought Classifications and Impacts

Category	Description	Possible Impacts
D0	Abnormally Dry	▪ Soil is dry; irrigation delivery begins early ▪ Dryland crop germination is stunted ▪ Active fire season begins
D1	Moderate Drought	▪ Dryland pasture growth is stunted; producers give supplemental feed to cattle ▪ Landscaping and gardens need irrigation earlier; wildlife patterns begin to change ▪ Stock ponds and creeks are lower than usual
D2	Severe Drought	▪ Producers increase water efficiency methods and drought-resistant crops ▪ Grazing land inadequate ▪ Fire season is longer, with high burn intensity, dry fuels, and large fire spatial extent, more fire crews on staff ▪ Lake- and river-based tourism declines; boat ramps close ▪ Trees are stressed; plants increase reproductive mechanisms; wildlife diseases increase ▪ Water temperatures increase; programs to divert water to protect fish begin ▪ River flows decrease; reservoir levels are low and banks are exposed
D3	Extreme Drought	▪ Federal water is not adequate to meet irrigation contracts; extracting supplemental groundwater is expensive ▪ Fire season lasts year-round; fires occur in typically wet parts of the state; burn bans are implemented ▪ Ski and rafting business are low; mountain communities suffer ▪ Low water levels impede fish migration and cause lower survival rates ▪ Wildlife encroaches on developed areas; little native food and water is available for bears, which hibernate less ▪ Water sanitation is a concern; reservoir levels drop significantly; surface water is nearly dry; flows are very low; water theft occurs ▪ Livestock need supplemental feed, cattle and horses are sold; little pasture remains ▪ Well and aquifer levels decrease; homeowners drill new wells
D4	Exceptional Drought	▪ Fire season is very costly; number of fires and areas burned are extensive ▪ Many recreational activities are affected ▪ Fields are left fallow; orchards are removed; vegetable yields are low; honey harvest is small; agricultural unemployment is high, food aid is needed ▪ Fish rescue and relocation begin; pine beetle infestation occurs; forest mortality is high; wetlands dry up; wildlife death is widespread; algae blooms appear ▪ Poor air quality affects health: greenhouse gas emissions increase as hydropower production decreases; West Nile outbreaks rise ▪ Water shortages are widespread; surface water is depleted; federal irrigation water deliveries are curtailed; water prices are extremely high; wells are dry, more and deeper wells are drilled; water quality is poor

Source: Adapted from U.S. Drought Monitor Drought Classifications and Impacts

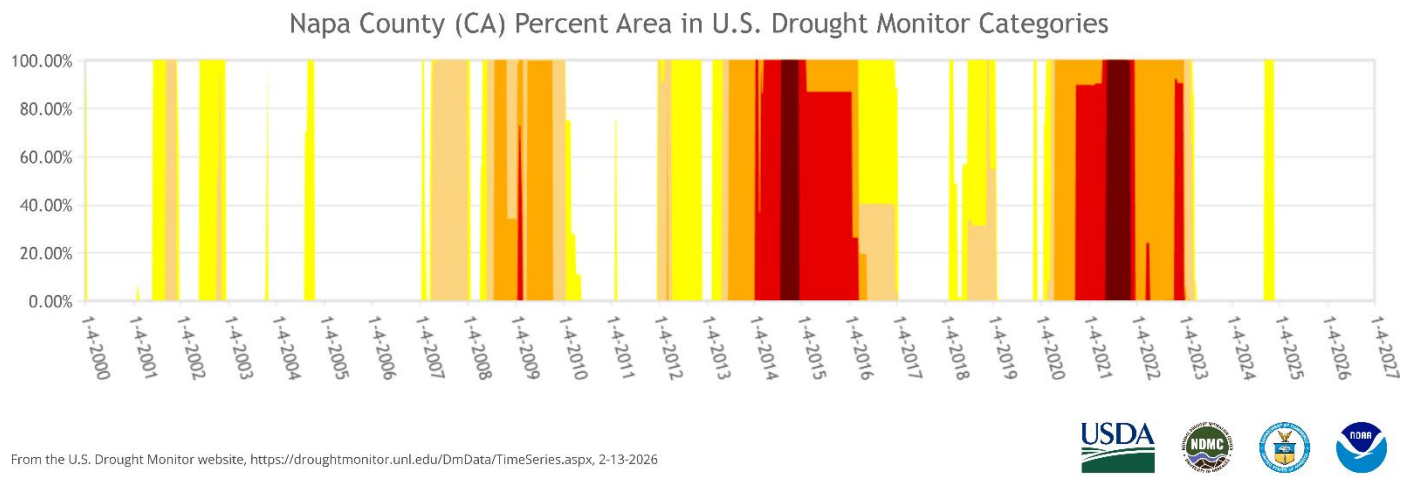


Figure 9-7: Drought Severity Timeline 2000-2025

9.5.2.5 Severe Weather Hazard

Although Napa County benefits from a Mediterranean climate with some moderating marine influence from San Pablo Bay, the Napa County Office of Education (NCOE) and its associated school districts remain vulnerable to a range of severe weather hazards, including high wind events, heavy rainfall, and winter storm systems. While these hazards may occur less frequently or with lower intensity than hazards such as wildfire or earthquake, they can still result in significant impacts to school facilities, operations, and the safety of students and staff across the county.

High Wind

High wind events are a recurring severe weather hazard affecting NCOE-supported facilities, particularly during winter storm systems and offshore wind conditions. Winds may be funneled through the Napa Valley and surrounding hills, producing localized gusts that can impact school campuses across districts including Napa Valley Unified, Calistoga Joint Unified, and St. Helena Unified. These events have the potential to damage buildings, disrupt school operations, and create safety hazards for students, faculty, and staff.

At school sites, high winds may result in downed trees, fallen branches, and windborne debris that can block access roads, parking areas, and pedestrian pathways. Damage to overhead utilities and nearby electrical infrastructure can lead to power outages, affecting classroom instruction, administrative functions, and critical systems such as communications and safety equipment. Outdoor facilities—including play areas, athletic fields, portable classrooms, and signage—may be particularly vulnerable to wind damage.

High winds can also exacerbate other hazards affecting NCOE facilities. During dry conditions, strong winds can increase wildfire risk in surrounding open space and wildland–urban interface areas by accelerating fire spread and transporting embers. In addition, falling debris and reduced visibility during wind events

may create hazardous conditions along key transportation corridors, potentially limiting emergency access or delaying evacuation efforts.

Although many school buildings are constructed in accordance with modern codes, vulnerabilities may exist in older facilities, roofing systems, and exterior components. The reliance on safe access, reliable utilities, and outdoor circulation areas highlights the importance of ongoing maintenance, vegetation management, and emergency preparedness across NCOE-supported sites.

Heavy Rain

NCOE and its partner school districts are also exposed to severe winter storm events that can produce heavy rainfall, localized flooding, and hazardous travel conditions. These storm systems are often associated with atmospheric river events that bring prolonged precipitation, increasing the risk of riverine flooding along the Napa River and its tributaries, as well as localized drainage issues in developed areas where many school facilities are located.

Heavy rainfall can lead to saturated soils, increasing the likelihood of localized slope instability, erosion, and debris flows, particularly in hillside areas where some school facilities and access routes are located. Storm events may also include lightning, short-duration intense rainfall, and occasional hail, all of which can contribute to property damage and safety risks for students and staff.

Severe weather impacts often cascade across multiple systems. High winds and heavy rainfall are closely linked to power outages, transportation disruptions, and infrastructure impacts, which can affect school operations and emergency response. Downed trees, roadway flooding, and debris may block access routes, limiting mobility and complicating student transportation, evacuation, and reunification efforts.

As with other hazards, severe weather events may disproportionately affect vulnerable populations served by NCOE, including students with access and functional needs, low-income households, and those experiencing housing instability. These conditions underscore the importance of integrating severe weather considerations into emergency planning, infrastructure resilience, and coordinated response efforts across all districts.

Severe Weather & Climate Change

Severe weather events pose an increasing hazard for NCOE due to regional climate variability and long-term climate change trends affecting Northern California. Extreme weather includes periods of extreme heat, severe storms, high winds, and atmospheric river events, all of which can strain infrastructure, disrupt educational services, and threaten public safety.

Extreme heat is one of the most significant emerging threats. Increasing temperatures and more frequent heat waves elevate the risk of heat-related illness among students and staff, particularly vulnerable populations such as young children, individuals with health conditions, and those without access to adequate cooling. Extreme heat can also increase energy demand, potentially contributing to power outages

and stressing electrical systems relied upon by school facilities. In addition, prolonged heat events can worsen air quality and compound health risks during wildfire smoke events.

Climate projections indicate that Napa County will experience a substantial increase in extreme heat days and warm nights over time, reflecting broader climate change trends. Severe storms and atmospheric river events are also expected to intensify, producing heavier rainfall over shorter periods and increasing the risk of flooding, erosion, and infrastructure strain. High wind events may become more variable and severe, further compounding wildfire risk and infrastructure vulnerability.

9.5.2.6 Extreme Heat Hazard

Within Napa County, geographic patterns in extreme heat are mostly influenced by topography. Napa County's climate is influenced by its location between mountain ranges and proximity to San Pablo Bay, which typically provides some moderation of temperature extremes. While extreme heat days are defined by localized variation from norms, the inland valley areas tend to experience higher temperatures than coastal or mountain areas. That being said, air conditioning systems are less prevalent in the county, including in older school buildings, and the population may be less adapted to higher temperatures compared to regions which regularly experience high heat events.

However, despite the marine and mountain influences present, the county is increasingly experiencing periods of elevated temperatures, particularly during late summer and early fall when offshore flow conditions reduce coastal cooling effects. In recent decades, Napa has seen an increase in the frequency, duration, and intensity of extreme heat events, a trend that is expected to continue under changing climate conditions. Statewide events, including those in 2017 and 2020, resulted in prolonged periods of high temperatures across inland portions of the Bay Area, including the Napa Valley. During these events, temperatures in Napa exceeded typical seasonal norms and, in some cases, approached or exceeded 100°F for multiple consecutive days.

Although Napa County is mostly rural, there are clusters of highly urbanized areas. Urbanized areas experience higher temperatures than natural landscapes, creating localized pockets of higher temperatures known as heat islands. Roads and conventional building materials reflect less solar energy and absorb and re-emit more heat compared to trees and other vegetation. Heat islands can build throughout the day and worsen immediately after sunset as heat is slowly released from pavement and building material. Urban heat islands disproportionately affect low-income urban populations and people of color, communities who are more likely to occupy older, higher density housing stock with lower urban forest cover and less access to air conditioning.

Napa's valley setting contributes to heat retention, particularly during periods of high pressure and low wind, when warm air becomes trapped and nighttime cooling is limited. These conditions can result in extended heat events that persist over several days, increasing cumulative stress on residents, infrastructure, and natural systems. Unlike areas immediately adjacent to the Bay, portions of Napa experience more pronounced temperature extremes due to reduced marine influence and localized topographic effects.

Climate projections indicate that the county is likely to experience a substantial increase in both the number of extreme heat days and warm nights over time. Extreme heat days, defined as those exceeding historically high temperature thresholds, are expected to become more frequent, while warm nights will reduce opportunities for overnight cooling, compounding heat-related stress on vulnerable populations.

According to Cal-Adapt, the county will likely experience a climate change-driven increase in extreme heat days from four days per year to 22 days per year by the end of the century under a medium emissions scenario (RCP 4.5). Over the same time period, the county is also likely to see an increase in warm nights from five per year to 39. Table 9-14 explains the extreme heat event thresholds for Napa County.

Table 9-14: Cal-Adapt Extreme Heat Terms and Thresholds

Term	Cal-Adapt Definition	Thresholds for Napa County
Extreme Heat Day	Defined as a day in a year when the daily maximum/minimum temperature exceeds the 98th percentile of daily maximum/minimum temperatures based on observed historical data from 1961-1990 between April and October.	**98.6°F**
Warm Night	Defined as a day in April through October when daily minimum temperature exceeds the 98th historical percentile of daily minimum temperatures, based on observed data from 1961-1990 between April and October.	**59.5°F**
Heat Wave	Defined as four consecutive days or nights above the extreme heat / warm night threshold.	**3 days ≥ 98.6°F** or **4 nights ≥ 59.5°F**

Source: Cal-Adapt Extreme Heat Days and Warm Nights Tool

Impacts on Students & Staff

Student and staff health risks are the most immediate concern, with vulnerable populations such as low-income or homeless students or those who are medically fragile, at elevated risk of heat-related illnesses. Among the county's vulnerable populations, the children of agricultural workers or staff living in older homes without air conditioning may be more exposed to heat events than others if nighttime temperatures remain high. In addition, some older school buildings may lack adequate air conditioning to address climate change-driven temperature increases. Heat impacts students and staff physically and mentally, especially if they are further exposed to heat throughout the day or night, and can disrupt educational operations, cause sickness, or even death in extreme cases such as while exercising outdoors.

From an infrastructure perspective, heat waves stress the power grid, raising the likelihood of blackouts that can leave school and district buildings without cooling options. Prolonged extreme heat can also damage roads, rail, and utilities, as well as strain HVAC systems in schools and other critical facilities. Parks, athletic fields, and outdoor programs may face closures due to unsafe conditions, impacting community services and recreation.

Cascading Effects

Extreme heat can contribute to and exacerbate other hazards within Napa County. Prolonged high temperatures dry vegetation and increase wildfire risk in surrounding areas, while also contributing to degraded air quality, particularly during regional wildfire events. Heat can also intensify drought conditions by increasing evaporation rates and water demand, placing additional stress on local water resources.

9.5.2.7 Climate Change Hazard

NCOE faces increasing exposure to climate-related hazards that influence both the frequency and severity of existing risks. Changes in temperature, precipitation patterns, and seasonal variability are expected to intensify hazards such as extreme heat, drought, flooding, wildfire, and severe storms that affect campus operations. Located within the Napa Valley, the College is subject to localized climate conditions shaped by valley topography, nearby waterways, and surrounding open space, all of which contribute to its sensitivity to climate variability. Understanding how these evolving conditions affect the campus is critical for informing long-term planning, infrastructure investment, and emergency preparedness.

Increased Annual Temperatures

Average annual temperatures across most of California have already increased by more than 1°F, with some areas experiencing rises of over 2°F when comparing the 1901–1960 average to that of 1986–2016. Daily maximum temperatures—a key indicator of extreme heat—are projected to increase by 4.4°F to 5.8°F by 2050 and by 5.6°F to 8.8°F by 2100. Heat waves that impact public health, known as heat-health events, are also expected to intensify across the state. By 2050, these events are projected to last up to two weeks longer in the Central Valley and occur four to ten times more often in the Northern Sierra region (California Natural Resources Agency, 2022).

California is already experiencing significant impacts from climate change, including prolonged drought, a lengthened wildfire season, increased coastal flooding and erosion, and widespread tree mortality. The state has observed rising average temperatures, more extreme heat days, fewer cold nights, a longer growing season, and shifts in the water cycle, with less winter precipitation falling as snow. In addition, summertime fog has declined by approximately 33%, and both snowmelt and rainwater runoff are occurring earlier in the year (Cal OES, 2018).

Long-term trends indicate a 12% to 20% decline in fog across California from 1900 through projections to 2070. Climate experts suggest that warming temperatures reduce the ability of air masses to cool enough to produce fog, which plays a critical role in supporting California's ecosystems (Grantham, Teodore; University of California, Berkeley, 2018).

These statewide trends have localized implications for NCOE due to its position within the Napa Valley. The valley setting can intensify heat impacts by trapping warm air and limiting nighttime cooling, resulting in prolonged exposure to elevated temperatures. As extreme heat events increase in frequency and duration, the campus population, including students, faculty, and staff, may experience greater health and safety risks, particularly for those with limited access to cooling or who spend time outdoors. Increased

temperatures may also drive higher energy demand on campus, placing additional strain on electrical systems and increasing the potential for power disruptions.

Drought & Water Reliability

Climate change is expected to increase the frequency and duration of drought conditions affecting the NCOE and its associated school districts. NCOE-supported facilities rely on local and regional water systems that are sensitive to prolonged dry periods, which can reduce water availability and increase demand during hotter conditions. These impacts may necessitate the implementation of water conservation measures that affect school landscaping, irrigation, and facility operations across multiple campuses.

Drought conditions can also affect the broader school environment. Vegetation stress on school grounds and surrounding open space areas may increase maintenance needs and reduce tree canopy, contributing to higher localized temperatures on campuses. In addition, prolonged dry conditions may impact nearby riparian systems, including those associated with the Napa River, reducing their effectiveness in supporting ecosystem health and natural stormwater functions that benefit school communities.

Precipitation, Storms & Flooding

Climate projections indicate that precipitation is likely to occur in fewer but more intense storm events. These high-intensity storms, often associated with atmospheric rivers, can increase the risk of localized flooding and drainage system exceedance at school facilities throughout Napa County, particularly those located along the valley floor within Napa Valley Unified School District.

Heavy rainfall over short durations can lead to ponding in school parking lots, play areas, and access roads, as well as increased stress on stormwater infrastructure. When intense storms follow extended dry periods, soils may be less able to absorb water, increasing runoff and the potential for localized erosion or minor slope instability, particularly in hillside areas. Flooding and debris may also affect school access routes and surrounding transportation corridors, impacting student transportation, site access, and emergency response.

Wildfire & Vegetation Change

Rising temperatures and prolonged dry conditions are expected to increase wildfire risk across Napa County, affecting NCOE-supported facilities, particularly those located near wildland–urban interface areas in districts such as Calistoga Joint Unified, St. Helena Unified, and Pope Valley Union Elementary. While many school sites are located in developed areas, they are often adjacent to open space, agricultural lands, and natural vegetation that may be susceptible to wildfire.

Wildfire events in surrounding areas can impact schools through smoke exposure, degraded air quality, and potential evacuations or operational disruptions. Changes in vegetation patterns, including increased plant stress and shifts in species composition, may contribute to higher fuel loads over time. Even in the absence of direct fire impacts, regional wildfire smoke can significantly affect school operations and student health, particularly for sensitive populations.

Cascading Effects

Climate change increases the likelihood of cascading and compounding impacts across multiple hazards affecting NCOE and its partner school districts. Extreme heat can intensify drought conditions and elevate wildfire risk, while drought-stressed soils may be more vulnerable to erosion during heavy rainfall events. Severe storms may impact infrastructure already stressed by age or environmental conditions, and flooding can disrupt transportation networks and utility systems critical to school operations.

These interconnected risks highlight the importance of integrating climate considerations into educational facility planning, infrastructure improvements, and emergency preparedness efforts across all districts served by NCOE. Proactive, coordinated, and adaptive strategies will be essential to maintaining safe learning environments and ensuring continuity of operations as climate conditions continue to evolve.

9.5.3 Climate Change Impacts & Vulnerable Populations

Climate change is expected to exacerbate many of the natural hazards affecting Napa County, increasing risks to populations that already face social, economic, or physical vulnerabilities. Rising temperatures, more extreme precipitation events, prolonged drought, sea level rise, and increased frequency of extreme heat are projected to intensify existing hazard conditions and create new challenges for public health, safety, and emergency response.

Certain populations in Napa County are more likely to experience disproportionate impacts from climate-related hazards. Older adults, individuals with disabilities, low-income households, renters, and households with limited English proficiency may have reduced capacity to prepare for, respond to, and recover from climate-driven events. These groups may face barriers related to mobility, access to transportation, financial resources, housing stability, or timely access to emergency information.

Extreme heat presents a growing risk to vulnerable populations, particularly elderly residents, individuals with underlying health conditions, outdoor workers, and households without adequate cooling. Heat waves can increase the incidence of heat-related illness, strain electrical systems, and worsen air quality, especially when combined with wildfire smoke. Low-income households may be less able to afford cooling costs or make energy-efficient upgrades, increasing exposure during prolonged heat events.

Flooding and sea level rise disproportionately affect residents and workers in low-lying areas near the Napa River and bayfront. Vulnerable populations living or working in these areas may face greater risk of displacement, property damage, and disruption of access to essential services. Flood events can also impact transportation routes and utilities, creating additional challenges for individuals who rely on public transit, medical equipment, or nearby services.

Drought and water scarcity can place added burdens on vulnerable populations by increasing utility costs, limiting access to cooling and landscaping, and reducing the resilience of natural systems that provide flood protection and cooling benefits. For low-income households and fixed-income seniors, increased water and energy costs associated with drought and heat can compound financial stress.

Climate change may also increase the frequency and duration of poor air quality events, particularly from regional wildfires. Individuals with respiratory conditions, older adults, children, and outdoor workers are especially sensitive to smoke exposure. Limited access to air filtration, clean indoor environments, or protective equipment can further increase health risks for vulnerable populations.

9.5.4 Hazard Problem Statements

As part of the mitigation action identification process, the Planning Committee for each jurisdiction identified areas of concern (aka problem statements) for their respective facilities based on the risk assessment and vulnerability analysis, utilizing the RAMP mapping and static snapshot maps. Problem statements focused on the impact, victim, or threat that the hazard could create in the jurisdiction, as described in Table 9-15. Identifying common issues and weaknesses through these problem statements assisted the planning group in understanding the realm of resources needed for mitigation.

The goal is to have at least one mitigation action for every problem statement. Projects or actions have been developed to mitigate each problem identified. See Table 9-17 for a full list of mitigation actions and corresponding problem statements that they address. Each problem statement is coded with a problem number for cross-referencing between Table 9-15 and Table 9-17

Table 9-15: NCOE Hazard Problem Statements

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-AH-NCOE-362	All Hazard	Threat	**Napa County Office of Education**	Emergency Operations Plans (EOPs) and evacuation procedures across some campuses in NCOE's sphere of influence are outdated or incomplete, reducing preparedness during wildfire, flood, or earthquake events.	ma-AH-NCOE-238, ma-AH-NCOE-242
ps-CC-NCOE-368	Climate Change	Threat	**Napa County Office of Education**	Campuses within the NCOE's sphere of influence face increased exposure to climate-driven hazards such as extreme heat, severe weather, flooding, drought, and wildfire.	ma-AH-NCOE-238, ma-AH-NCOE-242, ma-DR-NCOE-28, ma-WF-NCOE-124, ma-WF-NCOE-234, ma-WF-NCOE-235, ma-SW-NCOE-241, ma-SW-NCOE-240, ma-HH-NCOE-239, ma-FL-NCOE-237, ma-AH-NCOE-236
ps-DR-NCOE-44	Drought	Impact	**Napa County Office of Education**	There may not be adequate water for restrooms, drinking, landscape maintenance, and general operations in schools under the NCOE's sphere of influence and its own facilities during extended drought events when rationing and use limits are imposed.	ma-DR-NCo-24, ma-DR-NCOE-28, ma-AH-NCOE-242

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-DR-NCOE-361	Drought	Impact	**Napa County Office of Education**	Schools within NCOE's sphere of influence lack a graywater or water reuse strategy, leaving campuses reliant on potable supplies even for non-critical functions, creating operational inefficiencies during water shortages.	ma-DR-NCOE-28
ps-EQ-NCOE-75	Earthquake	Threat	**Napa County Office of Education**	Several Napa LEA facilities and schools, including those on the AB 300 list, are located in severe seismic hazard zones and lack structural retrofits, increasing risk to life safety and continuity of operations.	ma-EQ-NCOE-40
ps-EQ-NCOE-359	Earthquake	Threat	**Napa County Office of Education**	Many campuses throughout the County lack backup systems for communications, fire suppression, or utilities. In the event of a major earthquake, these gaps may delay emergency response, evacuation coordination, and safe reunification with families.	ma-AH-NCOE-236, ma-EQ-NCOE-40
ps-EQ-NCOE-360	Earthquake	Impact	**Napa County Office of Education**	Earthquake damage to local access roads or bridges may impede school site access by staff, buses, and emergency responders, affecting shelter-in-place plans and post-event operations.	ma-AH-NCOE-238, ma-AH-NCOE-242, ma-EQ-NCOE-40
ps-FL-NCOE-363	Flood	Threat	**Napa County Office of Education**	Several campuses in NCOE's sphere of influence are vulnerable to recurring flood impacts due to outdated stormwater systems, undersized culverts, and low-lying building pads that do not meet modern drainage standards.	ma-FL-NCOE-237, ma-SW-NCOE-240
ps-FL-NCOE-364	Flood	Impact	**Napa County Office of Education**	Flooding at affected campuses has resulted in classroom water intrusion, mold outbreaks, and temporary closures, disrupting instruction and creating long-term repair and health-related costs.	ma-AH-NCOE-242, ma-FL-NCOE-237, ma-SW-NCOE-240
ps-HH-NCOE-367	High Heat	Victim	**Napa County Office of Education**	Many Napa LEA sites lack sufficient cooling, ventilation, or shaded outdoor areas to protect student and staff health during high-heat events.	ma-AH-NCOE-242, ma-HH-NCOE-239, ma-WF-NCOE-234
ps-HH-NCOE-369	High Heat	Impact	**Napa County Office of Education**	Extreme heat events often trigger power outages from high demand during peak hours that can affect continuity of educational operations on campuses without sufficient back-ups.	ma-AH-NCOE-236
ps-SW-NCOE-365	Severe Weather	Impact	**Napa County Office of Education**	High wind and heavy rain events have caused roof damage, downed trees, power outages, and blocked access to campuses, resulting in temporary closures and hazardous conditions.	ma-AH-NCOE-236, ma-FL-NCOE-237, ma-SW-NCOE-240, ma-SW-NCOE-241

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-SW-NCOE-366	Severe Weather	Threat	**Napa County Office of Education**	Campuses across the county lack reliable weather monitoring tools and storm-preparedness protocols. This limits the ability of facilities and operations teams to prepare for and respond to high wind and heavy rain storm events that may result in early dismissals, transportation delays, or emergency closures.	ma-AH-NCOE-238, ma-AH-NCOE-242, ma-FL-NCOE-237, ma-SW-NCOE-240, ma-SW-NCOE-241
ps-WF-NCOE-178	Wildfire	Threat	**Napa County Office of Education**	Multiple Napa Local Education Agency (LEA) campuses are located in moderate to high wildfire intensity zones, facing threats from smoke exposure, evacuation delays, and operational disruption due to PSPS events.	ma-WF-NCo-94, ma-WF-NCOE-124, ma-AH-NCOE-236, ma-AH-NCOE-238, ma-AH-NCOE-242, ma-HH-NCOE-239, ma-WF-NCOE-234, ma-WF-NCOE-235
ps-WF-NCOE-357	Wildfire	Victim	**Napa County Office of Education**	Students and staff at multiple campuses face respiratory risks from smoke during wildfire events, with limited access to indoor air purification systems.	ma-HH-NCOE-239, ma-WF-NCOE-234, ma-WF-NCOE-235
ps-WF-NCOE-358	Wildfire	Impact	**Napa County Office of Education**	Some Napa LEA campuses lack backup power systems, leaving schools without lighting, refrigeration, or communication capacity during PSPS events.	ma-AH-NCOE-236, ma-WF-NCOE-124, ma-WF-NCOE-235

9.6 Mitigation Strategy

This section provides the framework for how the Napa County Office of Education will reduce hazard risk within its jurisdiction while supporting the broader goals of the Napa County MJHMP. It includes an overview of existing capabilities, opportunities to strengthen resilience, and the county's prioritized mitigation actions. Together, these elements demonstrate how the Napa County Office of Education integrates hazard awareness into its planning and development processes while contributing to a coordinated countywide approach.

Within the Napa County MJHMP, the mitigation strategy serves as the roadmap for future hazard mitigation efforts. For the Napa County Office of Education, the strategy outlined in this annex reflects the outcomes of the countywide planning process while also addressing the county's unique risks, priorities, and community needs. The strategy is designed to reduce vulnerabilities identified in the risk assessment, including the problem statements developed for flooding, earthquakes, slope failure, wildfire, drought, severe storms, extreme heat, and climate change.

Mitigation actions identified in this annex include both policy-based and project-based initiatives, with an emphasis on integrating resilience into land use planning, infrastructure investments, and community programs. Actions are structured to align with FEMA's requirements and to coordinate with existing city, county, and regional planning mechanisms. Each action identifies responsible parties, potential funding sources, and the resources needed for implementation.

For the Napa County Office of Education, this strategy provides a framework for strengthening resilience by combining office-led initiatives, such as community preparedness, with regional coordination through the MJHMP. By advancing these efforts in local planning documents, the Napa County Office of Education enhances its ability to reduce hazard risk while supporting long-term community safety, sustainability, and economic stability.

The subsections that follow describe these elements in detail:

- **Sections 9.6.1, Capabilities and Opportunities,** provides a summary of NCOE's capacity to address natural hazards.
- **Section 9.6.2, Mitigation Action Plan,** presents NCOE's prioritized actions to guide implementation in coordination with countywide strategies.
- **Section 9.6.3, Status of Previous Mitigation Actions,** provides a summary of all previous actions and their current status, whether completed, cancelled, or revised.

Aligning the Action Plan

This section connects the Napa County Office of Education's mitigation actions with its existing capabilities and areas for growth. Capability assessments are a required element of hazard mitigation planning under the Disaster Mitigation Act of 2000 and FEMA's 2023 guidance, ensuring that actions are realistic, achievable, and aligned with available resources.

The section begins with a summary of the Napa County Office of Education's capabilities across four areas: planning and regulatory, administrative and technical, fiscal, and education and outreach. This overview highlights the tools and strengths that the district already uses to reduce hazard risk. The section then provides a detailed analysis of each capability area, identifying both current practices and opportunities to expand resilience.

9.6.1 Capabilities & Opportunities

This section provides a detailed assessment of NCOE's current capabilities to support hazard mitigation, as well as future opportunities. This consists of describing how NCOE is planning for hazards and growth and a summary of its existing capabilities and the potential for enhancement.

9.6.1.1 Planning for Hazards & Growth

The Napa County Office of Education (NCOE) manages program growth and service delivery within a decentralized framework that relies on coordination with local school districts, partner agencies, and third-party facility operators. Unlike a traditional campus-based institution, NCOE does not maintain a single, centralized site but instead operates across a network of administrative offices, alternative education programs, and specialized service locations distributed throughout Napa County. As a result, future development is generally limited to program expansion, reconfiguration of existing spaces, and strategic use of shared or leased facilities rather than large-scale new construction.

This distributed model places NCOE staff and students within a variety of built environments that may already be exposed to natural hazards such as flooding, earthquake ground shaking, wildfire, and extreme heat. Because many facilities are owned and maintained by partner districts or third parties, hazard exposure varies by site and is influenced by local geographic and environmental conditions. For example, some program locations may be situated in flood-prone areas near waterways, while others may be located in wildland-urban interface zones with elevated wildfire risk or in areas subject to strong seismic shaking.

To address these risks, NCOE integrates hazard awareness into program planning, interagency coordination, and operational procedures rather than direct control over facility design and construction. Risk reduction strategies emphasize collaboration with host agencies to ensure that facility safety features, emergency access, evacuation planning, and continuity of operations are aligned with local hazard conditions. Where NCOE has influence, program siting and operational decisions consider hazard exposure, accessibility, and the needs of vulnerable populations served.

Climate change is expected to increase the frequency and intensity of hazards affecting Napa County, including extreme heat, drought, wildfire, and severe storm events. These changes may disproportionately impact the populations served by NCOE, including students with access and functional needs, those experiencing housing instability, and other vulnerable groups. As such, NCOE prioritizes adaptive planning approaches that enhance resilience through coordination, flexible service delivery, and integration with broader county and district-level mitigation efforts.

Building Codes & Development Standards

Because NCOE facilities are often located within buildings owned or operated by school districts or other entities, responsibility for building design, construction, and code compliance typically rests with the facility owner. Most educational facilities in Napa County are regulated under the California Building Standards Code (Title 24) and overseen by the Division of the State Architect (DSA), which ensures compliance with structural safety, fire and life safety, and accessibility requirements for K–12 educational facilities.

NCOE coordinates with partner districts and agencies to ensure that the facilities it utilizes meet applicable safety standards and support the needs of its programs. This includes consideration of accessibility requirements, emergency systems, and life safety features appropriate for the populations served. While NCOE does not directly oversee construction, its collaboration with regulated entities ensures that facilities used for educational services are designed and maintained to withstand hazards such as earthquakes, fire, and extreme weather.

California Environmental Quality Act (CEQA) & Hazard Mitigation

Projects involving NCOE facilities or programs may be subject to the California Environmental Quality Act (CEQA), particularly when new sites are established, existing facilities are modified, or program expansions require discretionary approvals. In most cases, CEQA compliance is led by the facility owner or lead agency, with NCOE participating as a responsible or coordinating agency.

Through CEQA, potential impacts related to hazards—including flooding, seismic risk, wildfire exposure, and hazardous materials—are evaluated, and mitigation measures are incorporated where necessary. These measures may include site-specific design considerations, emergency access improvements, or operational protocols to reduce risk.

NCOE operates within a broader regulatory environment that includes state and federal hazard mitigation frameworks, such as the California Building Standards Code, the State Seismic Hazards Mapping Act, and FEMA floodplain management requirements. By coordinating with partner agencies and adhering to these regulatory processes, NCOE supports the integration of hazard mitigation into facility use and program planning.

9.6.1.2 Development & Hazard Considerations

Development and program expansion for NCOE occur within a complex environment shaped by shared facilities, jurisdictional coordination, and varying hazard exposures across the county. Because NCOE does not control most facility development, its approach focuses on integrating hazard considerations into site selection, program operations, and interagency planning.

Facilities used by NCOE may be located in areas subject to multiple hazards, including flood zones, seismically active regions, and wildfire-prone landscapes. Rather than directing physical development,

NCOE works with host agencies to ensure that hazard risks are understood and addressed through existing regulatory and planning frameworks.

Key considerations include:

- **Flooding:** Coordination with local jurisdictions to understand flood risk and ensure appropriate emergency planning and facility use.
- **Seismic Hazards:** Reliance on state-regulated building standards and DSA oversight for structural safety in educational facilities.
- **Wildfire and Extreme Heat:** Consideration of site access, defensible space (where applicable), and emergency response coordination in higher-risk areas.
- **Access and Transportation:** Evaluation of evacuation routes and access constraints, particularly for facilities serving vulnerable populations.

Through this collaborative and risk-informed approach, NCOE supports the safe delivery of educational services while recognizing the constraints and responsibilities associated with its distributed facility model.

9.6.1.3 Capabilities & Opportunities Assessment

To develop a realistic and actionable mitigation strategy, it must account for existing jurisdictional capabilities and what future opportunities there are to enhance those capabilities for purposes of hazard mitigation. This section provides an assessment of the Napa County Office of Education's existing capabilities and future opportunities, including planning and regulatory, administrative and technical, fiscal, and public outreach and education capabilities. This assessment also identifies opportunities to integrate this MJHMP into future planning, policies, or programs to weave mitigation efforts into daily operations and address hazard problems wholistically. Capabilities are categorized into four groups and include various mechanisms.

- **Planning and Regulatory Capabilities:** Existing long-range plans, emergency response plans, hazard-specific plans, land use policies, and building and development standards.
- **Administrative and Technical Capabilities:** Available expertise in emergency services, engineering, grant management, and community planning.
- **Fiscal Capabilities:** Budgetary capacity, taxing authority, grants, and other funding mechanisms that can support mitigation projects.
- **Outreach and Education Capabilities:** Existing programs for providing technical assistance, community education, public warnings, and stakeholder engagement.

A full description of the process used to develop the capabilities assessment is provided in Volume 1, Section 2.3.3.

This capabilities and opportunities assessment for the Napa County Office of Education lists the various types of capabilities along with how they have been, currently are, or will in the future be integrated into

hazard mitigation planning efforts. The three "HMP Integration" columns that identify the capability's status and usage are color-coded with green, yellow, or orange shading to communicate the following:

- **Status:** If the capability is present at all and what level of use it has generally.
- **Current Mitigation Use:** If the capability is currently being used in mitigation efforts, specifically, and at what level.
- **Future Opportunity:** If there is a future opportunity to integrate the capability into mitigation efforts and at what level.

Summary of Capabilities & Opportunities

This Capabilities and Opportunities Assessment for the NCOE summarizes the various types of capabilities it has for hazard mitigation currently. The assessment also identifies opportunities to integrate, expand, and improve NCOE's capabilities for future hazard mitigation. Table 9-16 provides a comprehensive list of capabilities and identifies the current status, current mitigation use, and future opportunities.

Planning & Regulatory

The Napa County Office of Education is a countywide agency that provides very specific education and supervision services. The Office of Education does not directly regulate development or land use activities. It also does not indirectly regulate development or land use activities through natural resource management or provision of utilities.

Administrative & Technical

The Napa County Office of Education is a countywide agency that provides very specific education and supervision services. The Office of Education does not directly regulate development or land use activities. It also does not indirectly regulate development or land use activities through natural resource management or provision of utilities.

While the office does not have dedicated staff for public outreach, GIS, or grant management, these functions are addressed through shared responsibilities across departments and through coordination with regional partners such as Napa County, which provides GIS support. This shared staffing approach effectively supports current mitigation activities but represents an opportunity for enhancement as hazard mitigation, climate adaptation, and grant funding efforts expand.

Warning Systems & Services

The Napa County Office of Education has a webpage devoted to emergency preparedness with links to wildfire, emergency evacuation, air quality, and public safety power shutoffs. The Office of Education utilizes the Alert Napa County emergency notification system as its primary platform for disseminating time-sensitive warnings related to natural hazards, evacuations, sheltering, and public safety incidents.

Emergency information is also communicated through partner social media channels, which provide rapid updates and situational awareness during evolving incidents. This multi-channel approach helps ensure redundancy and increases the likelihood that critical information reaches residents with varying access to technology or communication needs. Warning systems support response to a range of hazards, including flooding, wildfire, earthquakes, extreme weather, and power shutoff events.

Fiscal

The Napa County Office of Education has moderate to strong fiscal capacity to support hazard mitigation through a combination of local revenues, fees, grants, and long-term financing tools. These funding mechanisms support infrastructure maintenance, capital improvements, and implementation of hazard mitigation measures identified in plans and programs.

Education & Outreach

The Napa County Office of Education has strong education and outreach capabilities that support public awareness, preparedness, and risk reduction for natural hazards. The office maintains a dedicated emergency preparedness webpage, which centralizes information on alerts, evacuations, flooding, wildfire, earthquakes, power shutoffs, and other hazards. This resource serves as the primary hub for hazard-related public information.

The Office of Education actively uses its own website and social media platforms, including Facebook, Flickr, Instagram, LinkedIn, Nextdoor, X, and YouTube, to disseminate emergency information, preparedness messaging, and real-time updates during incidents. These digital tools are complemented by participation in annual public safety and preparedness events.

ASSESSMENT LEGEND

HMP Integration

Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Table 9-16: NCOE Capabilities and Opportunities Assessment

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Planning and Regulatory Capabilities				
Hazard Reduction Programs (Annually Conducted)				
Capital Improvements Program (CIP) or Plan				No formal CIP framework; only strategic capital priorities noted in Strategic Plan.
Annual Fire Prevention Plan				Fire drills conducted and integrated into safety plans; lacks a dedicated structural fire prevention plan.
Seismic Safety Program (Non-structural)				Yearly earthquake drills and facility safety inspections are implemented; could formalize structured program.
Earthquake Modernization Plan (Building Safety)				Evidence of building inspections and seismic drills; opportunity to formalize retrofit standards.
Stormwater Management Program (Annual Inspections)	N/A	N/A	N/A	Not applicable—no reference to facility-level stormwater infrastructure. Handled by each individual school district.
Hazard Plans and Programs				
Floodplain Response Plan				No standalone flood response plan identified. Response is likely folded into county-wide planning or school site protocols.
Community Wildfire Protection Plan (CWPP)				NCOE participates in planning efforts aligned with the county CWPP and MJHMP.
Ground Water Management Planning / Plans	N/A	N/A	N/A	Outside NCOE's operational scope. Not applicable to education agency responsibilities.
Climate Action Plan				No formal CAP, but EOP and strategic goals mention climate resilience. Room for growth through coordinated county planning.
Drought Mgmt/ Contingency Plan				School facilities coordinate with municipal utilities. No dedicated drought contingency plan found.
FireWise Communities within District				No indication of FireWise designation for any school site. Could be a future goal
Hazard-Related Public Outreach Program				Public-facing alerts, school safety messaging, and bilingual wildfire/air quality resources are regularly provided.
Administrative and Technical				

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Staff Capacity				
Emergency Manager				NCOE does not appear to have a dedicated emergency manager, but some responsibilities handled by facilities/admin.
Civil Engineer				Not present within NCOE. Engineering handled by external consultants or public works agencies.
Dedicated Public Outreach Personnel				Public communications are active and bilingual, but not focused specifically on mitigation outreach.
GIS Specialist and Capability				No in-house GIS capability noted. Would likely rely on County GIS or consultant support
Grant Manager, Writer, or Specialist				NCOE has been successful in applying for grants (e.g.NCOE HMP update) but lacks dedicated listed personnel
Other	N/A	N/A	N/A	
Warning Systems/Services				
General				Not within scope or purpose, but NCOE coordinates with Napa County OES and schools participate in general alerts (e.g., Nixle, Everbridge). Not standalone system.
Flood				County OES alert system
Wildfire				Air quality and wildfire information is shared regularly; partial integration with school emergency protocols.
Geological Hazards				County OES alert system
Fiscal Capabilities				
Financial Resources for Hazard Mitigation				
Levy for Specific Purposes with Voter Approval				School districts (not NCOE) can seek parcel taxes or bond measures with voter approval, though infrequently pursued for mitigation.
Utilities Fees	N/A	N/A	N/A	Not applicable to NCOE operations; does not operate utilities or collect such fees.
System Development Fee	N/A	N/A	N/A	Not relevant for education institutions; not imposed by NCOE.
General Obligation Bonds to Incur Debt				School Districts may issue bonds, but not NCOE directly

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Special Tax Bonds to Incur Debt				No evidence of use; likely handled through districts or the county rather than NCOE directly.
Withheld Spending in Hazard-Prone Areas				While not formalized, NCOE planning takes location hazards into account for facility investment decisions.
Stormwater Service Fees	N/A	N/A	N/A	Not applicable—stormwater utilities are handled by local public works or city agencies.
Capital Improvement Project Funding				Some limited access through deferred maintenance and facility improvements funding via State or County.
Education / Outreach Capabilities				
Education/Outreach Resources				
Website Dedicated to Hazard Topics				NCOE's site lacks a dedicated hazard webpage. Some information may be included under general safety or facilities topics.
Dedicated Social Media				Facebook, Instagram, Twitter
Hazard Info. Avail. at Library/ Planning Desk	N/A	N/A	N/A	Not applicable to NCOE. Hazard materials more often shared through digital or school-specific platforms.
Annual Public Safety Events				Some districts under NCOE umbrella participate in drills (e.g., Great ShakeOut); could be expanded.
Ability to Field Public Tech. Assistance Requests				No public-facing tech request portal related to hazard topics.
Public Safety Newsletters or Printed Outreach				Varies by program and school site; potential to develop consistent hazard communication across NCOE.
Fire Safe Councils				Not led by NCOE but could coordinate with Napa County FSC for school/community outreach.
Resource Conservation Districts				Potential partner for watershed, drought, and fire resilience education.
Other	N/A	N/A	N/A	

9.6.2 Napa County Office of Education Mitigation Action Plan

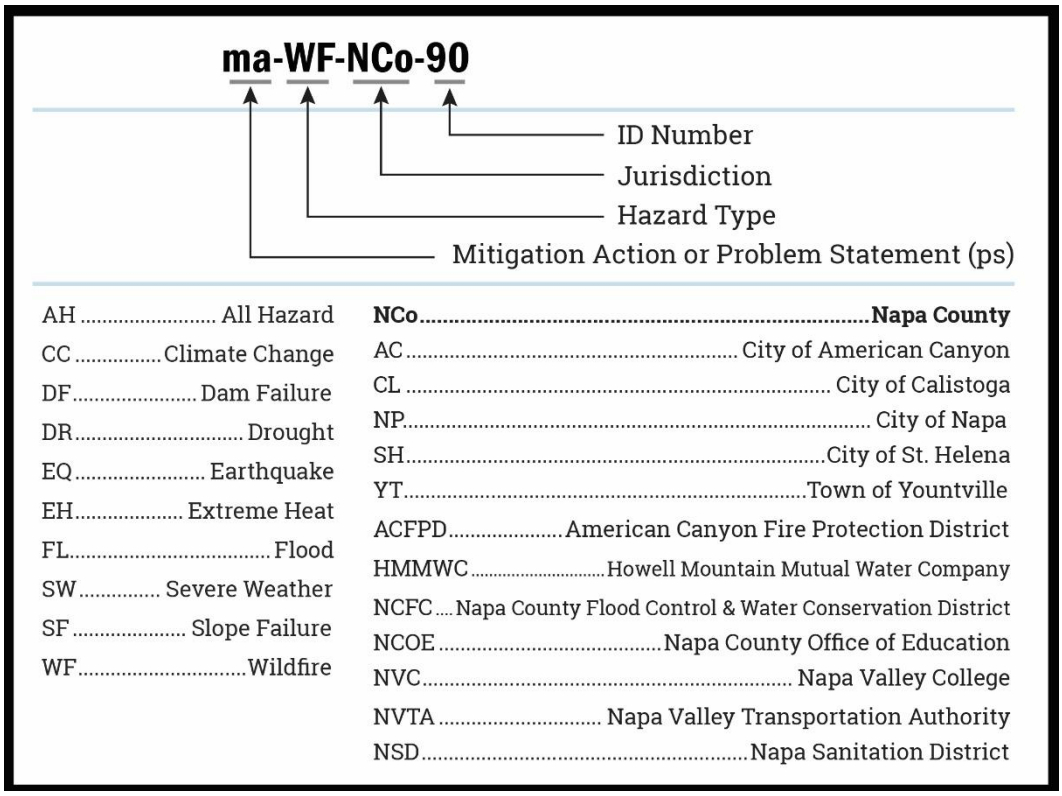


Figure 9-8: Mitigation Action Number Key

The Napa County Office of Education's mitigation actions were developed through a collaborative process informed by the updated risk assessment, local priorities, and extensive stakeholder engagement. As part of this 2026 MJHMP update, the office reviewed mitigation actions from its prior Local Hazard Mitigation Plan to determine which actions to carry forward, which to consolidate, and where entirely new strategies were required. This careful evaluation ensured that the updated action plan builds upon past commitments while also responding to current risks and future challenges.

The plan addresses the Napa County Office of Education's most significant hazards, including wildfire, earthquake, flood, slope failure, drought, dam failure, and extreme weather. Each mitigation action is designed to align with FEMA's hazard mitigation guidance and the requirements of the Disaster Mitigation Act of 2000. Where appropriate, overlapping or redundant actions were consolidated into broader, more comprehensive strategies that improve clarity, increase feasibility, and strengthen regional coordination.

The mitigation action prioritization method used by all participating jurisdictions is described in Volume 1, Section 4. Each action specific to the Napa County Office of Education is documented in Table 9-17, which identifies the responsible department, implementation timeframe, potential funding sources, and resources required to complete the action. Each action is also assigned a unique alphanumeric identifier (see Figure 9-8) that links the strategy to its associated hazard and supports consistent monitoring and reporting.

The Napa County Office of Education's approach recognizes that some hazards are most effectively addressed through regional efforts. Flood protection, drought resilience, and wildfire risk reduction often extend beyond the jurisdiction's boundaries and require collaboration with county, regional, and state partners. By aligning local actions with regional strategies, the Napa County Office of Education helps to

consolidate resources, maximize funding opportunities, and ensure that mitigation projects achieve the greatest benefit for San Pablo Bay, the Napa Valley, and the wider Napa County community.

Collectively, these mitigation actions provide a roadmap for reducing hazard risk, protecting vulnerable populations, and strengthening the long-term resilience of the Napa County Office of Education.

Table 9-17: NCOE Mitigation Action Plan

Mitigation No.	Hazard Type	Sub-Hazard	Mitigation Type	Year	Primary Agency	Title	Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Problem Statements
ma-AH-NCOE-236	All Hazard		PPRO - Property Protection , ES - Emergency Services , SP - Structural Projects	2026	Napa County Office of Education	Backup Power & Energy Resilience	Install backup generators, battery storage, or other power redundancy systems at critical campuses in high-risk wildfire and PSPS zones to ensure power continuity for lighting, refrigeration, and air filtration.	Facilities/Grounds Maintenance	High	High	1-3 Years	Project	HMGP / BRIC , General Fund	High	ps-EQ-NCOE-359, ps-EH-NCOE-369, ps-SW-NCOE-365, ps-WF-NCOE-178, ps-WF-NCOE-358, ps-CC-NCOE-368
ma-AH-NCOE-238	All Hazard		PRV - Prevention	2026	Napa County Office of Education	Emergency Operations Plan (EOP) Modernization	Revise and standardize all school EOPs to include protocols for wildfire, earthquake, flood, and extended power outage scenarios, with annual drills.	Administration	Medium	Medium	3-5 Years	Capacity / Capability Building	HMGP / BRIC , General Fund	High	ps-AH-NCOE-362, ps-CC-NCOE-368, ps-EQ-NCOE-360, ps-SW-NCOE-366, ps-WF-NCOE-178
ma-AH-NCOE-242	All Hazard		PE&A - Public Education & Awareness	2026	Napa County Office of Education	Hazard Education & Awareness Program	Establish an education and outreach program focused on all-hazards risk awareness, preparedness, and prevention, including addressing evacuation and shelter-in-place procedures, and home mitigation opportunities and resources aimed at faculty, staff, students, and their households.	Administration	Low	Medium	1-3 Years	Capacity / Capability Building	HMGP / BRIC , General Fund	Medium	ps-AH-NCOE-362, ps-CC-NCOE-368, ps-DR-NCOE-44, ps-EQ-NCOE-360, ps-FL-NCOE-364, ps-EH-NCOE-367, ps-SW-NCOE-366, ps-WF-NCOE-178
ma-DR-NCOE-28	Drought		SP - Structural Projects	2020	Napa County Office of Education	Water Resiliency Upgrades	Retrofit water supply systems to improve storage, delivery, and reuse capacity during drought conditions, including exploration of graywater system integration.	Facilities/Grounds Maintenance	High	High	5-10 Years	Project	HMGP / BRIC , General Fund	High	ps-DR-NCOE-44, ps-DR-NCOE-361, ps-CC-NCOE-368
ma-EQ-NCOE-40	Earthquake		PPRO - Property Protection	2020	Napa County Office of Education	Seismic Retrofits for AB 300 & Priority Campuses	Retrofit / harden multiple COE facilities identified on the AB 300 list or in high-risk earthquake zones.	Facilities/Grounds Maintenance	High	High	5-10 Years	Project	HMGP / BRIC , General Fund	High	ps-EQ-NCOE-75, ps-EQ-NCOE-359, ps-EQ-NCOE-360
ma-EH-NCOE-239	Extreme Heat		PPRO - Property Protection , NRP - Natural Resource Protection , SP - Structural Projects	2026	Napa County Office of Education	Heat & Air Quality Adaptation Projects	Install HVAC upgrades, shade structures, and cooling systems for campuses vulnerable to extreme heat and poor air quality.	Facilities/Grounds Maintenance	High	High	5-10 Years	Project	HMGP / BRIC , General Fund	Medium	ps-EH-NCOE-367, ps-WF-NCOE-178, ps-WF-NCOE-357, ps-CC-NCOE-368
ma-FL-NCOE-237	Flood		PPRO - Property Protection , SP - Structural Projects	2026	Napa County Office of Education	Stormwater & Drainage Improvements	Work with campuses within Napa COE's sphere of influence to upgrade outdated drainage systems and flood-prone building pads to prevent classroom water intrusion, mold growth, and infrastructure damage.	Facilities/Grounds Maintenance	High	High	5-10 Years	Project	HMGP / BRIC , General Fund	Medium	ps-FL-NCOE-363, ps-FL-NCOE-364, ps-SW-NCOE-365, ps-SW-NCOE-366, ps-CC-NCOE-368
ma-SW-NCOE-240	Severe Weather		PPRO - Property Protection , NRP - Natural Resource Protection , SP - Structural Projects	2026	Napa County Office of Education	Weatherproofing for Storm Resilience	Work with campuses within Napa COE's sphere of influence to retrofit roofs, remove or trim hazardous trees, and upgrade infrastructure to reduce storm-related damage and maintain safe access.	Facilities/Grounds Maintenance	High	High	5-10 Years	Project	HMGP / BRIC , General Fund	Medium	ps-SW-NCOE-366, ps-SW-NCOE-365, ps-FL-NCOE-363, ps-FL-NCOE-364, ps-CC-NCOE-368
ma-SW-NCOE-241	Severe Weather		PRV - Prevention	2026	Napa County Office of Education	Transportation & Access Reliability	Develop contingency transportation plans for severe weather events to ensure students can access schools or services safely when roads are blocked or buses are unavailable.	Administration	Low	Medium	1-3 Years	Capacity / Capability Building	HMGP / BRIC , General Fund	Medium	ps-SW-NCOE-365, ps-SW-NCOE-366, ps-CC-NCOE-368

Mitigation No.	Hazard Type	Sub-Hazard	Mitigation Type	Year	Primary Agency	Title	Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Problem Statements
ma-WF-NCOE-124	Wildfire		NRP - Natural Resource Protection	2020	Napa County Office of Education	Defensible Space & Site Hardening	Expand defensible space creation and fuel reduction around all high-risk campuses. Integrate with evacuation readiness and power continuity.	Facilities/Grounds Maintenance	Medium	High	3-5 Years	Project	HMGP / BRIC , General Fund , CalFIRE	High	ps-WF-NCOE-178, ps-WF-NCOE-358, ps-CC-NCOE-368
ma-WF-NCOE-234	Wildfire		ES - Emergency Services , SP - Structural Projects	2026	Napa County Office of Education	Air Filtration & Classroom Protection	Install portable and built-in air purifiers in classrooms across smoke-prone campuses to reduce health risks during wildfire smoke events.	Facilities/Grounds Maintenance	Medium	Medium	1-3 Years	Capacity / Capability Building	HMGP / BRIC , General Fund	High	ps-CC-NCOE-368, ps-EH-NCOE-367, ps-WF-NCOE-357, ps-WF-NCOE-178
ma-WF-NCOE-235	Wildfire		PRV - Prevention , ES - Emergency Services	2026	Napa County Office of Education	Continuity Planning for WUI Campuses	Develop site continuity plans for campuses in WUI zones to address PSPS events, evacuation, and student relocation procedures.	Administration	Low	Medium	3-5 Years	Capacity / Capability Building	HMGP / BRIC , General Fund	Medium	ps-WF-NCOE-358, ps-WF-NCOE-357, ps-WF-NCOE-178, ps-CC-NCOE-368

9.6.3 Status of Previous Mitigation Actions

In 2020, NCOE adopted its previous FEMA-approved HMP. This 2026 MJHMP represents a comprehensive update from that previous plan, as discussed in Volume 1, Section 1.5. Table 9-18 provides status updates for all of the previous mitigation actions in the office's annex from 2020, from which many of the mitigation actions in Table 9-17 were sourced and revised.

Table 9-18: NCOE Status of Previous Mitigation Actions

Mitigation No.	Status	Year	Primary Agency	Title/Description
ma-DR-NCOE-28	Ongoing	2020	Napa County Office of Education	Water Resiliency Upgrades
ma-EQ-NCOE-40	Ongoing	2020	Napa County Office of Education	Seismic Retrofits for AB 300 and Priority Campuses
ma-WF-NCOE-124	Ongoing	2020	Napa County Office of Education	Defensible Space and Site Hardening

Napa County

Multi-Jurisdictional Hazard Mitigation Plan Update

2026

Section 10. Napa Valley College

VOLUME 2
JURISDICTIONAL ANNEXES

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Napa County

2026 Multi-Jurisdictional Hazard Mitigation Plan Update

Napa Valley College (NVC)

Special Agency Annex

Section 10. Napa Valley College 10-8

10.1 Scope & Purpose 10-8

10.2 Jurisdictional Setting 10-8

10.2.1 Geography & Climate 10-10

10.2.2 Campus Building Inventory & Lifelines 10-12

10.2.3 Student Body & Staff 10-15

10.2.4 Dependent & Disabled Populations 10-16

10.2.5 Regional Income & Housing Demographics 10-17

10.2.6 Housing 10-19

10.2.7 Race, Ethnicity & Language 10-20

10.2.8 Growth Trends & Future Development 10-21

10.3 Planning Process 10-22

10.3.1 Public Input & Draft Review 10-24

10.4 What's New 10-25

10.4.1 Mitigation Activities 10-25

10.4.2 Mitigation Successes 10-26

10.5 Risk Assessment 10-27

10.5.1 Hazard Screening & Prioritization 10-27

10.5.2 Vulnerability to Specific Hazards 10-31

10.5.3 Climate Change Impacts & Vulnerable Populations 10-55

10.5.4 Hazard Problem Statements 10-56

10.6 Mitigation Strategy 10-58

10.6.1 Capabilities & Opportunities 10-59

10.6.2 Napa Valley College Mitigation Action Plan 10-70

10.6.3 Status of Previous Mitigation Actions 10-74

List of Figures

Figure 10-1: Napa Valley College Geographic Overview Map....10-11
Figure 10-2: Napa Valley College Parcels and Buildings....10-14
Figure 10-3: Napa Valley College Student Enrollment Numbers....10-15
Figure 10-4: Napa Valley College Staff Occupational Categories....10-16
Figure 10-5: Napa Valley College Average Award Discount by Income....10-18
Figure 10-6: Barrels and Shelving Collapsed in Classroom from Earthquake....10-26
Figure 10-7: Napa Valley College Risk Assessment Matrix....10-29
Figure 10-8: Napa Valley College Wildfire Risk (Main Campus)....10-33
Figure 10-9: Napa Valley College Wildfire Risk (St. Helena Campus)....10-34
Figure 10-10: Napa Valley College Earthquake Risk (M6.7 West Napa) (Main Campus)....10-37
Figure 10-11: Napa Valley College Earthquake Risk (M6.7 West Napa) (St. Helena Campus)....10-38
Figure 10-12: Napa Valley College Earthquake Risk (M7.1 Hunting Creek Berryessa) (Main Campus)....10-39
Figure 10-13: Napa Valley College Earthquake Risk (M7.1 Hunting Creek Berryessa) (St. Helena Campus).. 10-40
Figure 10-14: Napa Valley College Liquefaction Risk (Main Campus)....10-41
Figure 10-15: Napa Valley College Liquefaction Risk (St. Helena Campus)....10-42
Figure 10-16: Napa Valley College Flood Risk (Main Campus)....10-45
Figure 10-17: Napa Valley College Flood Risk (St. Helena Campus)....10-46
Figure 10-18: Drought Severity Timeline 2000-2025....10-49
Figure 10-19: Mitigation Action Number Key....10-70

List of Tables

Table 10-1: Napa Valley College Planning Team and Steering Group Members....10-22
Table 10-2: Napa Valley College Planning Team Meetings....10-24
Table 10-3: Napa Valley College Document Review of Potential Hazards....10-28
Table 10-4: Napa Valley College Hazards Prioritization Summary....10-30
Table 10-5: Napa Valley College Wildfire Exposure....10-32
Table 10-6: Napa Valley College Earthquake Exposure (M6.7 West Napa)....10-36
Table 10-7: Napa Valley College Earthquake Exposure (M7.1 Hunting Creek Berryessa)....10-36
Table 10-8: Napa Valley College Flood Exposure....10-44
Table 10-9: Drought Classifications and Impacts....10-48
Table 10-10: Cal-Adapt Extreme Heat Terms and Thresholds....10-52
Table 10-11: Napa Valley College Hazard Problem Statements....10-56
Table 10-12: Napa Valley College Capabilities and Opportunities Assessment....10-65
Table 10-13: Napa Valley College Mitigation Action Plan....10-72
Table 10-14: Napa Valley College Status of Previous Mitigation Actions....10-74

Adoption Resolution

To comply with the Federal Disaster Mitigation Act of 2000 (DMA 2000), Napa Valley College has officially adopted this 2026 Napa County Multi-Jurisdictional Hazard Mitigation Plan, including Volume 1 in its entirety as well as this Volume 2 municipal annex. The adoption of the MJHMP recognizes the agency's commitment to reducing the impacts of natural hazards within its jurisdiction and across Napa County.

A copy of the agency's adoption record is provided on the following pages. Adoption records for all jurisdictions are summarized in Volume 1, Table ES-1.

ADOPTION RECORD TO BE INSERTED UPON COMPLETION.

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Section 10. Napa Valley College

10.1 Scope & Purpose

This Jurisdictional Annex for the Napa Valley College of the 2026 Napa County Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) details the hazard mitigation planning elements specific to the agency's planning area. The annex is not intended to be a standalone document but appends to and supplements the information contained in the umbrella plan document (Volume 1). This annex provides additional information specific to the city, with a focus on hazard identification and risk assessment, vulnerability assessment, problem statements, mitigation strategy, and capabilities assessment. Below are the Napa Valley College Points of Contact:

Primary Point of Contact	Alternate Point of Contact
Amber Wade, Chief of Police Napa Valley College 2277 Napa Vallejo Hwy, Napa, 94558 Telephone: (707) 256-7000 email: awade@napavalley.edu	Facilities Director Napa Valley College 2277 Napa Vallejo Hwy, Napa, 94558 Telephone: (707) 256-7000 email: miguel.vargas@napavalley.edu

10.2 Jurisdictional Setting

Napa Valley College (NVC) is a public community college serving Napa County and the surrounding region as part of the California Community Colleges system. The College provides academic, career technical, and community education programs to a diverse student population, as well as workforce training and lifelong learning opportunities. In addition to its educational mission, NVC serves as a community resource and gathering place, which increases its importance in emergency preparedness, response, and recovery activities.

NVC is governed by an elected Board of Trustees and operates under the administrative leadership of a Superintendent/President. The College is subject to oversight and regulatory requirements established by the California Community Colleges Chancellor's Office and applicable State of California laws, including building, safety, and accessibility standards. Unlike cities or counties, NVC does not have land use authority beyond its campuses; development and capital improvements are guided by state requirements, internal facilities planning documents, and voter approved bond programs.

The main campus is located at 2277 Napa Vallejo Highway in the City of Napa, situated along the Napa Valley floor in proximity to the Napa River and local tributaries. In addition to the main campus, Napa Valley College operates an educational center in the City of St. Helena, extending services to the northern portion of Napa County. The St. Helena Campus supports instructional programs and community access to higher education, with its own set of facilities, infrastructure, and localized hazard considerations.

Additional educational services and programs may occur at satellite or partner locations throughout Napa County; however, the College does not own or maintain all facilities where it has a presence. As such, NVC's role in emergency preparedness and hazard mitigation at off site locations may be limited or coordinated with the host jurisdiction or property owner.

The College serves a substantial daytime and, increasingly, residential population that includes students, faculty, staff, and visitors. Napa Valley College supports approximately 6,000 to 6,500 students annually, with broader district service levels exceeding 10,000 full- and part-time students per semester. In addition, the College employs over 180 staff. Population levels fluctuate throughout the academic year and daily class schedules, and recent development of on-campus student housing has introduced a 24-hour residential population.

NVC operates a range of facilities including classrooms, laboratories, administrative buildings, student services, and support infrastructure such as utilities, parking areas, and stormwater systems. The campus includes both older structures constructed in earlier decades and newer facilities built to current State seismic and building standards. Recent capital investments, including student housing and instructional facilities, have expanded the College's physical footprint and increased the overall value and exposure of campus assets. Portions of the campus are located within areas subject to natural hazards, including flooding and dam inundation zones, as identified in this annex.

Because of its role as a critical educational institution and community resource, Napa Valley College must maintain continuity of operations and ensure the safety of its campus population during hazard events. The College maintains internal emergency management capabilities, including a campus police department, emergency notification systems, and coordination with Napa County Operational Area partners.

Key Characteristics:

- Jurisdiction Type: Public Community College (California Community Colleges System)
- Governance: Elected Board of Trustees; Superintendent/President leadership
- Primary Campus Location: 2277 Napa Vallejo Highway, Napa, CA
- Service Area: Napa County and surrounding region
- Population Served: ~6,000–6,500 students annually; >10,000 district-wide; ~180 staff (variable and partially residential population)
- Facilities: Academic, residential, administrative, and support infrastructure across campus
- Operational Role: Education provider, community resource, and potential emergency support and sheltering site

Planning Considerations:

- Large daytime population with fluctuating occupancy
- Presence of older and newer buildings with varying structural characteristics
- Some buildings within a floodplain and dam inundation area
- Dependence on transportation access and utility systems for continuity
- Coordination required with local and state agencies for emergency management

10.2.1 Geography & Climate

Napa Valley College is located in Napa County in the North Bay region of California, approximately 50 miles northeast of San Francisco. The College's service area encompasses all of Napa County, including the incorporated cities of American Canyon, Napa, St. Helena, and Calistoga, as well as unincorporated rural areas and agricultural lands throughout the Napa Valley. Figure 10-1 identifies Napa Valley College's location within Napa County. This area includes the Napa Valley floor, surrounding foothills and mountain ranges, and the Napa River watershed.

The main campus in the City of Napa is situated along the valley floor near the Napa River and its tributaries, in a relatively low-lying area with proximity to mapped flood hazard zones. The College also operates a campus in St. Helena, located in the northern Napa Valley, which is characterized by a narrower valley floor and proximity to hillside and wildland areas. These differing geographic settings expose College facilities to a range of natural hazards, including flooding, wildfire, and seismic activity.

The climate of Napa Valley College's service area is classified as Mediterranean, with hot, dry summers and cool, wet winters. Precipitation is highly seasonal, with the majority occurring between November and April, often associated with atmospheric river storm events that can produce intense rainfall over short durations. Average annual precipitation varies across the County, generally ranging from approximately 20 inches on the valley floor to over 40 inches in higher elevation areas. Summer temperatures frequently reach the 80s to 90s °F in inland valley areas, while winter temperatures are typically mild, with daytime highs in the 50s °F and cooler nighttime conditions. (U.S. Climate Data, 2020)

Climate variability in Napa County has increased in recent decades, with more frequent and intense extreme weather events, including atmospheric river storms, prolonged drought, and extreme heat. These conditions contribute to increased flood risk, wildfire potential, and stress on water supply and infrastructure systems. The Napa River watershed, which drains much of the County, is particularly sensitive to intense rainfall events that can generate rapid runoff, localized flooding, and downstream impacts in developed areas along the valley floor.

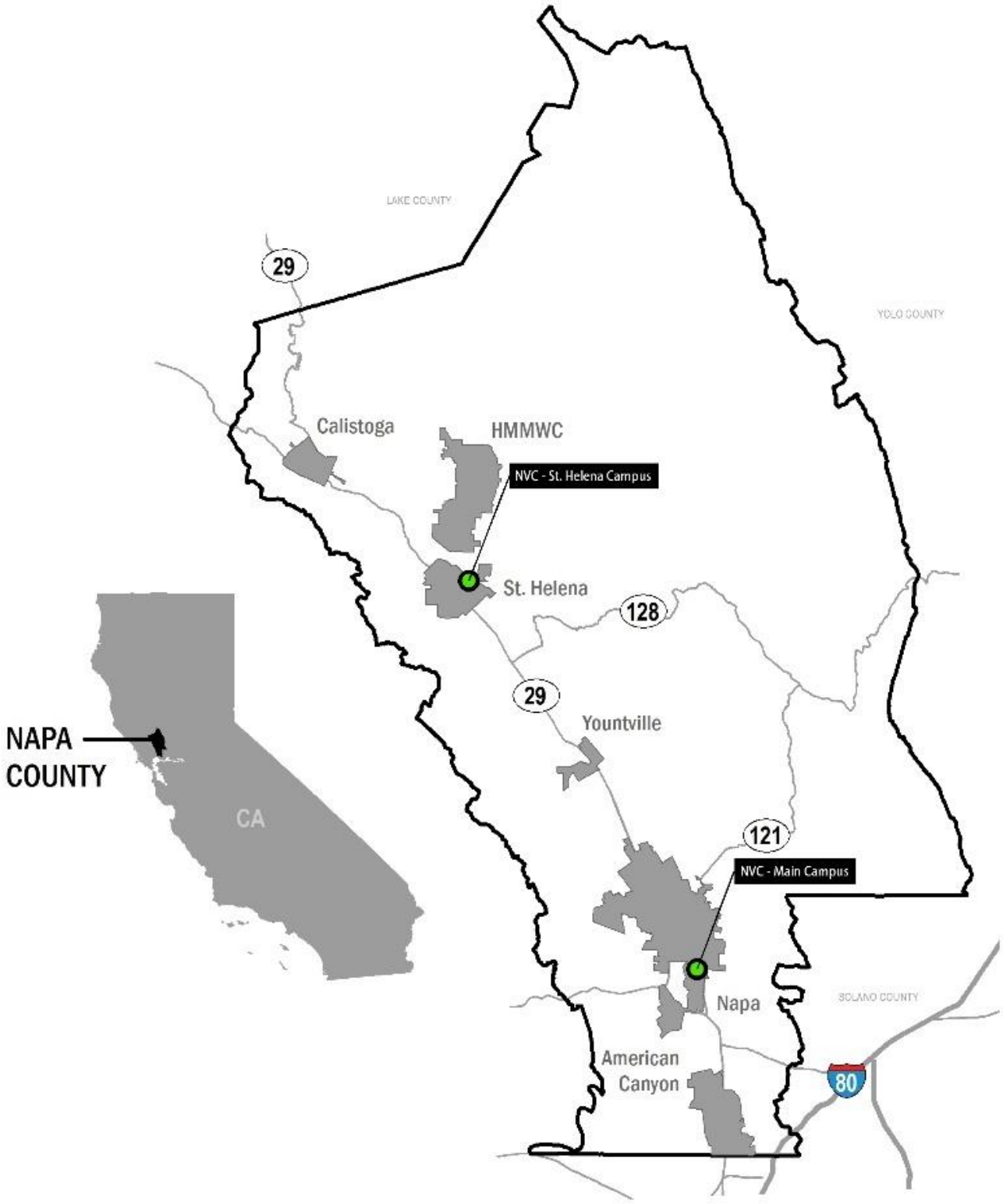


Figure 10-1: Napa Valley College Geographic Overview Map

10.2.2 Campus Building Inventory & Lifelines

Napa Valley College operates multiple educational facilities within Napa County, including its primary campus in the City of Napa and a secondary campus in St. Helena. The main Napa campus encompasses a large, developed footprint consisting of academic buildings, laboratories, administrative offices, student services, and support infrastructure, as well as recently constructed student housing facilities. The St. Helena Campus provides additional instructional space and community-serving functions in the northern portion of the County. Together, these campuses include a mix of older structures and newer buildings constructed to modern seismic and building standards. Both campuses are largely built-out, meaning that future development will primarily consist of renovation, modernization, and targeted expansion rather than large-scale new construction.

The College maintains detailed facility and infrastructure data to support planning and hazard mitigation, including building age, construction type, and critical system dependencies. This information supports vulnerability assessments and prioritization of mitigation actions. Figure X-X illustrates campus parcels and building footprints for Napa Valley College facilities.

Safety & Security

Law enforcement services for Napa Valley College are provided by the Napa Valley College Police Department, which maintains on-campus presence and coordinates closely with the Napa Police Department, Napa County Sheriff's Office, and other regional law enforcement agencies. The St. Helena Campus is supported by local law enforcement resources, including the St. Helena Police Department. This coordinated approach supports rapid response and integrated emergency management across College facilities.

Fire protection services are provided by local fire agencies, including Napa Fire Department for the main campus and St. Helena Fire Department for the northern campus. Fire stations are located in close proximity to both campuses, supporting timely emergency response. Campus facilities are equipped with fire suppression systems, alarms, and hydrant access to support firefighting operations and life safety.

Water

Water service to the Napa campus is provided by local municipal water systems, supported by on-site infrastructure including distribution lines, fire protection systems, and irrigation networks. The College maintains system mapping to allow for rapid isolation of water lines in the event of leaks or damage. Water supply reliability may be affected by drought conditions, infrastructure disruptions, or emergency events. Redundancy is limited to municipal system capacity and emergency response measures.

Health & Medical

The College provides basic health services on campus; however, advanced medical care is provided by nearby healthcare facilities, including hospitals and emergency medical service providers in Napa County.

During major hazard events, access to medical care may be impacted by roadway closures, utility outages, or increased regional demand for emergency services.

Energy (Power & Fuel)

Electrical power for Napa Valley College is provided by Pacific Gas and Electric Company. Portions of the campus are served by underground distribution, which reduces exposure to certain hazards; however, the College remains dependent on the regional electrical grid. Backup power capacity is limited and may not support full campus operations during extended outages, affecting continuity of operations.

Communications

The College relies on a combination of wired and wireless communication systems, including internet, phone networks, and emergency notification systems. These systems are integrated with local and regional emergency management networks. While primary systems are robust, communication capabilities may be degraded during large-scale disasters affecting regional infrastructure.

Transportation

Access to the Napa Valley College main campus is primarily provided via Napa Vallejo Highway and adjacent local roadways, which serve as critical routes for daily access, evacuation, and emergency response. The St. Helena Campus is accessed via State Route 29 and local road networks. These transportation corridors are vulnerable to flooding, wildfire, traffic congestion, and other disruptions that could limit access to and from campus during hazard events. Public transit services provide additional connectivity but may be interrupted during emergencies.

Hazardous Materials

Campus operations, including laboratory and instructional activities, involve the use and storage of limited quantities of hazardous materials. These materials are managed in accordance with applicable regulations and campus safety protocols, including proper storage, handling, and emergency response procedures. While risks are controlled, accidental releases during hazard events remain a potential concern requiring ongoing planning and coordination.

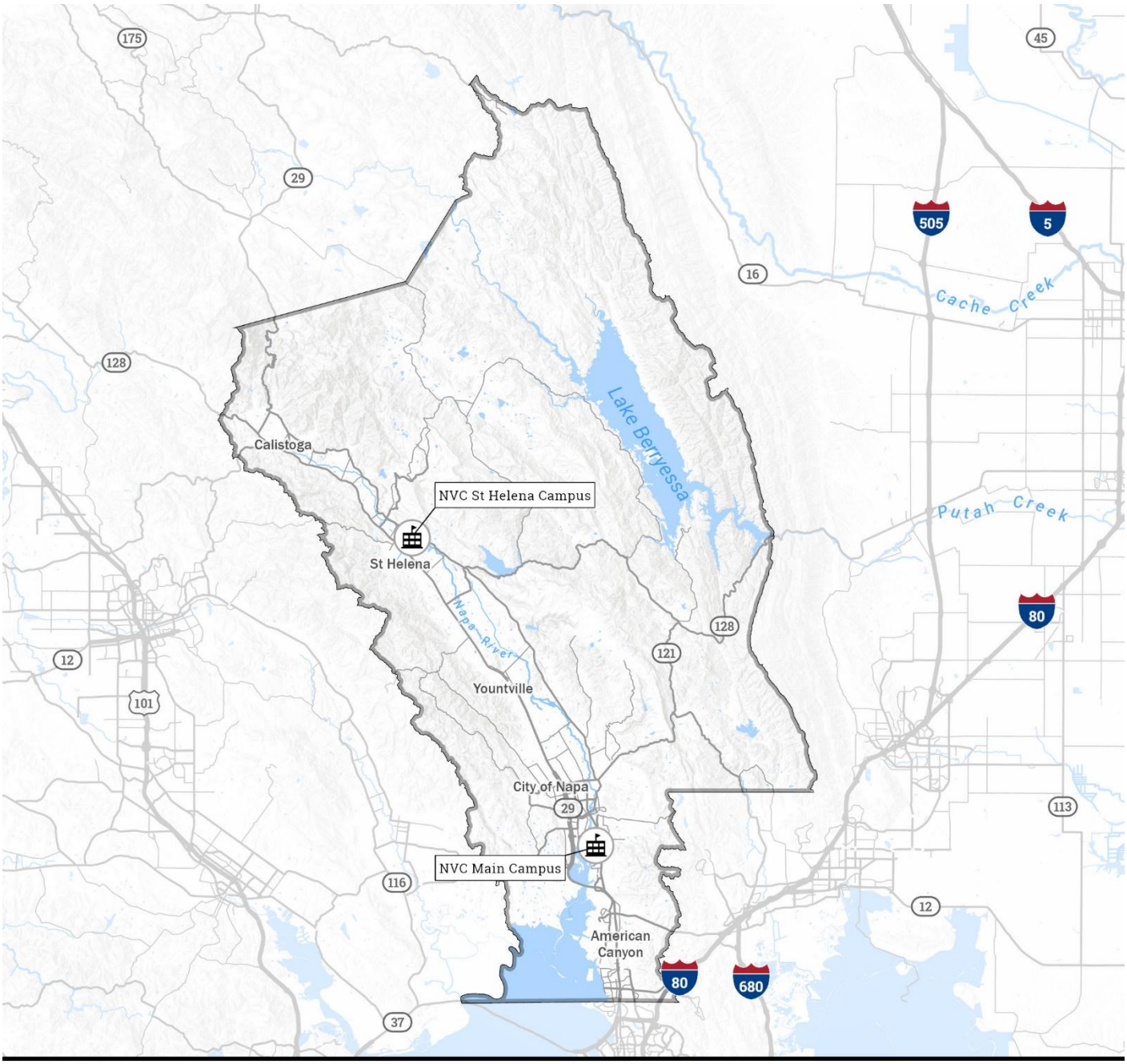


Figure 10-2: Napa Valley College Parcels and Buildings

10.2.3 Student Body & Staff

According to the U.S. Department of Education's Integrated Postsecondary Education Data System (IPEDS), Napa Valley College serves approximately 6,000 to 7,000 students annually, with a portion enrolled full-time and the remainder attending part-time. (Figure 10-3) The College maintains a student-to-faculty ratio of approximately 20:1 to 25:1, and employs several hundred faculty and staff across instructional, administrative, and support functions. (Figure 10-4) Enrollment levels fluctuate by academic term, with the highest attendance typically occurring during the fall and spring semesters, and lower but consistent enrollment during summer sessions.

Historically, enrollment at Napa Valley College has varied in response to regional demographics, economic conditions, and broader trends in community college attendance. While the College serves a smaller total population than larger regional institutions, it continues to provide critical educational services to Napa County residents and maintains a stable core student population. The combination of full-time and part-time enrollment contributes to a dynamic campus environment, with daily population levels varying significantly based on class schedules, program participation, and seasonal academic cycles.

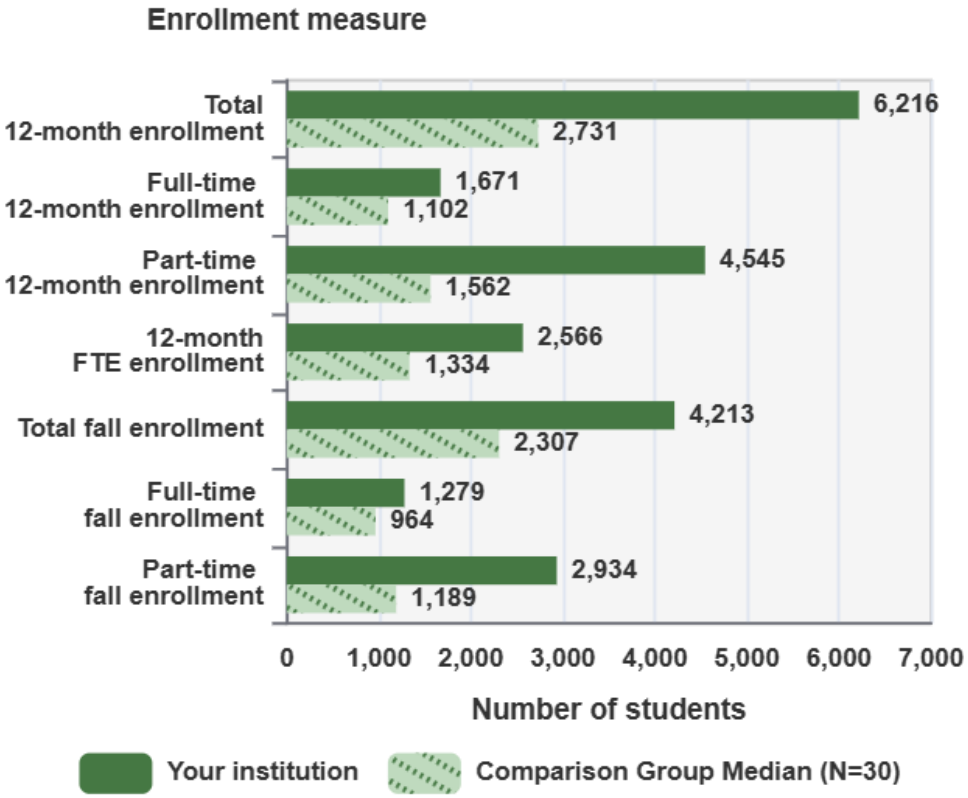


Figure 10-3: Napa Valley College Student Enrollment Numbers

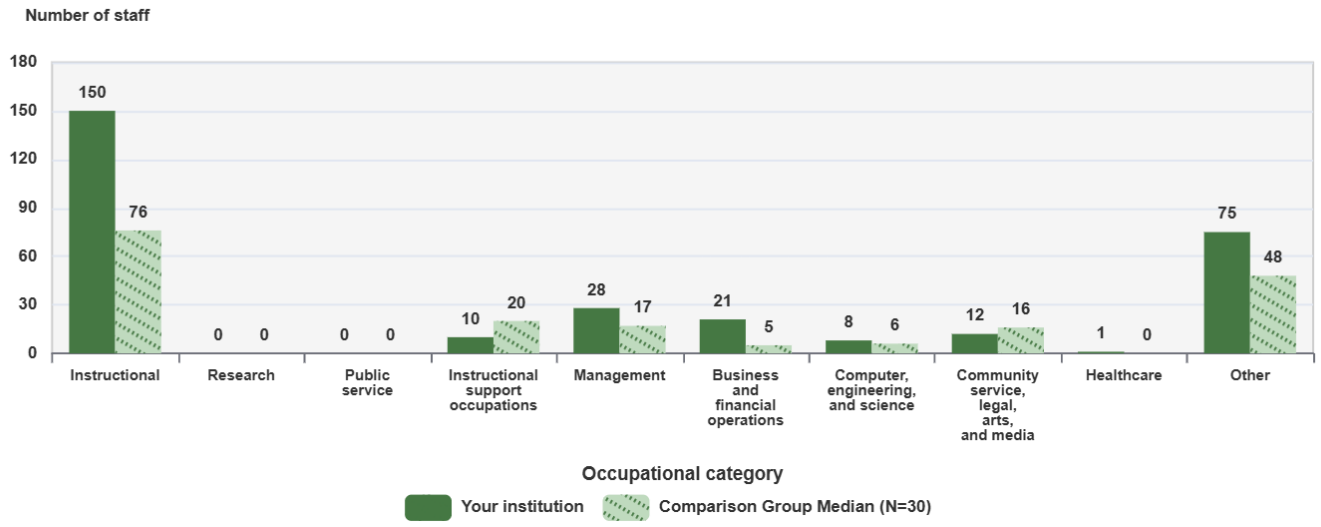


Figure 10-4: Napa Valley College Staff Occupational Categories

10.2.4 Dependent & Disabled Populations

This section describes the demographic characteristics of Napa Valley College to inform hazard mitigation planning and support risk reduction strategies. Natural hazards affect populations both physically and socially, and demographic composition plays a critical role in how impacts are experienced and distributed, particularly among populations that may face greater challenges in preparedness, response, and recovery. Understanding the social and economic characteristics of the campus population also helps assess potential impacts associated with damage to buildings, infrastructure, essential services, and transportation systems.

Evaluation of demographic data helps identify populations and campus subgroups that may be more vulnerable to hazard events. In the context of all hazards preparedness and response, at risk individuals, often referred to as vulnerable populations or individuals with access and functional needs, are defined federally as including children, older adults, pregnant women, and individuals who may require additional support during emergencies (42 U.S.C. § 2802(b)(4)(B)). This may include individuals who are economically disadvantaged, living with disabilities, dependent on caregivers, from historically underserved communities, have limited English proficiency, lack reliable transportation, are experiencing housing insecurity, or have chronic medical conditions.

At Napa Valley College, students, faculty, and staff may experience varying levels of vulnerability based on factors such as age, income, disability status, housing conditions, and commuting patterns. The College serves a diverse and partially transient population, including students who may travel from across the region or reside in on campus housing. These factors can influence the ability of individuals to receive emergency notifications, evacuate safely, or recover following a hazard event. Vulnerability is dynamic and

may vary depending on the type of hazard; for example, flooding that disrupts regional transportation networks may disproportionately affect commuting students and staff, while power outages may have greater impacts on residential populations and those with medical needs.

The Napa County Multi-Jurisdictional Hazard Mitigation Plan addresses many of these vulnerabilities at the community and regional level, while this Napa Valley College Annex focuses on conditions specific to the campus environment. Together, these efforts support the prioritization of mitigation actions that enhance life safety, maintain continuity of operations, and reduce disproportionate impacts on vulnerable populations.

Additional discussion of vulnerable populations, access and functional needs, and related considerations is provided in Volume 1, Section 1.5.3.6.

10.2.5 Regional Income & Housing Demographics

Low-income students and households connected to Napa Valley College face disproportionate financial burdens related to disaster preparedness, response, and recovery. Unexpected costs associated with hazard events can act as tipping points for students already managing tuition, housing, food insecurity, or the risk of displacement. Many students and their families are renters or live in shared housing, limiting their ability to invest in structural improvements or carry adequate insurance. As a result, those with the greatest exposure to hazard impacts are often the least equipped to absorb losses and recover quickly.

At Napa Valley College, this vulnerability extends beyond the classroom. Disruptions caused by hazard events such as flooding, wildfire, or power outages can affect students' ability to access housing, transportation, employment, and digital connectivity. These disruptions may force students to miss classes, delay coursework, or withdraw from their studies altogether. Given Napa County's history of wildfire events and periodic flooding, these risks are both immediate and recurring.

Addressing these challenges requires inclusive and equity-focused mitigation planning that improves access to preparedness resources, strengthens continuity of operations, and supports student retention during and after disasters. By integrating equity into hazard mitigation strategies, Napa Valley College can enhance resilience for its campus population while supporting the broader community it serves.

Student Economic Profile

Napa Valley College serves a student population with notable financial vulnerability, as reflected in the distribution of financial aid and award discount trends by income group. Figure 10-5 illustrates the average award discount by income range over time, with Napa Valley College shown in red relative to peer institutions. The average award discount represents the share of total educational costs offset by grants and scholarships.

The data indicate that students in the lowest income brackets receive the highest levels of financial support, with award discounts generally exceeding 25 percent and in some years approaching or exceeding 30 percent. For moderate-income groups, award discounts are lower but still substantial, while higher-income

groups receive comparatively limited financial assistance. In 2023, the College's award discount remains most pronounced among lower-income students, consistent with targeted financial aid policies that prioritize need-based assistance.

While Napa Valley College's award discount is generally comparable to peer institutions, it trends slightly lower in some income categories, particularly among middle-income groups. This suggests that although financial aid is widely distributed, there may still be gaps in affordability for certain student populations.

Overall, the distribution of financial aid reinforces that a significant portion of the student body relies on grant-based assistance to access higher education. This reliance indicates that many students meet federal and state definitions of low-income or financially vulnerable populations, which has direct implications for hazard preparedness and recovery. Students with limited financial resources are less likely to have savings, insurance, or flexible housing options, increasing their susceptibility to disruption during hazard events.

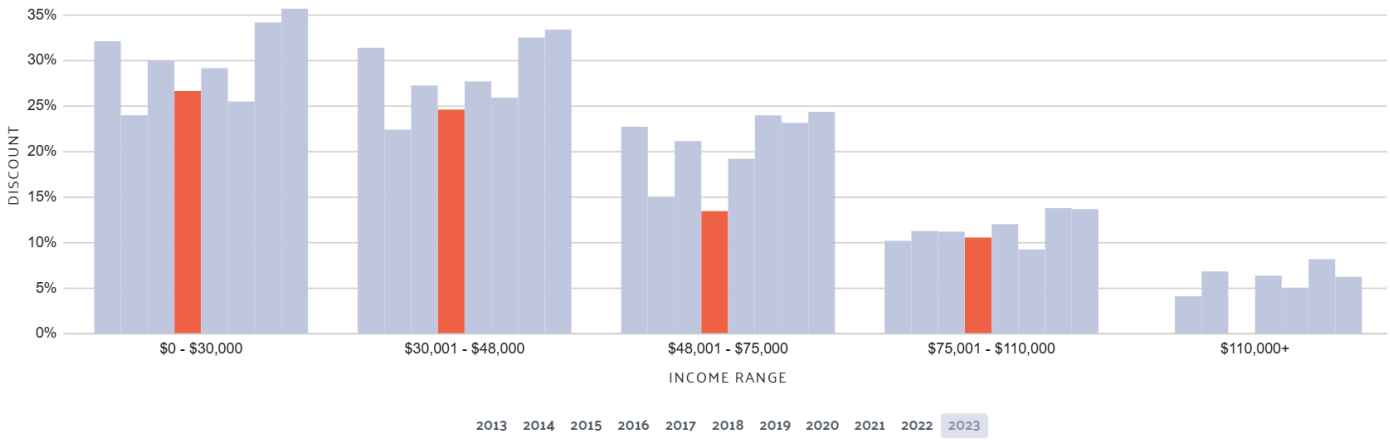


Figure 10-5: Napa Valley College Average Award Discount by Income

This reliance on grant-based assistance suggests that a substantial portion of Napa Valley College students meet federal and state definitions of low-income or financially vulnerable populations. While detailed household income data is limited, the distribution of financial aid and higher award discount levels among lower-income groups indicate that many students face ongoing economic constraints.

Pell Grant eligibility, a widely recognized indicator of low-income status, is prevalent among community college populations statewide and is reflected in the higher levels of financial support provided to students in the lowest income brackets. Nationally, Pell Grant recipients typically come from households earning less than $40,000 annually, and similar patterns are evident at Napa Valley College, where financial aid is concentrated among students with the greatest economic need.

Financial instability has direct implications for hazard preparedness and recovery. Students already balancing tuition, transportation, childcare, and housing costs are less likely to have financial reserves, insurance coverage, or flexible living arrangements. As a result, hazard events such as flooding, wildfire, or

power outages can quickly escalate into significant disruptions. Students who are renters, housing insecure, or supporting dependents are particularly vulnerable, as even short-term impacts may lead to displacement or interruption of their education.

For Napa Valley College, these conditions highlight that hazard events do not only affect physical infrastructure but also pose a risk to student retention and continuity of operations. Addressing these vulnerabilities through targeted outreach, resource coordination, and equitable mitigation strategies is essential to support both individual resilience and institutional stability.

10.2.6 Housing

Housing conditions are a key factor influencing vulnerability for the Napa Valley College population. While many community colleges rely entirely on off-campus housing, Napa Valley College now includes on-campus student housing through River Trail Village, which opened in 2024. This development provides furnished residential units, including dormitory-style housing and apartments designed to accommodate both individual students and student families. The addition of on-campus housing represents a significant enhancement to the College's ability to support student stability and continuity during hazard events.

Despite this advancement, a large portion of the student population continues to rely on the regional housing market within Napa County and surrounding jurisdictions. The local housing market is characterized by high costs, limited availability, and a substantial renter population. Many students live in shared housing, commute from neighboring communities, or reside in more affordable areas that may be more exposed to hazards such as flooding, wildfire, or limited infrastructure capacity. These conditions can increase vulnerability while also limiting the ability of residents to implement structural mitigation measures.

Students residing in River Trail Village benefit from newer construction built to current building and seismic standards, as well as proximity to campus services and emergency resources. However, concentrated residential populations on campus also introduce additional planning considerations, including evacuation, shelter-in-place capabilities, and continuity of essential services such as power, water, and communications during hazard events.

Housing insecurity remains a concern for portions of the student population. Some students may experience overcrowding, temporary living arrangements, or risk of displacement, all of which can be exacerbated during disasters. Hazard events that damage housing stock or disrupt utilities may result in prolonged displacement and interruptions to educational continuity, particularly for low-income students and those with limited financial resources.

In addition, the geographic distribution of off-campus housing creates reliance on regional transportation corridors such as State Route 29 and Silverado Trail. These routes are susceptible to flooding, wildfire impacts, and congestion during emergency events, which can limit access to campus and disrupt both response and recovery operations.

From a hazard mitigation perspective, Napa Valley College must address both on-campus and off-campus housing vulnerabilities. On-campus, this includes ensuring that River Trail Village is integrated into emergency planning, evacuation procedures, and backup utility strategies. Off-campus, mitigation efforts rely on coordination with local jurisdictions, housing providers, and community organizations. Public education, emergency notification systems, and partnerships to support temporary housing and recovery resources are essential components of a comprehensive approach.

Ensuring housing resilience is critical not only for life safety but also for maintaining continuity of operations and supporting student retention during and after hazard events.

10.2.7 Race, Ethnicity & Language

Natural disasters compound racial disparities; non-white individuals and communities receive less recovery aid from FEMA than their white counterparts, even where the amount of damage is the same. (Howell & Elliott, 2019) (National Advisory Council, 2020) These disparities are evidence of the complicated relationship between disaster recovery and overlapping social vulnerabilities including race, income, language, and health. Black and Latinx residents are more likely to be low income and renters, conditions which create barriers to navigating FEMA's Individual Assistance programs. Communities with more non-white residents may have lower tax revenue and property values, which means less investment in mitigation and rebuilding efforts before and after an emergency.

Napa Valley College serves a diverse student population that reflects both the demographics of Napa County and the broader regional workforce. In 2023, Hispanic or Latino students represented the largest share of enrollment at approximately 48.6%, followed by White students at 23.4% and Asian students at 12.9%. Additional groups include students identifying as Two or More Races at 5.6%, Black or African American at 4.0%, Native Hawaiian or Other Pacific Islander at approximately 0.5%, and American Indian or Alaska Native at approximately 0.3%. Approximately 4.6% of students did not report their race or ethnicity. Overall, more than 75% of the student population identifies as students of color, highlighting Napa Valley College's role as a majority-minority serving institution.

Compared to national averages for community colleges, Napa Valley College enrolls a higher proportion of Hispanic or Latino students and a lower proportion of White students, reflecting regional demographic patterns and the College's role in serving historically underrepresented populations. This diversity has important implications for hazard mitigation planning, particularly in ensuring that preparedness, response, and recovery strategies are culturally appropriate, accessible, and inclusive of individuals with limited English proficiency or other access and functional needs.

The College also serves a largely commuter and nontraditional student population, with many students balancing employment, family responsibilities, and academic commitments. A significant portion of students attend part-time, which can influence their availability during emergencies and their ability to receive timely notifications or access campus resources. These factors underscore the importance of

flexible communication strategies, multilingual outreach, and coordination with community partners to ensure effective hazard response and recovery.

10.2.8 Growth Trends & Future Development

Napa Valley College's physical development is guided by a long-range planning framework established in the Facilities Master Plan, which emphasizes strategic reinvestment in existing assets, modernization of aging facilities, and targeted expansion to support evolving educational programs. The main campus, encompassing approximately 141 acres with about 95 acres developed, retains a largely established footprint, with future development focused on optimizing land use, improving functionality, and enhancing resilience rather than large-scale outward expansion.

Consistent with this approach, capital improvements prioritize renovation, reconfiguration, and replacement of existing facilities to address deferred maintenance, meet current code requirements, and support instructional needs. The Facilities Master Plan identifies a series of modernization projects across multiple academic buildings (including Buildings 800, 1200, 1400, 1600, and 1800), which include upgrades to building systems, reconfiguration of classroom space, and improvements to instructional technology. These efforts are intended to enhance operational efficiency, increase flexibility of learning environments, and ensure compliance with current safety and accessibility standards.

In addition to modernization, the College has identified targeted new construction projects to address programmatic gaps and reduce reliance on temporary or modular facilities. Planned projects include development of new instructional buildings, expanded laboratory space for physical sciences and career technical education programs, and consolidation of student services into more functional and accessible configurations. These projects are designed to align with the Educational Master Plan and support projected enrollment and workforce training needs.

Facility planning at Napa Valley College also incorporates a lifecycle cost perspective through its Total Cost of Ownership (TCO) framework. This approach evaluates not only initial construction costs but also long-term operational, maintenance, and replacement costs associated with facilities. The TCO Assessment highlights the importance of proactive reinvestment, noting that aging infrastructure and deferred maintenance can significantly increase lifecycle costs and reduce system reliability if not addressed. The District currently maintains over 510,000 square feet of building space across its campuses, with ongoing needs for repair, replacement, and system upgrades to sustain safe and effective operations.

A key metric used in facility planning is the Facility Condition Index (FCI), which compares repair costs to replacement value to inform decisions on whether to rehabilitate or replace structures. Industry standards indicate that as facilities approach an FCI of 0.30, deterioration becomes noticeable, and at approximately 0.50, full replacement or major renovation becomes more cost-effective. This framework supports prioritization of capital investments and helps guide hazard mitigation strategies by identifying vulnerable or aging infrastructure.

Infrastructure systems—including water, sewer, stormwater, and energy—also represent critical components of campus development planning. Much of the existing underground utility infrastructure dates to earlier phases of campus construction and includes materials such as transite piping, which are susceptible to failure due to age, ground movement, and root intrusion. Additionally, portions of the campus, including athletic facilities, are located in lower-lying areas and are subject to periodic flooding during significant storm events. These conditions underscore the need for continued infrastructure upgrades and integration of hazard mitigation measures into capital improvement planning.

Overall, Napa Valley College's development strategy reflects a shift toward resilience-focused reinvestment, emphasizing modernization, lifecycle asset management, and targeted expansion. This approach is consistent with FEMA hazard mitigation planning principles, which prioritize reducing long-term risk through sustainable design, infrastructure reliability, and informed capital planning.

10.3 Planning Process

The Napa Valley College Jurisdictional Planning Team followed the planning process detailed in Volume 1, Section 2, including participating in the county-wide Hazard Mitigation Planning Team (HMPT) and formulating their own internal planning team to support the broader planning process.

The College's representatives assisted with stakeholder and public engagement efforts alongside the Consultant Team, with assistance from the county-wide HMPT and their internal planning team. This engagement process is described in Volume 1. Specifically, for the Napa Valley College, this included postings to the city website and social media, and outreach events, as documented in Appendix B. Examples of Key Stakeholders engaged by Napa County on behalf of the city with relevance to the development of College's mitigation strategy include the USDA and other federal agencies; CAL FIRE and other state agencies; other jurisdictions; community-based organizations such as local Chamber of Commerce chapters; utility providers like PG&E; UC Davis and other academia; and local businesses.

All Key Stakeholders that were invited to participate in the planning process are listed in Volume 1, Section 2, and the input received from stakeholders was integrated into the college's annex, as described in Volume 1 Table 2-9. The college's internal planning team participants, their positions, and how they participated in the planning process are shown in Table 10-1.

Table 10-1: Napa Valley College Planning Team and Steering Group Members

Team Members	Title	Description of Involvement
Amber Wade	Chief of Police	Lead Point-of-Contact, HMPT #1, and #3, BO #1 and #2
Miguel Vargas	Director of Facilities (former)	Kick-Off Meeting; Participating Stakeholder, BO #2
Samantha Maddox	Facilities Planning Manager	Participating Stakeholder, BO #2
Matt Christensen	Director of Facilities (former)	Participating Stakeholder
Brooke Jackson		Participating Stakeholder

The college participated in a comprehensive hazard mitigation planning process as part of the 2026 Napa County MJHMP update. This included a series of breakout meetings, listed in Table 10-2 that engaged the district's planning team, which included key city personnel and stakeholders in evaluating hazards, identifying local vulnerabilities, and prioritizing mitigation strategies.

The process began with a County-Wide Steering Group Kickoff Meeting on February 28, 2024. This initial meeting focused on welcoming participants, establishing a shared understanding of the project scope and schedule, clarifying roles and responsibilities of the Steering Group, the county-wide Hazard Mitigation Planning Team (HMPT), and individual jurisdictional planning teams, and included a review of key changes since the 2020 Local Hazard Mitigation Plan The meeting set the foundation for coordinated participation throughout the planning effort.

On December 10, 2025, participants engaged in a hexagon mapping activity designed to visually identify mitigation actions that could benefit from or require inter-jurisdictional coordination. These collaborative efforts helped shape a refined set of mitigation alternatives, establish shared planning goals, and align local strategies with FEMA's Hazard Mitigation Assistance (HMA) funding framework.

Throughout the series of breakout meetings, the Napa Valley College engaged in a structured and collaborative planning process focused on assessing hazard risks, identifying vulnerabilities, and developing targeted mitigation strategies. The meetings began with recaps of the county-wide HMPT meetings to ensure alignment of goals and progress.

During the August 30, 2024, breakout out meeting, discussions concentrated on community engagement outcomes, initial risk assessments, and the integration of demographic data to better understand vulnerable populations. Jurisdictional teams reviewed their specific hazard exposures using the Risk Assessment Mapping Platform (RAMP) and participated in prioritization exercises to identify their top hazards.

The August 18, 2025, breakout meeting shifted toward reviewing local capabilities and defining specific areas of concern, which informed the drafting of problem statements. Teams worked collaboratively to refine mitigation alternatives, align actions with FEMA guidelines, and develop a shortlist of priority mitigation actions and inter-jurisdictional collaboration opportunities.

The meetings also included consensus-building activities around hazard rankings, capabilities, and planned actions, while providing regular updates on the overall project schedule.

Table 10-2: Napa Valley College Planning Team Meetings

Meeting & Date	Agenda / Topics	Goals / Key Inputs
County-Wide Steering Group and HMPT Kick-off and Meetings #1 & #2 February 28, 2024– July 18, 2024		
Napa Valley College Planning Team Breakout Meeting #1 August 28, 2024	▪ County-wide HMPT meetings #1 and #2 recaps ▪ Community engagement progress and results ▪ Risk assessment and community vulnerability ▪ Demographics and vulnerable populations ▪ Overview of jurisdiction-specific hazard risks and exposure ▪ Introduction to Risk Assessment Mapping Platform (RAMP) ▪ Jurisdiction-specific hazard risk ranking exercise ▪ Project schedule updates and next steps	▪ Consensus on jurisdiction-specific priority hazards ▪ Identify capabilities and potential mitigation actions ▪ Community engagement volunteers
County-Wide HMPT Meeting #3 March 25, 2025		
Napa Valley College Planning Team Breakout Meeting #2 August 19, 2025	▪ Breakout Meeting #1 and HMPT #3 recaps ▪ Review capabilities assessment ▪ Review areas of concern and define problem statements ▪ Principles of effective mitigation strategies and actions, and mitigation alternatives ▪ Refine and align jurisdiction-specific mitigation actions exercise ▪ Project schedule updates and next steps	▪ Consensus on jurisdiction-specific capabilities ▪ Consensus on jurisdiction-specific areas of concern ▪ Consensus on priority mitigation actions and collaboration opportunities ▪ Community engagement volunteers
County-Wide HMPT Meeting #4 December 10, 2025		

10.3.1 Public Input & Draft Review

As detailed in Volume 1, Section 2, the draft plan was available for public review and comment from May 15 to June 2, 2026. Public comments received during that time were similar to those gathered throughout the public engagement process, including the need for more equity in the distribution of mitigation activities and funding and the need for enhanced cooperation among jurisdictions, utility providers, and state agencies. These comments were incorporated into the college's mitigation strategy, as appropriate; although, most were already addressed by the Mitigation Action Plan which was based on previous public input.

Public and stakeholder input was gathered and incorporated throughout the plan development process, before the public review period, such as from the online public survey (see Volume 1, Section 2.1.2 and Appendix B, for details). During the review period, jurisdictional staff and stakeholders that participated in

the plan development also reviewed the public draft and provided comments on minor corrections and revisions, which were addressed in the final plan.

10.4 What's New

This section summarizes hazard mitigation planning efforts within the planning area and identifies updates incorporated into the 2026 Multi-Jurisdictional Hazard Mitigation Plan (MJHMP). Napa Valley College previously participated in prior county MJHMP updates and has also maintained internal planning efforts to guide resilience and risk reduction at the facility and building level. As part of the 2026 update, the College continues its participation in the countywide MJHMP, further integrating its planning efforts within a coordinated regional framework.

This continued participation reflects the College's commitment to collaborative resilience planning and recognizes that many hazards, including flooding, severe storms, and earthquakes, transcend jurisdictional boundaries. Through the MJHMP process, Napa Valley College has identified its priority hazards, developed hazard-specific problem statements, and advanced actionable mitigation strategies to reduce risk.

By aligning with Napa County and regional partners and leveraging shared resources, the College strengthens its capacity to prepare for, respond to, and recover from hazard events while ensuring continuity of operations and protecting the campus community.

10.4.1 Mitigation Activities

The college has successfully implemented several initiatives aimed at addressing identified vulnerabilities. Some of these accomplishments are highlighted in this section and have directly contributed to reducing risks from hazards such as flooding, all hazards, and severe weather. These completed projects showcase the college's ability to effectively plan, fund, and execute measures that protect its residents and infrastructure.

In addition, the college has systematically reviewed and adjusted its mitigation actions, exemplifying adherence to FEMA's Planning Policy Guide principles and emphasizing the importance of dynamic and adaptive mitigation planning. By fostering partnerships, leveraging funding opportunities, and prioritizing equity in implementation, the college aligns with best practices to build resilience against natural disasters. This ongoing effort is a testament to the college's commitment to the principles of risk-informed decision-making, equitable resource allocation, and integration with broader regional and state hazard mitigation objectives.

Adjustments to Previous Mitigation Actions

A significant portion of the office's mitigation efforts remain ongoing or in the pipeline. These actions, ranging from infrastructure upgrades to community outreach initiatives, represent the college's proactive approach to addressing hazards as resources become available.

Recognizing constraints such as limited funding, staffing, and shifting priorities, the college has reevaluated certain initiatives, leading to their reprioritization or canceling of mitigation actions. Factors such as feasibility, cost-effectiveness, and emerging risks informed these decisions, ensuring alignment with the college's updated hazard mitigation goals. Adjustments to previous mitigation actions are documented as part of the colleges action plan Table 10-13, and more specific status updates are provided in Table 10-14.

10.4.2 Mitigation Successes

Napa Valley College has taken a proactive and locally driven approach to hazard mitigation, implementing a variety of projects that enhance campus resilience without reliance on FEMA grant funding. Through strategic capital improvements, facility upgrades, and partnerships with technical experts, the College has advanced meaningful risk reduction measures that address its most pressing hazards, particularly earthquakes, flooding, and infrastructure vulnerabilities.

These efforts reflect the College's ability to integrate mitigation into routine planning, maintenance, and capital investment decisions. By leveraging institutional resources, state funding programs, and internal expertise, Napa Valley College has demonstrated that effective mitigation can be achieved through sustained commitment and thoughtful planning. The following success stories highlight innovative and impactful actions that have strengthened the safety, reliability, and long-term resilience of campus facilities and operations.

Seismic Safety Improvements

Napa Valley College has taken significant steps to reduce earthquake risk through the implementation of seismic retrofits and structural upgrades across key campus facilities. Following the 2014 South Napa earthquake, the College conducted detailed structural assessments and prioritized improvements to older buildings that did not meet current seismic standards. Working with IDA Structural Engineers, the College implemented targeted retrofits to strengthen building systems, improve resistance to seismic forces, and address structural deficiencies.

These upgrades reduced the likelihood of structural and nonstructural damage during future earthquakes, enhancing life safety for students, faculty, and staff. In addition, the improvements support continuity of operations by protecting critical educational facilities and infrastructure. This effort demonstrates Napa Valley College's commitment to proactive mitigation and long-term resilience in a seismically active region.



Figure 10-6: Barrels and Shelving Collapsed in Classroom from Earthquake

10.5 Risk Assessment

This section focuses on profiling hazards specific to the college and assessing vulnerability independent of the broader county-wide planning area, which has been evaluated in Section 3 of Volume 1. The hazard profiles in Volume 1 discuss overall impacts to the planning area and describe relevant plans, policies, and regulations; past events; location; frequency and probability of future occurrences; severity and extent; warning time; secondary hazards; and climate change impacts. For more information on risk assessment methodologies, see Volume 1, Appendix A.

This section includes a tailored vulnerability assessment, analyzing assets at risk such as population, property, and critical facilities and infrastructure unique to the city, and information on city-specific differences in hazard vulnerability across the planning area. It also identifies total city assets at risk, including people, property, and critical facilities and infrastructure within the city. In addition, this section presents growth and development trends for the community, offering insights into vulnerabilities and risks that represent the broader context of assets at risk.

10.5.1 Hazard Screening & Prioritization

Members of the County-Wide Planning Team came together to collaboratively decide which county-wide hazards would be included in the MJHMP, and which would be excluded. Hazard screening and prioritization took place early in the process and integrated historic data, local knowledge, and consensus opinions to create a risk assessment matrix for the county as well as for each participating jurisdiction. These matrices indicate the priority of hazards prior to further refinement. Details about this process, the results of the discussion, and in-depth profiles for county-wide hazards can be found in Volume 1, Sections 2 and 3.

The college's internal planning group used the same hazard identification and prioritization process as the county-wide Planning Team. The college's planning team members reviewed previously prepared hazard mitigation plans and other relevant documents to determine the realm of natural hazards that have the potential to affect the college. Table 10-3 provides a crosswalk of hazards identified in select planning documents, including the 2020 Napa County MJHMP and the 2023 State of California HMP. The crosswalk was used to develop a preliminary hazards list, providing a framework for the group to evaluate which hazards were truly relevant to the college and which ones were not.

The internal planning group then ranked hazards based on their probability of affecting the college and potential impacts on the college assets. Figure 10-7 displays the results of the hazard risk ranking exercise that was performed before further refinement. All hazards have been profiled in Volume 1 of this document. The purpose of this annex is to specifically address the college's vulnerability to specifically identified hazards.

Table 10-3: Napa Valley College Document Review of Potential Hazards

Hazard	2020 Napa County MJHMP	Emergency Operations Plan	2023 California SHMP
Agricultural Pests	■		■
Avalanche			■
Climate Change	■	■	■
Coastal			■
Dam Failure	■		■
Drought	■	■	■
Earthquake / Liquefaction	■	■	■
Extreme Cold			■
Extreme Heat		■	■
Extreme Weather / Storms	■	■	■
Flood	■	■	■
Geologic / Mass Movement	■	■	■
Human-Caused			■
Insects			■
Levee Failure			■
Pandemic Disease	■		■
Sea Level Rise			■
Soil			■
Subsidence			■
Tornado			■
Tsunami / Seiche Wave			■
Volcano			■
Wildfire	■	■	■

Risk Assessment Matrix Definitions

PROBABILITY RATING

The likelihood of a hazard event occurring within a time period?

PROBABILITY

- **Highly Likely** - 100% annual probability. Or Likely to occur every year in your lifetime.
- **Likely** - between 10 & 100% annual probability. Or will occur several times in your lifetime.
- **Possible** - between 1 & 10% annual probability. Or Likely to occur some time in your lifetime.
- **Unlikely** - less than 1% annual probability. Or unlikely but possible to occur in your lifetime.

To concentrate resources, the jurisdictional planning team will focus on "High" and "Extreme" risk hazards, and "Medium" risk hazards to a lesser extent. These hazards have the higher probability and greater impact as it relates to the jurisdictions planning area.

Hazard definitions are included in **Vol. 1** of this plan. Some hazards are discussed as subset hazards— e.g., "Levee Failure" within the "Flood" hazard profile. If a hazard is not present on the risk matrix, is grey, or categorized as a "Low" risk hazard, the jurisdictional planning team felt the hazard had a minimal footprint or impact within their planning area and chose not to profile the hazard.

Hazard Information / Legend:



Climate Change impacts will be addressed within each relevant hazard section within the plan update and as a stand alone section for each jurisdiction. Climate change may change the frequency, duration, or intensity of other hazards profiled.

IMPACT RATING

In terms of injuries, damage, or death, would you anticipate impacts to be minor, limited, critical, or catastrophic when a significant hazard event occurs? The impact could be in terms of one hazard event (flooding from a culvert failure) or a large-scale event (multiple rivers flooding) in the same jurisdictional boundary.

IMPACT

Minor	Limited	Critical	Catastrophic

Minor - very few injuries, if any. Only minor property damage & minimal disruption on quality of life. Temporary shutdown of critical facilities.

Limited - minor injuries only. Approx. 10% or less of property in disaster footprint damaged or destroyed. Complete shutdown of critical facilities for more than one day.

Critical - multiple deaths/injuries possible. Between 25% and 50% of property in disaster footprint is damaged or destroyed. Complete shutdown of critical facilities for more than one week.

Catastrophic - high number of deaths/injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for 30 days or more.

Napa Valley College Risk Matrix

IMPACT

PROBABILITY

	Minor	Limited	Critical	Catastrophic
Highly Likely	Medium	High	Extreme	Extreme
Likely	Medium (DROUGHT)	High (SEVERE WEATHER)	High	Extreme
Possible	Low	High (WILDFIRE, FLOOD)	High	High (EARTHQUAKE)
Unlikely	Low	Low	Medium	Medium

Figure 10-7: Napa Valley College Risk Assessment Matrix

Note: Hazard naming in the Risk Assessment Matrix may not match the final naming used. Refer to hazards prioritization summary table.

Priority Hazards

The results of the initial risk ranking exercise completed by the college's Planning Team, before further refinement, are identified in the county's completed matrix in Figure 10-7. Table 10-4 provides the final list of priority hazards and subhazards with additional details about why certain hazards were chosen and why others were not prioritized. However, it should be noted that many hazards not prioritized for profiling are briefly discussed as secondary or compounding hazards, and subhazards that were profiled and included in the risk assessment are listed specifically.

Table 10-4: Napa Valley College Hazards Prioritization Summary

Hazard	Priority	Explanation
Earthquake / Liquefaction	**High**	**Profiled in Volume 1, Section 3.3.4, and Section 10.5.2.2 in this annex, including Liquefaction**
Wildfire	**Medium**	**Profiled in Volume 1, Section 3.3.1, and Section 10.5.2.1 in this annex**
Flood	**Medium**	**Profiled in Volume 1, Section 3.3.2, and Section 10.5.2.3 in this annex**
Levee Failure	-	Profiled in Volume 1, Section 3.3.2; not a priority due to low probability and impact potential
Extreme Weather / Storms	**High**	**Profiled in Volume 1, Section 3.3.5, and Section 10.5.2.5 in this annex as Severe Weather, including High Wind and Heavy Rain** (Winter Weather not a priority due to low probability and impact potential)
Drought	**Medium**	**Profiled in Volume 1, Section 3.3.6, and Section 10.5.2.4 in this annex**
Geologic / Mass Movement	-	Profiled in Volume 1, Section 3.3.5; not a priority due to low probability and impact potential
Extreme Heat	**Medium**	**Profiled in Volume 1, Section 3.3.8, and Section 10.5.2.6 in this annex**
Agricultural Pests	-	Profiled in Volume 1, Section 3.3.9; not a priority due to being outside jurisdictional mission and authority
Sea Level Rise	-	Profiled in Volume 1, Section 3.3.9; not a priority due to low probability and impact potential
Climate Change	**Medium**	**Profiled in Volume 1, Section 3.3.9, and Section 10.5.2.7 in this annex** and discussed as a compounding hazard in relevant profiles
Dam Failure	-	Profiled in Volume 1, Section 3.3.3; not a priority due to low probability and impact potential

10.5.2 Vulnerability to Specific Hazards

Assessing vulnerabilities exposes the unique characteristics of individual hazards and begins the process of narrowing down which areas within the city are vulnerable to specific hazard events. The vulnerability assessment considered unique local knowledge of hazards and impacts and a GIS overlaying method for examining such vulnerabilities in more depth. Using these methods, the college's planning group estimated vulnerable populations, properties, and assets, and potential losses. In addition, the exposure of city assets to drought, geological, earthquake, wildfire and flood hazards were also considered.

Many of the hazard profiles include a snapshot map and damage estimation tables that illustrate the college's vulnerabilities to those specific hazards. These maps assisted the planning group in understanding the hazard exposure of populations, parcels, and critical facilities and infrastructure. Each snapshot map contains an exposure summary that displays the percentage of the population, the improvement and content value of parcels, and the amount of critical infrastructure that is exposed. For hazards without geospatial extents, such as drought and severe weather, narratives are provided instead of exposure maps and tables.

Based on the hazard prioritization exercise, this vulnerability assessment focuses on seven hazards for the college, some of which encompass subhazards such as Liquefaction and Heavy Rain

Wildfire
SECTION 10.5.2.1



Earthquake
SECTION 10.5.2.2



Flood
SECTION 10.5.2.3



Drought
SECTION 10.5.2.4



Severe Weather
SECTION 10.5.2.5



Extreme Heat
SECTION 10.5.2.6



Climate Change
SECTION 10.5.2.7



10.5.2.1 Wildfire Hazard

Wildfire risk at Napa Valley College is primarily associated with its proximity to wildland vegetation and areas mapped within the Wildland Urban Interface (WUI). While the main campus is located within the developed portion of the Napa Valley floor, surrounding open space, agricultural lands, and riparian corridors create conditions where wildfire could impact campus operations, particularly during periods of extreme heat, drought, and wind-driven fire events.

At the main campus, wildfire exposure is concentrated along the western and southern edges of the property, where the campus transitions into open space, vineyard areas, and natural vegetation near the Napa River corridor and Kennedy Park. As shown in Figure 10-8 and Figure 10-9 and summarized in Table 10-5, portions of the campus fall within or adjacent to WUI-designated areas, where fire could spread from vegetated landscapes toward developed facilities. Although urban development and irrigated landscapes provide some buffer, ember cast during wind-driven events remains a primary concern. Spot fires ignited by embers could impact parking areas, landscaped zones, and building perimeters, particularly where defensible space is limited.

The St. Helena campus is located in a more rural and vegetated setting, with greater proximity to hillside fuels and wildland vegetation. This increases the potential for direct flame exposure, radiant heat, and ember intrusion during a wildfire event. Narrow roadways and limited access routes in up-valley areas may also affect emergency response and evacuation timing compared to the main Napa campus.

Across both campuses, wildfire impacts may include disruption to campus operations due to smoke, poor air quality, and precautionary closures, even in the absence of direct fire damage. Critical vulnerabilities include outdoor gathering areas, parking lots, and building edges adjacent to vegetation, as well as utility systems that could be affected by Public Safety Power Shutoffs (PSPS) or fire-related outages.

The College's transient population, including students, staff, and visitors, presents additional challenges for evacuation and emergency communication during rapidly evolving wildfire events. Many individuals on campus may be unfamiliar with evacuation routes or emergency procedures, increasing the importance of clear communication and preparedness measures.

As identified in Problem Statement ps-WF-NVC-180, portions of Napa Valley College are located within the WUI, underscoring the need for continued mitigation actions such as vegetation management, defensible space maintenance, hardening of structures against ember intrusion, and ongoing public education and awareness efforts. By addressing these vulnerabilities, the College can reduce wildfire risk and enhance the safety and resilience of its campus community.

Table 10-5: Napa Valley College Wildfire Exposure

Infrastructure Type	Critical Infrastructure - Wildfire Severity Zone								
	SRA Very High	LRA Very High	Very High Total	SRA High	LRA High	High Total	SRA Moderate	LRA Moderate	Moderate Total
Campus/Building	-	-	-	-	1	1	-	-	-

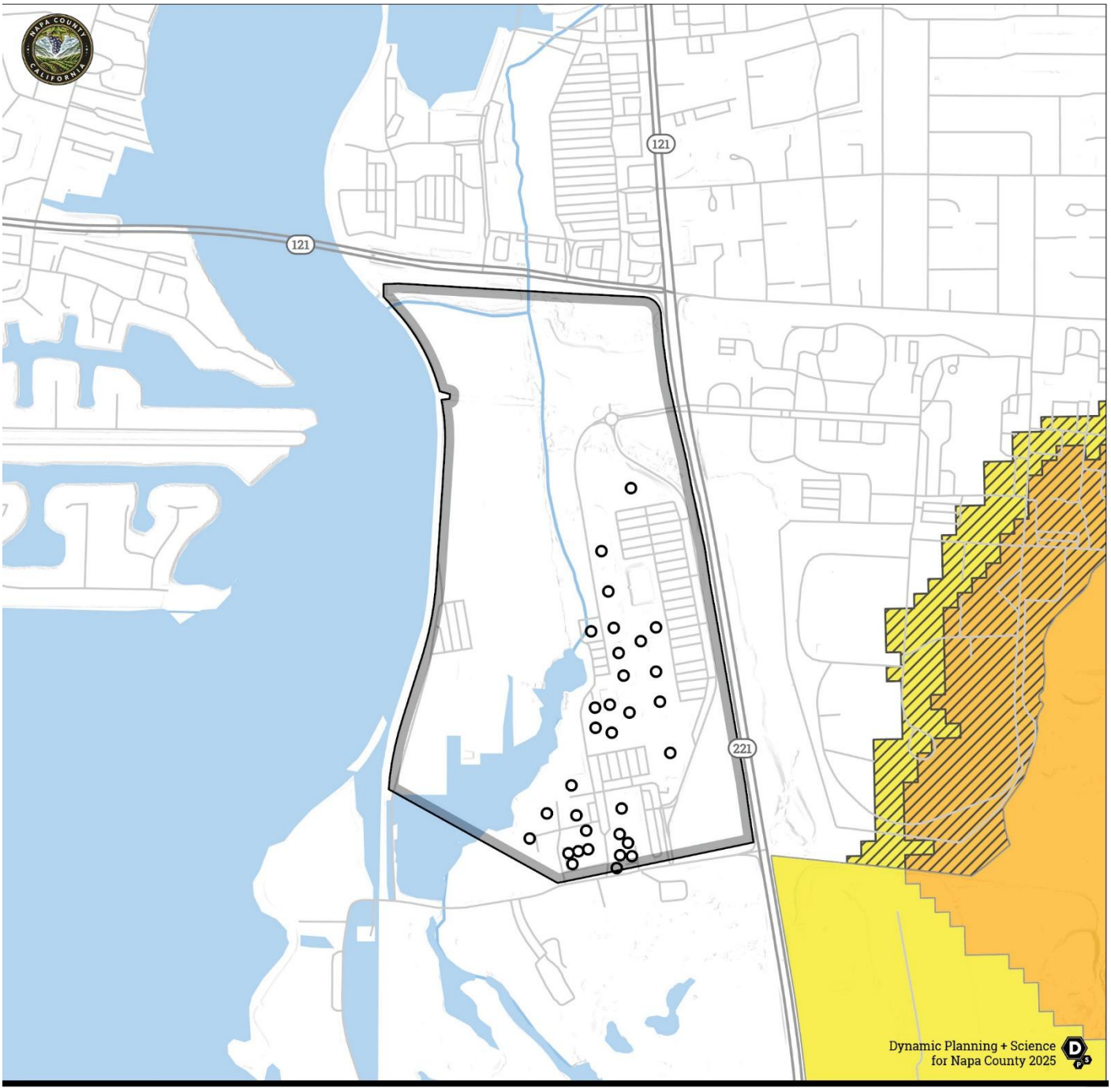


Figure 10-8: Napa Valley College Wildfire Risk (Main Campus)

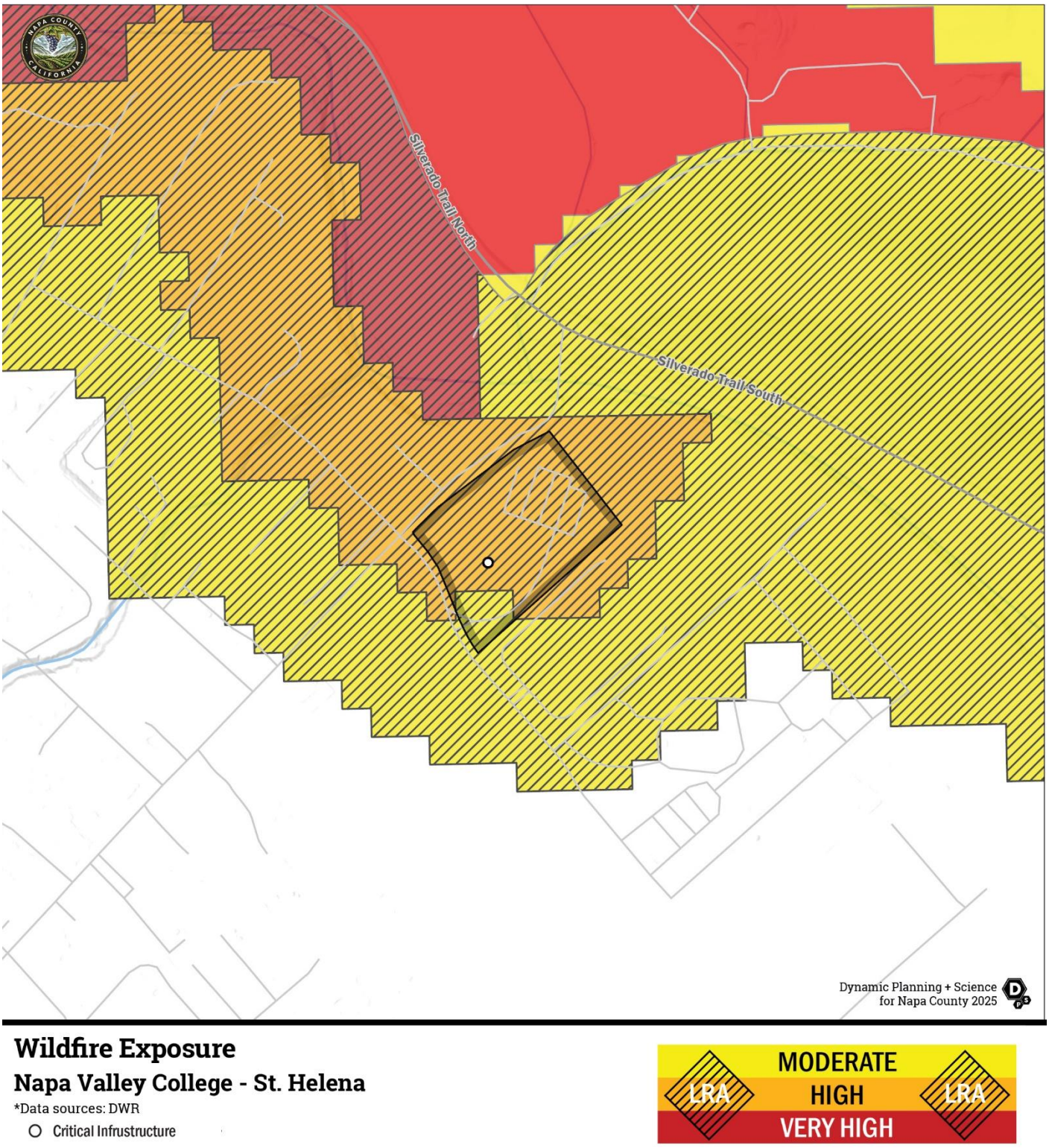


Figure 10-9: Napa Valley College Wildfire Risk (St. Helena Campus)

10.5.2.2 Earthquake Hazard

Napa Valley College is exposed to significant earthquake risk due to its location within a seismically active region influenced by nearby fault systems, including those associated with the 2014 South Napa earthquake. Ground shaking at the campus is expected to be strong to very strong during a major seismic event, with the potential for widespread impacts to buildings, infrastructure, and campus operations.

Two earthquake scenarios were evaluated to understand potential impacts to the College: a magnitude 6.7 West Napa event and a magnitude 7.1 Hunting Creek Berryessa event. As shown in Figure 10-10 and Figure 10-12 and summarized in Table 10-6 and Table 10-7, both scenarios result in similar exposure conditions at the campus scale. In each case, the Napa Valley floor experiences shaking intensities capable of causing moderate to significant damage. While the geographic distribution and intensity vary slightly between scenarios, the level of impact to Napa Valley College remains comparable.

The main campus includes a mix of building types constructed over multiple decades. Some facilities date back to earlier construction eras and may not have been originally designed to current seismic standards. Although many buildings have been upgraded or replaced over time, older structures and infrastructure may still be more susceptible to structural damage, nonstructural failures, and functional disruption during strong ground shaking. Variations in subsurface conditions across the campus, particularly between upper and lower elevations, may further influence how seismic forces are experienced at different locations.

A major earthquake could result in casualties, damage to buildings and utilities, and prolonged disruption to campus operations. Potential impacts include loss of instructional space, damage to laboratory equipment, hazardous material releases, and interruption of water, power, and communications systems. Even moderate structural damage could render key facilities unusable, affecting the College's ability to maintain continuity of operations. Disruptions to surrounding transportation corridors and regional infrastructure may further delay emergency response and recovery.

The College supports a large and dynamic daytime population that includes students, faculty, staff, and visitors. Many individuals on campus may be unfamiliar with emergency procedures or may require additional assistance during evacuation or sheltering. This transient population increases the importance of preparedness, training, and effective emergency communication systems.

In addition to physical vulnerabilities, evolving building codes and seismic design standards require periodic evaluation of existing facilities to ensure they meet current safety expectations. Continued investment in seismic retrofits, code compliance, and campus-wide preparedness measures remains essential to reducing earthquake risk.

Table 10-6: Napa Valley College Earthquake Exposure (M6.7 West Napa)

Critical Infrastructure - M6.7 West Napa				
Infrastructure Type	VIII - Severe	VII - Very Strong	VI - Strong	V - Moderate
Campus/Building	32	-	1	-

Table 10-7: Napa Valley College Earthquake Exposure (M7.1 Hunting Creek Berryessa)

Critical Infrastructure - M7.1 Hunting Creek Berryessa			
Infrastructure Type	VIII - Severe	VII - Very Strong	VI - Strong
Campus/Building	-	-	33

Liquefaction

Portions of the Napa Valley College main campus are located in areas with moderate to high liquefaction susceptibility, particularly in lower-lying areas near the Napa River and adjacent alluvial soils. As shown in Figure 10-14 and Figure 10-15, these areas are underlain by younger, saturated soils that may lose strength during strong ground shaking.

Liquefaction occurs when saturated, unconsolidated soils behave like a liquid under seismic loading. This can result in ground settlement, lateral spreading, and loss of bearing capacity beneath structures and infrastructure. Areas west of the campus and near Kennedy Park exhibit higher liquefaction potential, with localized zones extending toward the lower portions of the campus. Variability in soil conditions across the campus increases the potential for uneven ground movement during an earthquake.

Liquefaction-related impacts may damage building foundations, underground utilities, roadways, and drainage systems, even in areas where structural shaking damage is otherwise limited. Infrastructure such as water, sewer, and electrical systems may be particularly vulnerable to displacement or rupture.

While not all areas of the campus are equally susceptible, the presence of liquefiable soils in lower elevation zones underscores the need for site-specific geotechnical considerations in future development and retrofit projects. Mitigation strategies such as ground improvement, deep foundations, and flexible utility connections can help reduce the risk of damage associated with liquefaction. In addition, liquefaction risks off campus may impact transportation infrastructure and impede access for students and faculty.

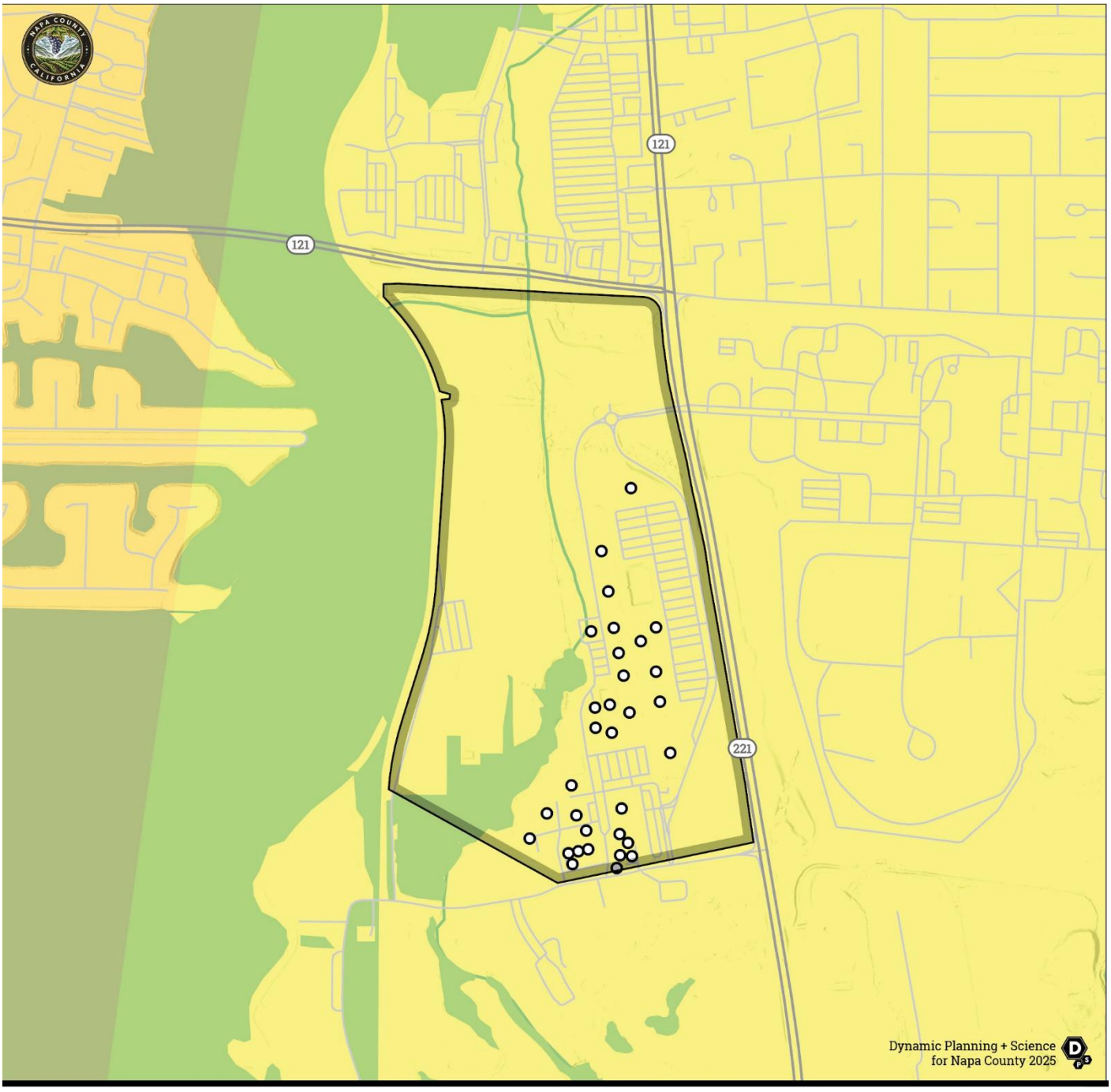


Figure 10-10: Napa Valley College Earthquake Risk (M6.7 West Napa) (Main Campus)

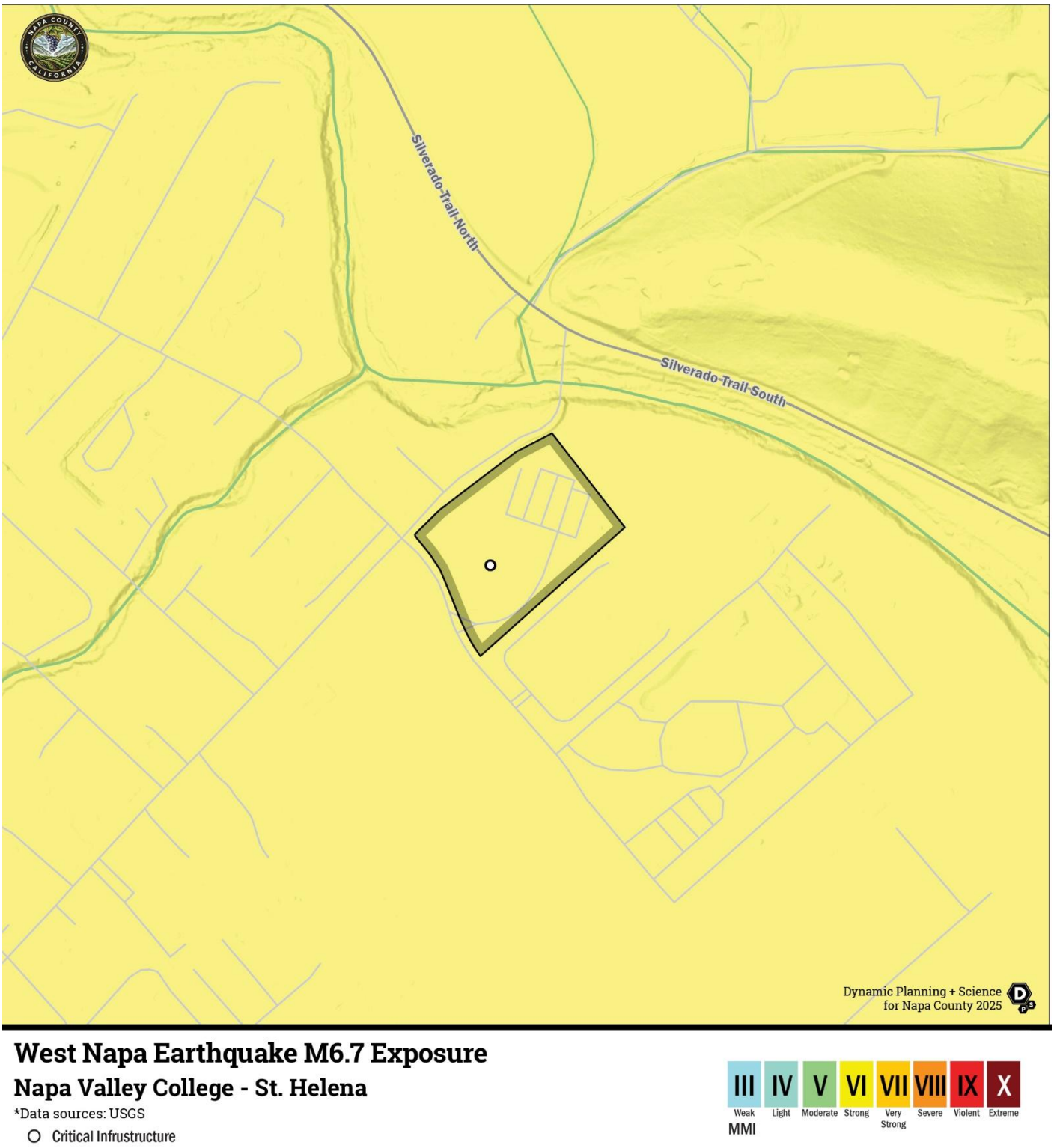


Figure 10-11: Napa Valley College Earthquake Risk (M6.7 West Napa) (St. Helena Campus)

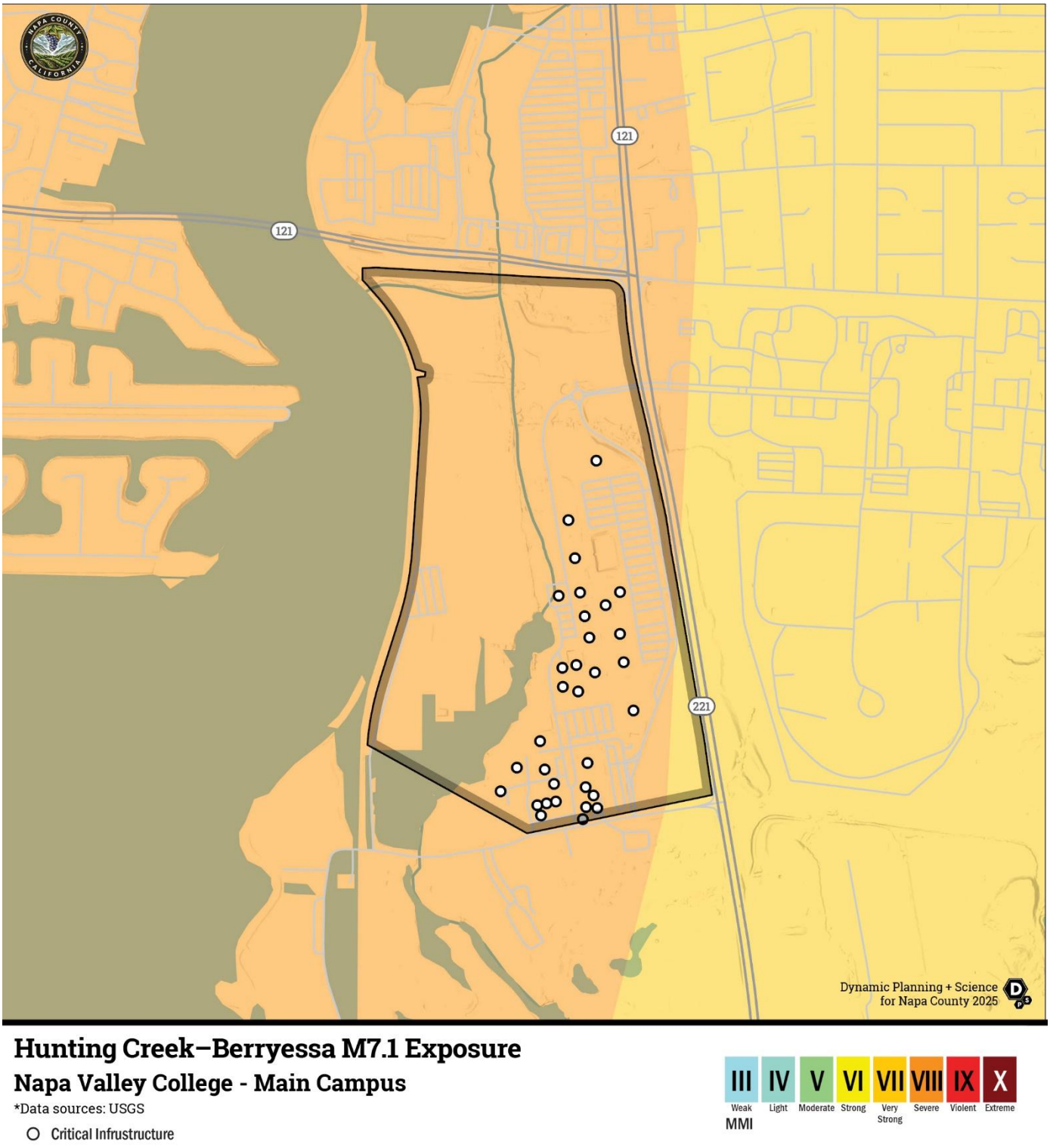


Figure 10-12: Napa Valley College Earthquake Risk (M7.1 Hunting Creek Berryessa) (Main Campus)

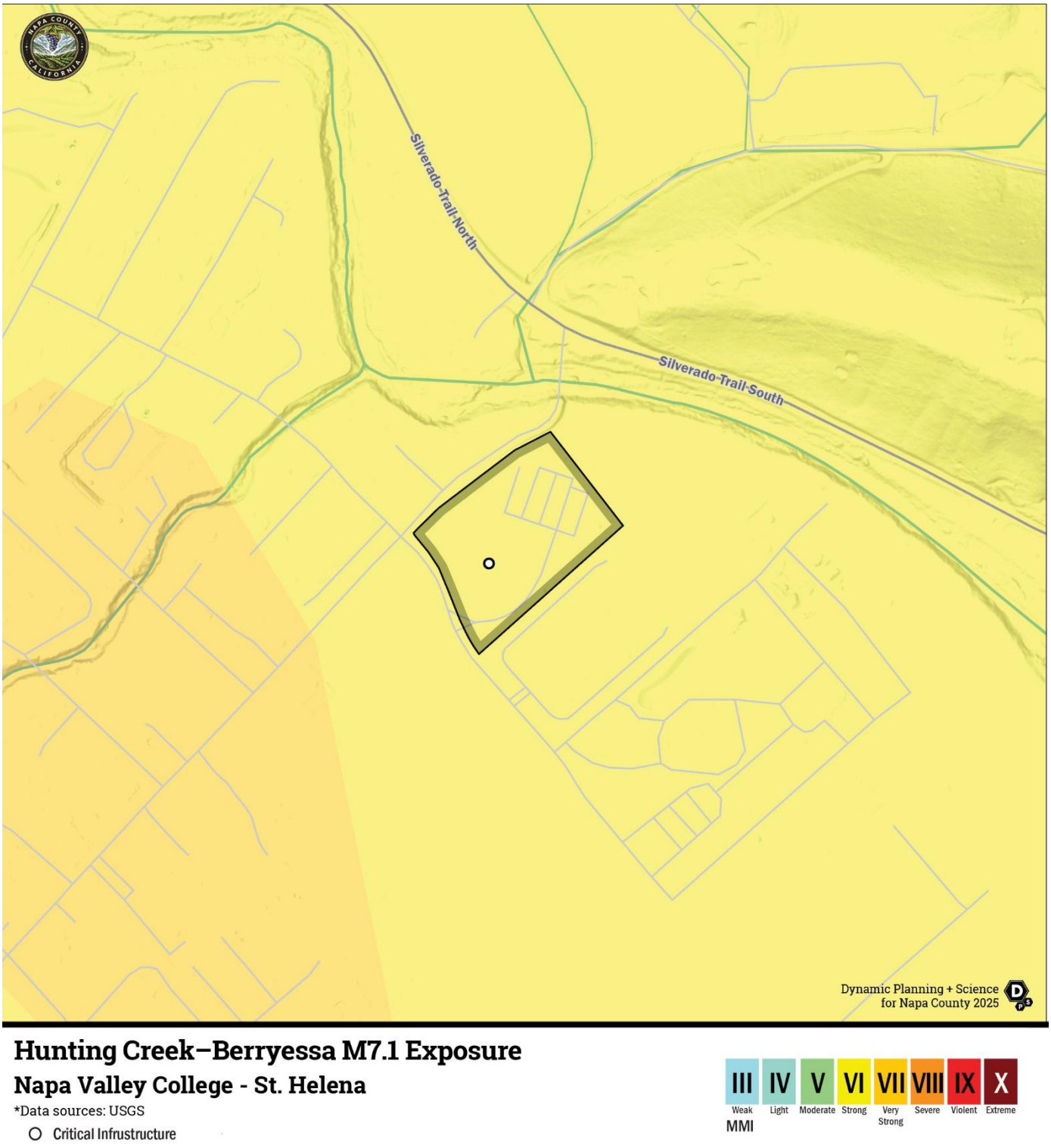


Figure 10-13: Napa Valley College Earthquake Risk (M7.1 Hunting Creek Berryessa) (St. Helena Campus)

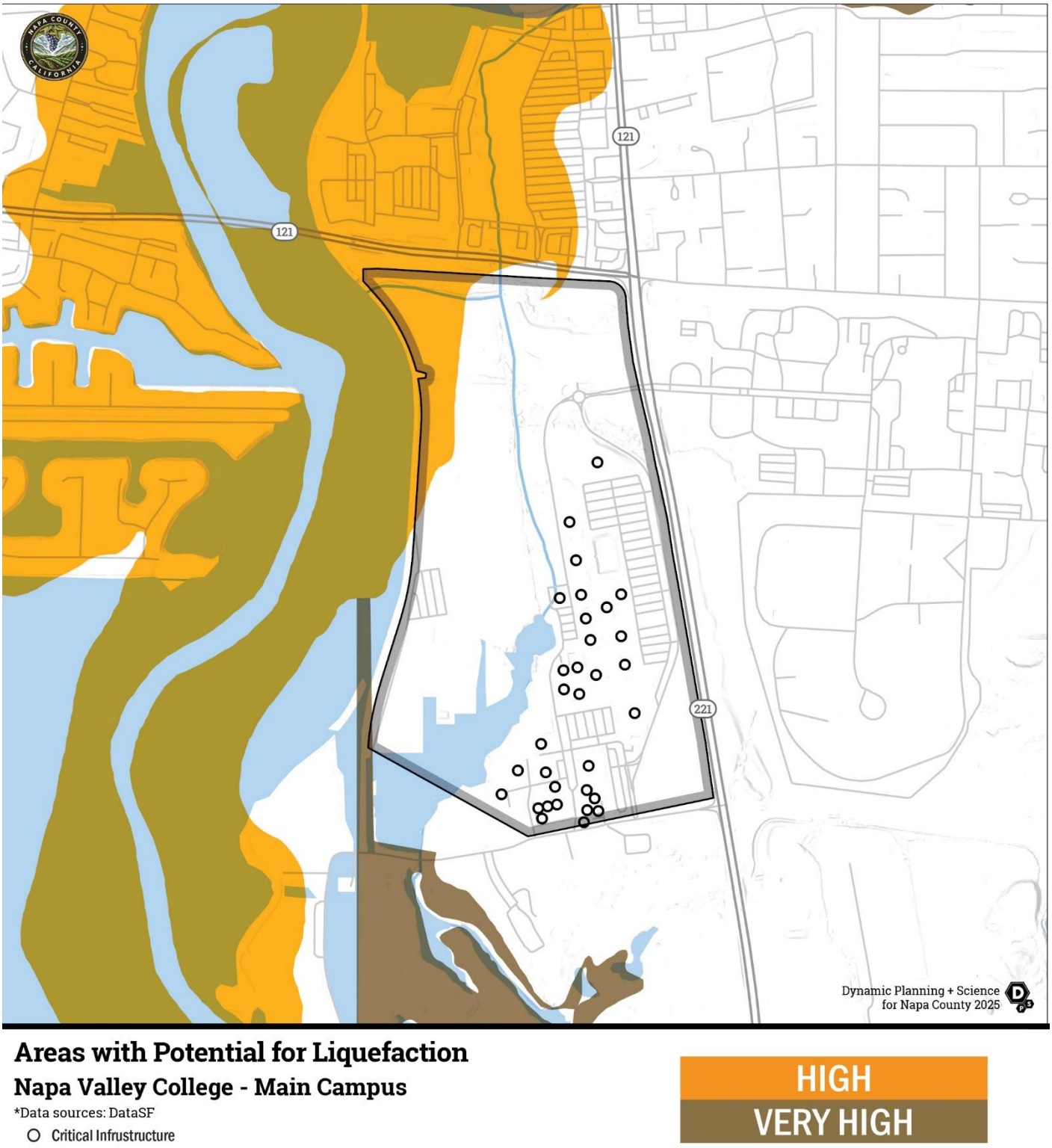


Figure 10-14: Napa Valley College Liquefaction Risk (Main Campus)



Figure 10-15: Napa Valley College Liquefaction Risk (St. Helena Campus)

10.5.2.3 Flood Hazard

Flooding presents a localized but meaningful hazard for Napa Valley College, particularly at the main campus, which is situated on the Napa Valley floor in close proximity to the Napa River and adjacent drainage features. As shown in Figure 10-16 and Figure 10-17 and summarized in Table 10-8, portions of the campus extend into mapped 100-year and 500-year flood hazard areas, with the highest risk concentrated along the western and northwestern edges of the campus near Kennedy Park and the river corridor.

The campus setting reflects a transition from higher ground near the eastern portions of the site to lower elevation areas toward the river. These lower-lying areas are more susceptible to overbank flooding, ponding, and backwater effects during major storm events. Flooding in this area is influenced by a combination of riverine overflow, high groundwater conditions, and constrained drainage capacity, particularly during intense winter storms and atmospheric river events when runoff volumes exceed system capacity.

While the core academic and administrative buildings are generally located outside of the most hazardous floodway areas, several campus facilities, open spaces, and circulation routes are located within or adjacent to mapped flood zones. Flooding in these areas could result in temporary inundation of roadways, parking areas, athletic fields, and utility systems, potentially limiting site access and disrupting campus operations. As shown on the exposure maps, critical access routes connecting the campus to Silverado Trail and surrounding road networks may also be affected, which could delay emergency response or evacuation during a flood event.

In addition to on-campus impacts, flooding along the Napa River and surrounding low-lying areas may disrupt regional transportation corridors and lifeline infrastructure that serve the College. These off-site impacts can isolate the campus, affect student and staff access, and prolong recovery following a major storm event. The College's proximity to agricultural lands and open space also increases the potential for debris, sediment, and localized drainage issues to influence flood behavior on and near the site.

Although large-scale structural flooding of core campus buildings appears limited under mapped conditions, the presence of flood-prone areas at the campus periphery highlights the importance of site drainage management, infrastructure resilience, and emergency access planning. Future changes in precipitation intensity, watershed conditions, and potential climate-driven increases in extreme storm events may expand the extent or frequency of flooding in these areas.

Overall, Napa Valley College's flood vulnerability is characterized by moderate exposure concentrated in lower elevation and peripheral areas of the campus, with primary risks related to access disruption, infrastructure impacts, and localized inundation rather than widespread structural damage. Continued coordination with regional flood management efforts and targeted on-site mitigation will be important to maintaining campus functionality during flood events.

Table 10-8: Napa Valley College Flood Exposure

Infrastructure Type	Flood Fringe	Floodway	100-YR Total	500-YR sans 100-YR	500-YR Total
Campus/Building	-	-	-	2	2

National Flood Insurance Program

The National Flood Insurance Program (NFIP) makes federally backed flood insurance available to homeowners, renters, and business owners in participating communities. FEMA has prepared a detailed Flood Insurance Study (FIS) for Napa County and municipalities. The study presents water surface elevations for floods of various magnitudes, including the 1% annual chance flood (100-YR flood) and the 0.2% annual chance flood (500-YR flood). Base flood elevations and the boundaries of the 100- and 500-YR floodplains are shown on Flood Insurance Rate Maps (FIRMs), which are the principal tools for identifying the extent and location of the flood hazard. FIRMs are the most detailed and consistent data source available, and for many communities they represent the minimum area of oversight under their floodplain management program. See Section 4 of Volume 1 for general information on the NFIP.

Napa Valley College is not a county or a municipality and, thus, is not eligible to participate in NFIP. Volume 1 describes Napa County's participation in NFIP.

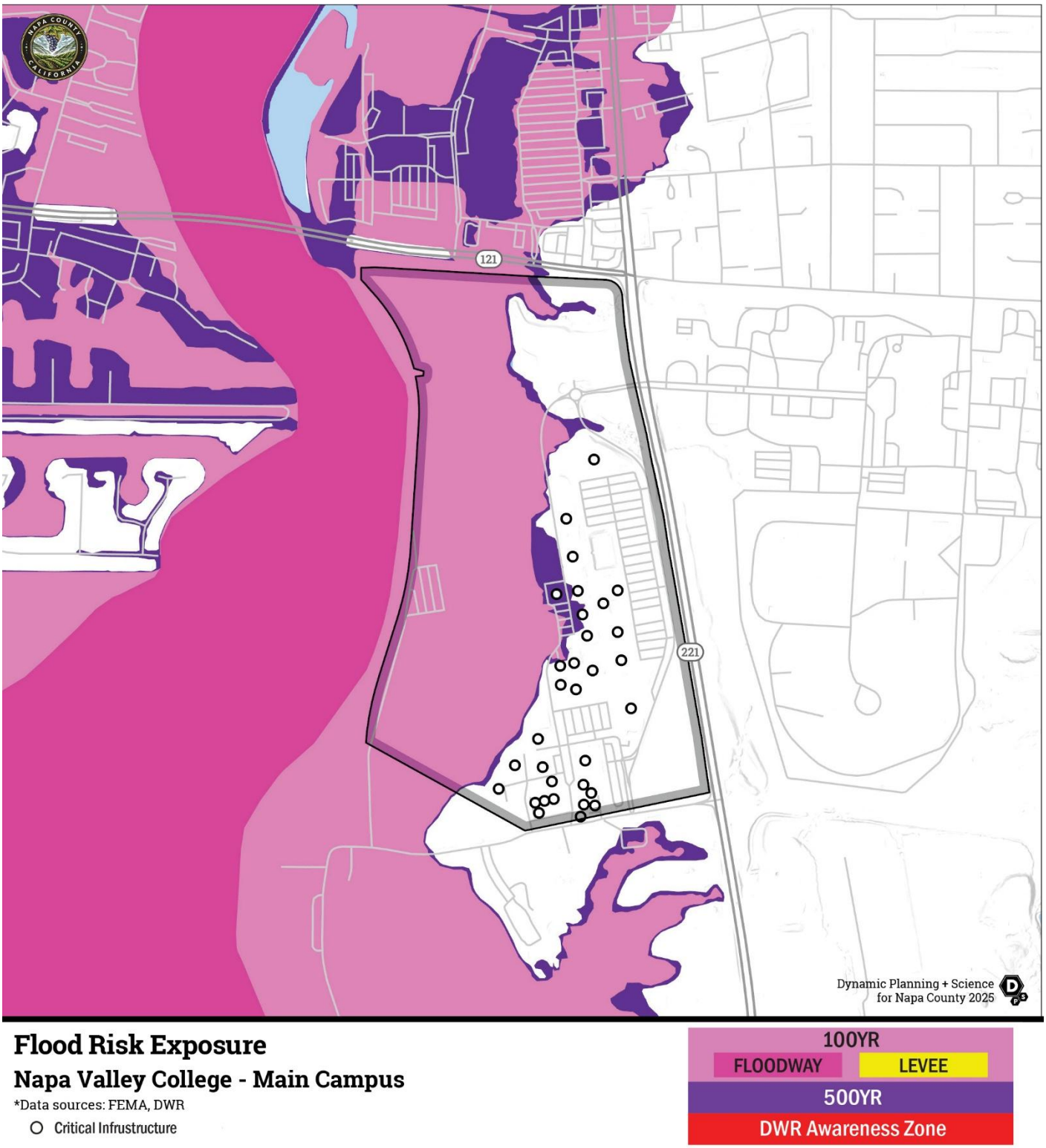


Figure 10-16: Napa Valley College Flood Risk (Main Campus)

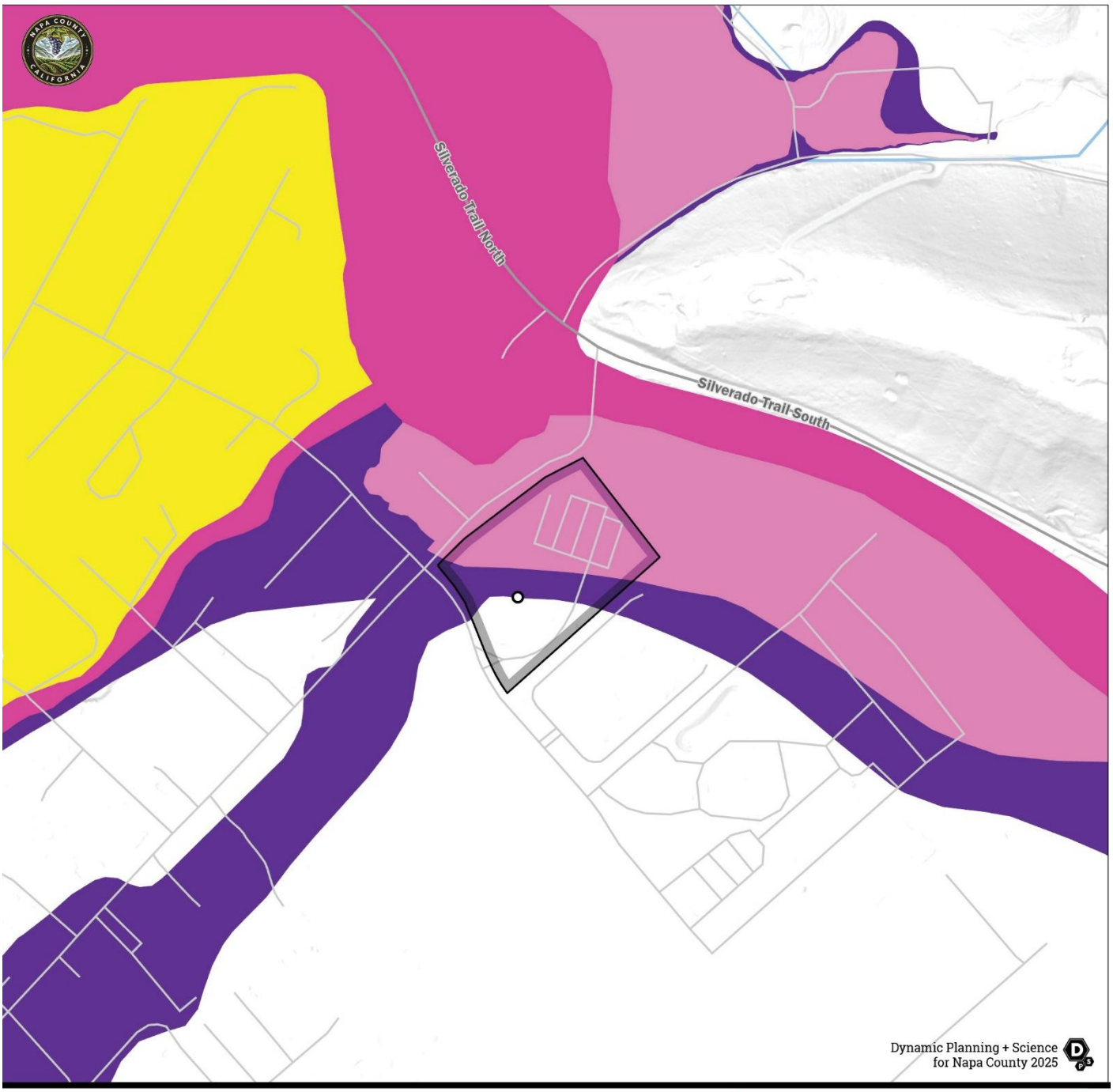


Figure 10-17: Napa Valley College Flood Risk (St. Helena Campus)

10.5.2.4 Drought Hazard

The National Drought Monitor provides drought data and maps nationally and on a localized, watershed scale. The National Drought Monitor is the product of 11 agencies, including the NDMC, NOAA and USDA, and is available at http://droughtmonitor.unl.edu/. The National Drought Monitor categorizes the level of drought from D0 through D4, with D4 being the highest "exceptional drought." Table 10-9 depicts drought classifications and impacts from the level of drought occurrence in California, while Figure 10-18 shows a time series of the level of drought in Napa County from 2000 to 2025 according to the National Drought Monitor.

Drought is a recurring and long-term hazard affecting Napa Valley College due to the region's Mediterranean climate, characterized by highly seasonal precipitation and extended dry periods. Prolonged intervals of below-average rainfall, reduced Sierra Nevada snowpack, and elevated temperatures can strain regional water supplies and affect the College's operations and surrounding environment. While drought does not typically result in immediate physical damage to campus facilities, its cumulative effects can be significant and long-lasting.

Napa Valley College relies on regional water systems that are sensitive to drought conditions. Extended dry periods can reduce available water supplies, increase demand during hotter conditions, and place stress on water delivery infrastructure. In response, water conservation measures may be implemented, affecting campus landscaping, irrigation, and facility operations. These conditions may also require operational adjustments to maintain campus functions while complying with regional water use restrictions.

Drought conditions can also exacerbate other hazards that affect the College. Dry vegetation and surrounding open space areas, including nearby agricultural lands and natural landscapes, may experience increased fire risk during prolonged drought periods. Reduced soil moisture can contribute to soil instability and erosion, particularly when drought conditions are followed by intense rainfall events. In addition, degradation of nearby riparian areas associated with the Napa River may reduce natural flood attenuation capacity, indirectly influencing flood risk near the campus.

The economic and social effects of drought can also influence the College community. Increased utility costs and regional economic impacts, particularly in the agricultural sector, may affect students, faculty, and staff. Vulnerable populations within the campus community, including low-income students and those experiencing housing or financial instability, may be disproportionately impacted by rising costs and resource constraints during prolonged drought conditions.

Climate change is expected to increase the frequency and severity of drought in California, with longer dry periods and more variable precipitation patterns. These trends create ongoing uncertainty in water supply reliability and highlight the importance of water conservation, sustainable campus operations, and long-term resilience planning at Napa Valley College.

Table 10-9: Drought Classifications and Impacts

Category	Description	Possible Impacts
D0	Abnormally Dry	▪ Soil is dry; irrigation delivery begins early ▪ Dryland crop germination is stunted ▪ Active fire season begins
D1	Moderate Drought	▪ Dryland pasture growth is stunted; producers give supplemental feed to cattle ▪ Landscaping and gardens need irrigation earlier; wildlife patterns begin to change ▪ Stock ponds and creeks are lower than usual
D2	Severe Drought	▪ Producers increase water efficiency methods and drought-resistant crops ▪ Grazing land inadequate ▪ Fire season is longer, with high burn intensity, dry fuels, and large fire spatial extent, more fire crews on staff ▪ Lake- and river-based tourism declines; boat ramps close ▪ Trees are stressed; plants increase reproductive mechanisms; wildlife diseases increase ▪ Water temperatures increase; programs to divert water to protect fish begin ▪ River flows decrease; reservoir levels are low and banks are exposed
D3	Extreme Drought	▪ Federal water is not adequate to meet irrigation contracts; extracting supplemental groundwater is expensive ▪ Fire season lasts year-round; fires occur in typically wet parts of the state; burn bans are implemented ▪ Ski and rafting business are low; mountain communities suffer ▪ Low water levels impede fish migration and cause lower survival rates ▪ Wildlife encroaches on developed areas; little native food and water is available for bears, which hibernate less ▪ Water sanitation is a concern; reservoir levels drop significantly; surface water is nearly dry; flows are very low; water theft occurs ▪ Livestock need supplemental feed, cattle and horses are sold; little pasture remains ▪ Well and aquifer levels decrease; homeowners drill new wells
D4	Exceptional Drought	▪ Fire season is very costly; number of fires and areas burned are extensive ▪ Many recreational activities are affected ▪ Fields are left fallow; orchards are removed; vegetable yields are low; honey harvest is small; agricultural unemployment is high, food aid is needed ▪ Fish rescue and relocation begin; pine beetle infestation occurs; forest mortality is high; wetlands dry up; wildlife death is widespread; algae blooms appear ▪ Poor air quality affects health: greenhouse gas emissions increase as hydropower production decreases; West Nile outbreaks rise ▪ Water shortages are widespread; surface water is depleted; federal irrigation water deliveries are curtailed; water prices are extremely high; wells are dry, more and deeper wells are drilled; water quality is poor

Source: Adapted from U.S. Drought Monitor Drought Classifications and Impacts

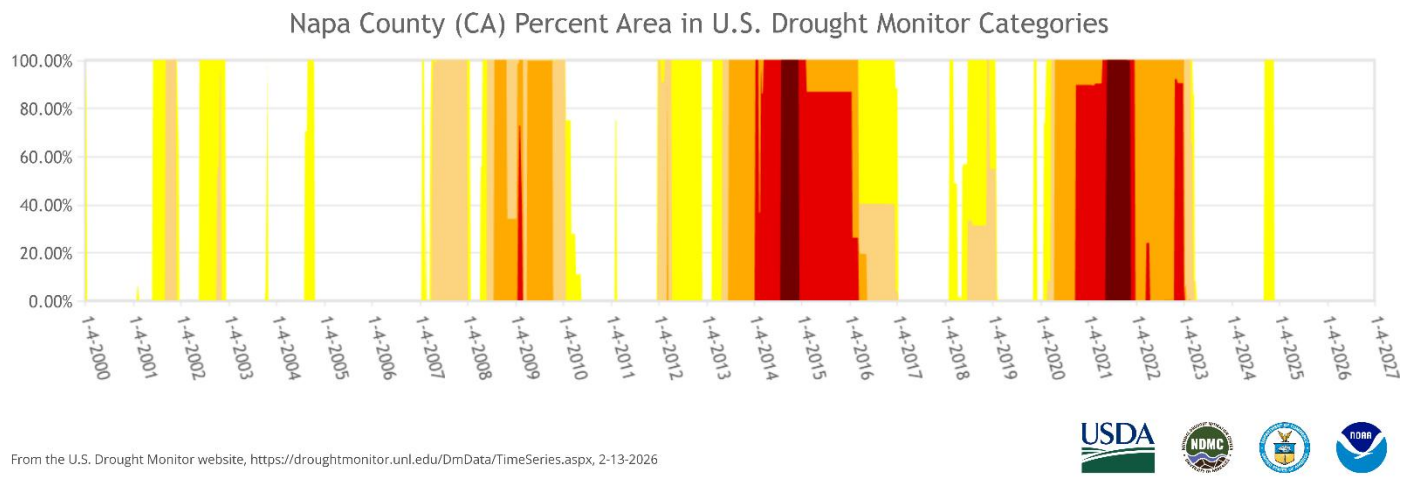


Figure 10-18: Drought Severity Timeline 2000-2025

10.5.2.5 Severe Weather Hazard

Although the college benefits from a Mediterranean climate with some moderating marine influence from San Pablo Bay, the community remains vulnerable to a range of severe weather hazards, including high wind events and heavy rainfall. While these hazards may occur less frequently or with lower intensity than hazards such as wildfire or earthquake, they can still result in significant impacts to college infrastructure, services, and students and staff.

High Wind

High wind events are a recurring severe weather hazard affecting Napa Valley College, particularly during winter storm systems and offshore wind conditions. Winds may be funneled through the Napa Valley and adjacent hills, producing localized gusts that can impact the campus and surrounding areas. These events have the potential to damage buildings, disrupt campus operations, and create safety hazards for students, faculty, staff, and visitors.

On campus, high winds may result in downed trees, fallen branches, and debris that can block internal roadways, parking areas, and pedestrian pathways. Damage to overhead utilities and nearby electrical infrastructure can lead to power outages, affecting classroom instruction, administrative functions, and critical systems such as communications and safety equipment. Outdoor features, including athletic facilities, signage, and temporary structures, may be particularly vulnerable to wind damage.

High winds can also exacerbate other hazards affecting the College. During dry conditions, strong winds can increase wildfire risk in surrounding open space and agricultural areas by accelerating fire spread and transporting embers. In addition, falling debris and reduced visibility during wind events may create hazardous conditions along key access routes such as Napa Vallejo Highway and surrounding roadways, potentially limiting emergency access or delaying evacuation.

Although most campus buildings are constructed to modern codes, localized vulnerabilities may exist in older structures, roofing systems, and exterior elements. The College's reliance on safe access, reliable power, and outdoor circulation areas highlights the importance of ongoing maintenance, vegetation management, and emergency preparedness to reduce risks associated with high wind events.

Heavy Rain

Napa Valley College is exposed to severe winter storm events that can produce heavy rainfall, localized flooding, and hazardous site conditions. These events are often associated with atmospheric river systems that bring prolonged and intense precipitation to the Napa Valley, increasing the potential for drainage system exceedance and localized inundation both on and adjacent to the campus.

Heavy rainfall can result in saturated soils across the campus and surrounding areas, particularly in lower-lying portions of the site near the Napa River and adjacent open space. These conditions may lead to ponding in parking areas, reduced effectiveness of stormwater infrastructure, and localized erosion or sediment transport. While the campus is not located in steep hillside terrain, intense rainfall following dry periods may still contribute to minor slope instability or soil movement in landscaped and undeveloped areas.

Severe storm events may also include short-duration high intensity rainfall, lightning, and occasional hail, all of which can pose risks to campus facilities, outdoor infrastructure, and personal safety. Impacts to buildings are generally limited, but roof drainage systems, exterior features, and utility connections may be stressed during peak storm conditions.

Heavy rain events often occur in combination with high winds, increasing the likelihood of power outages, fallen trees, and debris. These combined impacts can disrupt campus operations, limit access to and from the site, and affect critical functions such as communications, lighting, and instructional continuity. Flooded roadways and debris along key access routes, including Napa Vallejo Highway and surrounding local streets, may further constrain emergency response and evacuation.

The College's large daytime population, including students, faculty, staff, and visitors, may face challenges during severe weather events, particularly those unfamiliar with campus emergency procedures or dependent on reliable transportation and communication systems. As a result, effective stormwater management, infrastructure maintenance, and emergency preparedness planning are essential to reducing risks associated with heavy rainfall and ensuring continuity of campus operations.

10.5.2.6 Extreme Heat Hazard

Within Napa County, geographic patterns in extreme heat are mostly influenced by topography. Napa County's climate is influenced by its location between mountain ranges and proximity to San Pablo Bay, which typically provides some moderation of temperature extremes. While extreme heat days are defined by localized variation from norms, the inland valley areas tend to experience higher temperatures than coastal or mountain areas. That being said, air conditioning systems are less prevalent in the county,

including in older school buildings, and the population may be less adapted to higher temperatures compared to regions which regularly experience high heat events.

However, despite the marine and mountain influences present, the county is increasingly experiencing periods of elevated temperatures, particularly during late summer and early fall when offshore flow conditions reduce coastal cooling effects. In recent decades, Napa has seen an increase in the frequency, duration, and intensity of extreme heat events, a trend that is expected to continue under changing climate conditions. Statewide events, including those in 2017 and 2020, resulted in prolonged periods of high temperatures across inland portions of the Bay Area, including the Napa Valley. During these events, temperatures in Napa exceeded typical seasonal norms and, in some cases, approached or exceeded 100°F for multiple consecutive days.

Although Napa County is mostly rural, there are clusters of highly urbanized areas, including the Cities of Napa and St. Helena where NVC's two campuses are located. Urbanized areas experience higher temperatures than natural landscapes, creating localized pockets of higher temperatures known as heat islands. Roads and conventional building materials reflect less solar energy and absorb and re-emit more heat compared to trees and other vegetation. Heat islands can build throughout the day and worsen immediately after sunset as heat is slowly released from pavement and building material. Urban heat islands disproportionately affect low-income urban populations and people of color, communities who are more likely to occupy older, higher density housing stock with lower urban forest cover and less access to air conditioning.

Napa's valley setting contributes to heat retention, particularly during periods of high pressure and low wind, when warm air becomes trapped and nighttime cooling is limited. These conditions can result in extended heat events that persist over several days, increasing cumulative stress on residents, infrastructure, and natural systems. Unlike areas immediately adjacent to the Bay, portions of Napa experience more pronounced temperature extremes due to reduced marine influence and localized topographic effects.

Climate projections indicate that the county is likely to experience a substantial increase in both the number of extreme heat days and warm nights over time. Extreme heat days, defined as those exceeding historically high temperature thresholds, are expected to become more frequent, while warm nights will reduce opportunities for overnight cooling, compounding heat-related stress on vulnerable populations.

According to the Cal-Adapt extreme heat days and warm nights tool using a medium emissions scenario (RCP 4.5), the City of Napa will likely experience a climate change-driven increase in extreme heat days from four days per year to 15 days per year by the end of the century. Similarly, St. Helena's number of extreme heat days are projected to increase from four to 18 per year. Over the same time period, both the cities are also likely to see an increase in warm nights, from four per year to 42 nights for Napa and 25 nights for St. Helena. Table 10-10 explains the extreme heat event thresholds for the Cities of Napa and St. Helena.

Table 10-10: Cal-Adapt Extreme Heat Terms and Thresholds

Term	Cal-Adapt Definition	Thresholds for	
		City of Napa	City of St. Helena
Extreme Heat Day	Defined as a day in a year when the daily maximum/minimum temperature exceeds the 98th percentile of daily maximum/minimum temperatures based on observed historical data from 1961-1990 between April and October.	**99.2°F**	**100.4°F**
Warm Night	Defined as a day in April through October when daily minimum temperature exceeds the 98th historical percentile of daily minimum temperatures, based on observed data from 1961-1990 between April and October.	**59.3°F**	**62.1°F**
Heat Wave	Defined as four consecutive days or nights above the extreme heat / warm night threshold.	**3 days ≥ 99.2°F** or **4 nights ≥ 59.3°F**	**3 days ≥ 100.4°F** or **4 nights ≥ 62.1°F**

Source: Cal-Adapt Extreme Heat Days and Warm Nights Tool

Impacts on Students & Staff

Student and staff health risks are the most immediate concern, with vulnerable populations such as low-income or homeless students or those who are medically fragile, at elevated risk of heat-related illnesses. Among the county's vulnerable populations, lower-income students or staff living in older homes without air conditioning may be more exposed to heat events than others if nighttime temperatures remain high. In addition, some older school buildings may lack adequate air conditioning to address climate change-driven temperature increases. Heat impacts students and staff physically and mentally, especially if they are further exposed to heat throughout the day or night, and can disrupt educational operations, cause sickness, or even death in extreme cases such as while exercising outdoors.

From an infrastructure perspective, heat waves stress the power grid, raising the likelihood of blackouts that can leave campus buildings without cooling options. Prolonged extreme heat can also damage roads and utilities, as well as strain HVAC systems in school buildings and other critical facilities. Parks, athletic fields, and outdoor programs may face closures due to unsafe conditions, impacting community services and recreation.

Cascading Effects

Extreme heat can contribute to and exacerbate other hazards within Napa County. Prolonged high temperatures dry vegetation and increase wildfire risk in surrounding areas, while also contributing to degraded air quality, particularly during regional wildfire events. Heat can also intensify drought conditions by increasing evaporation rates and water demand, placing additional stress on local water resources.

10.5.2.7 Climate Change Hazard

NVC and its campuses face increasing exposure to climate-related hazards that are expected to influence both the frequency and severity of existing risks. Changes in temperature, precipitation patterns, and seasonal variability are projected to intensify hazards such as extreme heat, drought, flooding, wildfire, and severe storms, all of which have the potential to disrupt educational services and affect school operations across Napa County. Because NVC operates a distributed network of facilities, these impacts may vary by location but collectively represent a systemwide vulnerability.

Increased Annual Temperatures

Average annual temperatures across most of California have already increased by more than 1°F, with some areas experiencing rises of over 2°F when comparing the 1901–1960 average to that of 1986–2016. Daily maximum temperatures—a key indicator of extreme heat—are projected to increase by 4.4°F to 5.8°F by 2050 and by 5.6°F to 8.8°F by 2100. Heat waves that impact public health, known as heat-health events, are also expected to intensify across the state. By 2050, these events are projected to last up to two weeks longer in the Central Valley and occur four to ten times more often in the Northern Sierra region (California Natural Resources Agency, 2022).

California is already experiencing significant impacts from climate change, including prolonged drought, a lengthened wildfire season, increased coastal flooding and erosion, and widespread tree mortality. The state has observed rising average temperatures, more extreme heat days, fewer cold nights, a longer growing season, and shifts in the water cycle, with less winter precipitation falling as snow. In addition, summertime fog has declined by approximately 33%, and both snowmelt and rainwater runoff are occurring earlier in the year (Cal OES, 2018).

Long-term trends indicate a 12% to 20% decline in fog across California from 1900 through projections to 2070. Climate experts suggest that warming temperatures reduce the ability of air masses to cool enough to produce fog, which plays a critical role in supporting California's ecosystems (Grantham, Teodore; University of California, Berkeley, 2018).

These statewide trends have localized implications for the Napa Valley College and its associated campuses due to their location within the Napa Valley. The valley setting can intensify heat impacts by trapping warm air and limiting nighttime cooling, resulting in prolonged exposure to elevated temperatures across many school sites. As extreme heat events increase in frequency and duration, students, faculty, and staff may face heightened health and safety risks, particularly young children, individuals with access and functional needs, and those without reliable access to cooling. Increased temperatures may also drive higher energy demand across school facilities, placing additional strain on electrical systems and increasing the potential for power disruptions that could affect classroom operations and continuity of educational services.

Drought & Water Reliability

Climate change is expected to increase the frequency and duration of drought conditions affecting Napa Valley College. The campus relies on regional water supplies that are sensitive to prolonged dry periods,

which can reduce water availability and increase demand during hotter conditions. These impacts may require the implementation of water conservation measures that affect campus landscaping, irrigation, and facility operations.

Drought conditions can also affect the broader campus environment. Vegetation stress in landscaped areas and surrounding open space may increase maintenance needs and reduce canopy cover, contributing to higher localized temperatures. In addition, prolonged dry conditions may impact nearby riparian areas associated with the Napa River, reducing their effectiveness in supporting ecosystem health and natural stormwater functions.

Precipitation, Storms & Flooding

Climate projections indicate that precipitation is likely to occur in fewer but more intense storm events. These high-intensity storms, often associated with atmospheric rivers, can increase the risk of localized flooding and drainage system exceedance at Napa Valley College, particularly in lower-lying portions of the campus.

Heavy rainfall over short durations can lead to ponding in parking areas, stress on stormwater infrastructure, and localized erosion. When intense storms follow extended dry periods, soils may be less able to absorb water, increasing runoff and the potential for minor slope instability or sediment movement. Flooding and debris may also affect campus access routes and surrounding transportation corridors, impacting mobility and emergency response.

Wildfire & Vegetation Change

Rising temperatures and prolonged dry conditions are expected to increase wildfire risk in areas surrounding Napa Valley College. While the main campus is largely developed, it is adjacent to open space, agricultural lands, and natural vegetation that may be susceptible to wildfire. Fire events in the surrounding area can impact the campus through smoke, poor air quality, and potential evacuation or operational disruptions.

Changes in vegetation patterns, including increased plant stress and potential shifts in species composition, may contribute to higher fuel loads over time. Even without direct fire impacts, degraded air quality from regional wildfire events can affect campus operations and public health, particularly for sensitive populations.

Cascading Effects

Climate change increases the likelihood of cascading and compounding impacts across multiple hazards affecting Napa Valley College. Extreme heat can intensify drought conditions and increase wildfire risk, while drought-stressed soils may be more vulnerable to erosion during heavy rainfall. Severe storms may impact infrastructure already stressed by age or environmental conditions, and flooding can disrupt transportation and utility systems critical to campus operations.

These interconnected risks highlight the importance of integrating climate considerations into campus planning, infrastructure improvements, and emergency preparedness efforts. Proactive and adaptive strategies will be essential to maintaining safe operations and enhancing long-term resilience at Napa Valley College as climate conditions continue to evolve.

10.5.3 Climate Change Impacts & Vulnerable Populations

Climate change is expected to exacerbate many of the natural hazards affecting Napa County, increasing risks to populations that already face social, economic, or physical vulnerabilities. Rising temperatures, more extreme precipitation events, prolonged drought, and increased frequency of extreme heat are projected to intensify existing hazard conditions and create new challenges for public health, safety, and emergency response.

Certain populations in Napa County are more likely to experience disproportionate impacts from climate-related hazards. Older adults, individuals with disabilities, low-income households, renters, and households with limited English proficiency may have reduced capacity to prepare for, respond to, and recover from climate-driven events. These groups may face barriers related to mobility, access to transportation, financial resources, housing stability, or timely access to emergency information.

Extreme heat presents a growing risk to vulnerable populations, particularly elderly residents, individuals with underlying health conditions, outdoor workers, and households without adequate cooling. Heat waves can increase the incidence of heat-related illness, strain electrical systems, and worsen air quality, especially when combined with wildfire smoke. Low-income households may be less able to afford cooling costs or make energy-efficient upgrades, increasing exposure during prolonged heat events.

Flooding disproportionately affect residents and workers in low-lying areas near the Napa River and bayfront. Vulnerable populations living or working in these areas may face greater risk of displacement, property damage, and disruption of access to essential services. Flood events can also impact transportation routes and utilities, creating additional challenges for individuals who rely on public transit, medical equipment, or nearby services.

Drought and water scarcity can place added burdens on vulnerable populations by increasing utility costs, limiting access to cooling and landscaping, and reducing the resilience of natural systems that provide flood protection and cooling benefits. For low-income households and fixed-income seniors, increased water and energy costs associated with drought and heat can compound financial stress.

Climate change may also increase the frequency and duration of poor air quality events, particularly from regional wildfires. Individuals with respiratory conditions, older adults, children, and outdoor workers are especially sensitive to smoke exposure. Limited access to air filtration, clean indoor environments, or protective equipment can further increase health risks for vulnerable populations.

10.5.4 Hazard Problem Statements

As part of the mitigation action identification process, the Planning Committee for each jurisdiction identified areas of concern (aka problem statements) for their respective facilities based on the risk assessment and vulnerability analysis, utilizing the RAMP mapping and static snapshot maps. Problem statements focused on the impact, victim, or threat that the hazard could create in the jurisdiction, as described in Table 10-11. Identifying common issues and weaknesses through these problem statements assisted the planning group in understanding the realm of resources needed for mitigation.

The goal is to have at least one mitigation action for every problem statement. Projects or actions have been developed to mitigate each problem identified. See Table 10-13 for a full list of mitigation actions and corresponding problem statements that they address. Each problem statement is coded with a problem number for cross-referencing between Table 10-11 and Table 10-13

Table 10-11: Napa Valley College Hazard Problem Statements

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-DR-NVC-353	Drought	Impact	**Napa Valley College**	Prolonged drought increases utility costs and forces irrigation curtailment, causing degradation of grounds and outdoor spaces. Drought-related water service reductions can disrupt basic student services and campus activities.	ma-DR-NVC-230
ps-DR-NVC-354	Drought	Threat	**Napa Valley College**	Dependence on a single supply, limited alternative sources (non-potable/recycled), extensive irrigated areas, and aging or inefficient plumbing systems heighten NVC's exposure to drought.	ma-DR-NVC-230, ma-AH-NVC-229
ps-DR-NVC-355	Drought	Threat	**Napa Valley College**	Drought-stressed vegetation around campus elevates secondary hazards (e.g., wildfire) and can amplify operational disruptions.	ma-DR-NVC-230
ps-EQ-NVC-76	Earthquake	Threat	**Napa Valley College**	Older buildings built before benchmark seismic standard years, including those constructed in the 1960s, and those that lie atop potentially softer soils are susceptible to severe damage and failure during a major earthquake.	ma-EQ-NVC-43, ma-EQ-NVC-41
ps-EQ-NVC-83	Earthquake	Impact	**Napa Valley College**	A major earthquake could cause significant damage to campus resulting in financial losses, disruption of instruction and long-term operation challenges.	ma-EQ-NVC-43, ma-EQ-NVC-41, ma-AH-NVC-231
ps-EQ-NVC-84	Earthquake	Victim	**Napa Valley College**	Napa Valley College has a large population of students, staff, and visitors vulnerable to earthquakes. A strong seismic event could result in injury or loss of life, particularly in older buildings or crowded areas.	ma-EQ-NVC-41, ma-EQ-NVC-43, ma-AH-NVC-229
ps-FL-NVC-126	Flood	Impact	**Napa Valley College**	Napa Valley College could be impacted by casualties, property damage, business interruption, financial loss, and environmental contamination during a flood event.	ma-AH-NCo-6, ma-FL-NVC-68, ma-FL-NVC-110, ma-AH-NVC-229

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-FL-NVC-127	Flood	Threat	**Napa Valley College**	Both the Napa and St. Helena campuses are at risk of riverine flooding exacerbated by climate change.	ma-AH-NCo-6, ma-FL-NVC-68, ma-FL-NVC-110
ps-HH-NVC-351	High Heat	Victim	**Napa Valley College**	Students, staff, and visitors—particularly those in non-conditioned spaces, outdoor workers, athletes, and medically vulnerable populations—are at risk of heat stress during extreme heat events.	ma-HH-NVC-233, ma-AH-NVC-229
ps-HH-NVC-352	High Heat	Impact	**Napa Valley College**	Extreme heat elevates cooling demand and utility costs, strains HVAC systems, reduces instructional hours, and cancels outdoor programs and events.	ma-WF-NVC-228, ma-HH-NVC-233, ma-AH-NVC-231
ps-SW-NVC-146	Severe Weather	Impact	**Napa Valley College**	Napa Valley College is subject to heavy winter rains that can cause localized flooding, environmental contamination, and property and infrastructure damage.	ma-SW-NCo-81, ma-SW-NCo-82, ma-SW-NVC-125, ma-FL-NVC-68
ps-SW-NVC-150	Severe Weather	Victim	**Napa Valley College**	Napa Valley College has a population of students, staff, and visitors that is vulnerable to severe weather impacts, such as when walking between buildings or during power outages.	ma-SW-NCo-81, ma-SW-NCo-82, ma-AH-NCo-5, ma-SW-NVC-125, ma-SW-NVC-232, ma-AH-NVC-229
ps-SW-NVC-349	Severe Weather	Threat	**Napa Valley College**	Climate change is increasing the frequency and intensity of severe weather events.	ma-FL-NVC-68, ma-SW-NVC-232
ps-SW-NVC-350	Severe Weather	Impact	**Napa Valley College**	High-wind can down trees and damage roofs; trigger power outages and campus closures; disrupt instruction and events; and drive up emergency maintenance and insurance costs.	ma-SW-NVC-232, ma-AH-NVC-231
ps-WF-NVC-180	Wildfire	Threat	**Napa Valley College**	Portions of the Napa Valley College campus are within the Wildland Urban Interface (WUI), and the campus is vulnerable to post-wildfire hazards such as erosion, debris flow, and flooding.	ma-WF-NCo-94, ma-WF-NVC-126, ma-WF-NVC-126, ma-WF-NVC-228
ps-WF-NVC-348	Wildfire	Victim	**Napa Valley College**	Wildfire smoke from regional fires such as the 2020 Glass Fire has caused severe air quality issues, forcing campus closures. Poor air quality poses health risks to vulnerable students and staff and may require indoor filtration and operational plans.	ma-WF-NVC-228, ma-AH-NVC-229
ps-WF-NVC-356	Wildfire	Impact	**Napa Valley College**	Fire weather conditions and nearby wildfires often lead to power outages or trigger PSPS events.	ma-AH-NVC-231

10.6 Mitigation Strategy

This section provides the framework for how the Napa Valley College will reduce natural hazard risk within its jurisdiction while supporting the broader goals of the Napa County MJHMP. It includes an overview of existing capabilities, opportunities to strengthen resilience, and the college's prioritized mitigation actions. Together, these elements demonstrate how the college integrates hazard awareness into its planning and development processes while contributing to a coordinated countywide approach.

Within the Napa County MJHMP, the mitigation strategy serves as the roadmap for future hazard mitigation efforts. For the college, the strategy outlined in this annex reflects the outcomes of the countywide planning process while also addressing the college's unique risks, priorities, and community needs. The strategy is designed to reduce vulnerabilities identified in the risk assessment, including the problem statements developed for flooding, earthquakes and liquefaction, slope failure, wildfire, drought, severe storms, extreme heat, and climate change.

Mitigation actions identified in this annex include both policy-based and project-based initiatives, with an emphasis on integrating resilience into land use planning, infrastructure investments, and community programs. Actions are structured to align with FEMA's requirements and to coordinate with existing college, county, and regional planning mechanisms. Each action identifies responsible parties, potential funding sources, and the resources needed for implementation.

For the college, this strategy provides a framework for strengthening resilience by combining office-led initiatives, such as college preparedness, with regional coordination through the MJHMP. By advancing these efforts in local planning documents, Napa Valley College enhances its ability to reduce hazard risk while supporting long-term community safety, sustainability, and economic stability.

The subsections that follow describe these elements in detail:

- **Sections 10.6.1, Capabilities and Opportunities,** provides a summary of NVC's capacity to address natural hazards.
- **Section 10.6.2, Mitigation Action Plan,** presents the college's prioritized actions to guide implementation in coordination with countywide strategies.
- **Section 10.6.3, Status of Previous Mitigation Actions,** provides a summary of all previous actions and their current status, whether completed, cancelled, or revised.

Aligning the Action Plan

This section connects the college's mitigation actions with its existing capabilities and areas for growth. Capability assessments are a required element of hazard mitigation planning under the Disaster Mitigation Act of 2000 and FEMA's 2025 planning guidance, ensuring that actions are realistic, achievable, and aligned with available resources.

The section begins with a summary of the college's capabilities across four areas: planning and regulatory, administrative and technical, fiscal, and education and outreach. This overview highlights the tools and

strengths that the district already uses to reduce hazard risk. The section then provides a detailed analysis of each capability area, identifying both current practices and opportunities to expand resilience.

10.6.1 Capabilities & Opportunities

This section provides a detailed assessment of Napa Valley College's current capabilities to support hazard mitigation, as well as future opportunities. This consists of describing how the college is planning for hazards and growth and a summary of its existing capabilities and the potential for enhancement.

10.6.1.1 Planning for Hazards & Growth

Napa Valley College manages growth and campus development within the framework of state regulations, district planning policies, and institutional capital improvement programs. The main campus in the City of Napa and the satellite campus in St. Helena are largely built out, with future development focused on renovation, modernization, and targeted infill within the existing campus footprint. This pattern of development concentrates facilities, infrastructure, and campus activities in areas that are already subject to natural hazards.

As a result, portions of the College's buildings, infrastructure, and daily population are located in areas exposed to hazards such as flooding near the Napa River, strong earthquake ground shaking, wildfire risk at the wildland urban interface, and extreme heat. Lower-lying areas of the main campus are more susceptible to flooding and drainage constraints, while variations in soil conditions across the site influence seismic response. The St. Helena campus, located in a more rural and vegetated setting, may experience increased exposure to wildfire and access constraints during emergency events.

Hazard vulnerability is addressed through integration of risk considerations into campus planning, facility design, and maintenance practices. Capital improvement projects, facility upgrades, and new construction activities incorporate hazard-resistant design measures, including seismic strengthening, stormwater management improvements, and site-specific engineering considerations. Emergency access, evacuation planning, and continuity of operations are also key components of campus planning to ensure safety and resilience during hazard events.

Climate change is expected to intensify several hazards affecting Napa Valley College, including extreme heat, more intense storm events, prolonged drought, and increased wildfire risk in surrounding areas. As the College continues to modernize and adapt its facilities, resilience is incorporated into planning and investment decisions. Emphasis is placed on sustainable design, efficient water use, infrastructure reliability, and protection of surrounding natural systems to ensure that future improvements reduce risk and support the long-term safety and functionality of the campus.

Building Codes & Development Standards

Building design, construction, and renovation at Napa Valley College are regulated through a state-level framework that emphasizes structural safety, fire and life safety, and accessibility. As a California Community College, the College is subject to oversight by the **Division of the State Architect (DSA)**, which serves as the primary authority for plan review, approval, and construction oversight. The DSA ensures that all campus facilities comply with the requirements of the California Building Standards Code (Title 24), including provisions related to seismic safety, accessibility, and fire protection.

The Structural Safety/Community Colleges (DSA-SS/CC) division is specifically responsible for reviewing construction documents and inspecting projects to verify compliance throughout the design and construction process. This centralized oversight ensures that new buildings and major renovations at Napa Valley College meet rigorous safety standards appropriate for essential public facilities in a seismically active region.

The California Community Colleges Chancellor's Office (CCCCO) plays a complementary role by overseeing capital outlay planning, including the review and approval of district Five-Year Capital Outlay Plans, facility planning efforts, and project funding. This process helps align campus development with statewide priorities and ensures that hazard mitigation considerations are incorporated into long-term facility investment decisions.

Additional state agencies contribute to the regulatory framework. The California Building Standards Commission (CBSC) is responsible for adopting and publishing Title 24, which establishes the building code requirements enforced by DSA. The Office of Public School Construction (OPSC), under the Department of General Services (DGS), supports the administration of state funding programs for educational facilities. The Department of Toxic Substances Control (DTSC) may also be involved in reviewing campus sites for potential environmental hazards during planning and development.

Construction of community college facilities in California is further governed by the Field Act, which requires state oversight to ensure structural integrity and life safety performance. Together, these regulations establish a comprehensive system that promotes resilient design and construction practices. For Napa Valley College, adherence to these standards supports the development and maintenance of facilities that are better equipped to withstand hazards such as earthquakes, fire, and extreme weather, while protecting the safety of the campus community.

California Environmental Quality Act (CEQA) & Hazard Mitigation

Planning, development, and capital improvement projects at Napa Valley College are subject to the California Environmental Quality Act (CEQA), which requires evaluation of potential environmental and hazard-related impacts associated with discretionary projects. For campus facilities, this includes analysis of hazards such as flooding, seismic risk, wildfire exposure, hazardous materials, and other site-specific conditions. Where significant impacts are identified, CEQA requires the incorporation of feasible mitigation

measures, which may include site design modifications, infrastructure improvements, emergency access provisions, or operational controls to reduce risk.

Napa Valley College operates within a broader regulatory framework that integrates multiple state and federal requirements related to hazard mitigation and environmental protection. Key programs informing campus planning and development include the State Seismic Hazards Mapping Act, which identifies areas susceptible to liquefaction and landslides; the California Building Standards Code (Title 24), which establishes structural, fire, and accessibility requirements; and the Federal Emergency Management Agency (FEMA) National Flood Insurance Program, which guides floodplain management and development considerations. Together, these regulations ensure that hazard risks are evaluated and addressed as part of campus planning, design, and construction.

CEQA review for Napa Valley College projects typically occurs in coordination with facility planning and capital improvement efforts. Many campus improvements involve modernization or renovation of existing facilities, which may allow environmental review to tier from prior analyses or utilize streamlined documentation where appropriate. This approach supports efficient project delivery while maintaining compliance with environmental and hazard mitigation requirements.

Recent updates to CEQA practice have also influenced how certain impacts are evaluated. Transportation impacts are now assessed using Vehicle Miles Traveled (VMT) rather than Level of Service (LOS), emphasizing reduction in vehicle travel and associated emissions. In addition, greenhouse gas analysis must align with current regional and state standards, often requiring projects to incorporate measures such as energy-efficient building systems, electrification, and support for alternative transportation.

Through compliance with CEQA and related regulatory programs, Napa Valley College integrates hazard mitigation into its planning and development processes, ensuring that campus improvements reduce risk, enhance resilience, and support the long-term safety of students, faculty, staff, and visitors.

10.6.1.2 Development & Hazard Considerations

Development at Napa Valley College occurs within a physical and regulatory environment shaped by natural hazards, site constraints, and state-level oversight of campus facilities. As a largely built-out institution, the College focuses on modernization, renovation, and targeted infill within its existing campuses in the City of Napa and St. Helena. This pattern of development places campus facilities, infrastructure, and daily operations in areas where natural hazards must be carefully considered and managed.

Portions of the College's campuses are located in proximity to known hazard areas, including flood-prone zones near the Napa River, areas subject to strong seismic shaking and localized liquefaction, and locations exposed to extreme heat and wildfire risk. Rather than avoiding development in these areas, Napa Valley College incorporates risk-informed planning, design, and construction practices to reduce vulnerability and enhance campus resilience.

Flood hazards are addressed through coordination with applicable floodplain management requirements and incorporation of resilient design measures. Campus improvements consider site drainage, stormwater management, and protection of critical infrastructure to reduce the potential for flood-related impacts. Where applicable, design strategies may include elevating or protecting utilities, improving conveyance systems, and minimizing impacts to natural drainage patterns.

Seismic hazards are a primary consideration due to the College's location within a highly active seismic region. All new construction and major renovations are designed in accordance with state seismic safety standards and reviewed through the Division of the State Architect. Site-specific geotechnical conditions, including variations in soil properties across the campus, are evaluated to address risks associated with ground shaking. These measures are intended to reduce structural damage and maintain life safety during earthquake events.

Wildfire exposure, extreme heat, and severe weather are also incorporated into campus planning and operations. The St. Helena campus and vegetated areas surrounding the main campus may experience elevated wildfire risk, while valley conditions can intensify heat exposure. Development and maintenance practices consider defensible space, vegetation management, access for emergency response, and infrastructure resilience to support safe evacuation and continuity of operations.

Through integration of hazard considerations into planning, design, and capital improvements, Napa Valley College seeks to ensure that future development reduces risk, protects campus populations, and supports long-term operational resilience.

10.6.1.3 Capabilities & Opportunities Assessment

To develop a realistic and actionable mitigation strategy, it must account for existing jurisdictional capabilities and what future opportunities there are to enhance those capabilities for purposes of hazard mitigation. This section provides an assessment of the Napa Valley College's existing capabilities and future opportunities, including planning and regulatory, administrative and technical, fiscal, and public outreach and education capabilities. This assessment also identifies opportunities to integrate this MJHMP into future planning, policies, or programs to weave mitigation efforts into daily operations and address hazard problems wholistically. Capabilities are categorized into four groups and include various mechanisms.

- **Planning and Regulatory Capabilities:** Existing long-range plans, emergency response plans, hazard-specific plans, land use policies, and building and development standards.
- **Administrative and Technical Capabilities:** Available expertise in emergency services, engineering, grant management, and community planning.
- **Fiscal Capabilities:** Budgetary capacity, taxing authority, grants, and other funding mechanisms that can support mitigation projects.
- **Outreach and Education Capabilities:** Existing programs for providing technical assistance, community education, public warnings, and stakeholder engagement.

A full description of the process used to develop the capabilities assessment is provided in Volume 1, Section 2.3.3.

This capabilities and opportunities assessment for the college lists the various types of capabilities along with how they have been, currently are, or will in the future be integrated into hazard mitigation planning efforts. The three "HMP Integration" columns that identify the capability's status and usage are color-coded with green, yellow, or orange shading to communicate the following:

- **Status:** If the capability is present at all and what level of use it has generally.
- **Current Mitigation Use:** If the capability is currently being used in mitigation efforts, specifically, and at what level.
- **Future Opportunity:** If there is a future opportunity to integrate the capability into mitigation efforts and at what level.

Summary of Capabilities & Opportunities

This Capabilities and Opportunities Assessment for Napa Valley College summarizes the various types of capabilities it has for hazard mitigation currently. The assessment also identifies opportunities to integrate, expand, and improve the college's capabilities for future hazard mitigation. Table 10-12 provides a comprehensive list of capabilities and identifies the current status, current mitigation use, and future opportunities.

Planning & Regulatory

Napa Valley College operates within a state-regulated framework for facility planning and construction and does not directly regulate land use or development beyond its campus boundaries. The College does not maintain traditional local planning tools such as zoning or subdivision authority; however, it incorporates hazard mitigation into campus planning through capital improvement projects, facility upgrades, and coordination with regulatory agencies.

While the College does not maintain a formal Capital Improvement Program document, it actively advances mitigation through capital planning funded by voter-approved bond measures and state and federal grants. These efforts have supported seismic retrofits, ADA and life safety improvements, and stormwater resilience projects. Additional planning-related activities include coordination with local fire agencies for inspections, participation in regional Community Wildfire Protection Plan efforts, and implementation of sustainability and water conservation practices. Although several formal hazard-specific plans (e.g., flood response, drought contingency, or climate action plans) are not currently adopted, the College integrates hazard considerations into project design, maintenance practices, and campus operations, with opportunities to formalize these efforts in the future.

Future integration of the MJHMP will occur through various processes and mechanisms outlined across multiple mitigation actions (Table 10-13). Key opportunities for future hazard mitigation integration with Napa Valley College's existing planning mechanisms include using the updated risk assessment, hazard-specific vulnerability findings, and projected climate change impacts to inform the All-Hazard Emergency

Response Plan & Drills action (ma-EQ-NVC-41) and the Multi-Hazard Outreach & Alert System action (ma-AH-NVC-229).

Administrative & Technical

Napa Valley College maintains moderate administrative and technical capacity to support hazard mitigation planning and implementation. The College is not an emergency response agency but participates in regional coordination efforts with Napa County and local partners. Technical functions such as engineering design and GIS analysis are primarily supported through contracted services or shared resources, rather than in-house staff.

The College benefits from dedicated staff focused on grant writing and program funding, which strengthens its ability to secure external resources for mitigation and capital improvement projects. Public outreach and education functions are supported through an internal team that provides workshops, safety information, and community engagement, although resources are limited. Overall, this distributed staffing model supports current mitigation activities but presents opportunities to expand technical capacity as climate adaptation and resilience efforts evolve.

Warning Systems & Services

Napa Valley College maintains robust warning and notification capabilities through the NVC SAFE alert system, which delivers emergency notifications via email, text, and social media. This system is used to communicate time-sensitive information related to a wide range of hazards, including flooding, wildfire, earthquakes, and other emergencies.

The College's notification system is coordinated with Napa County alert systems, providing redundancy and improving the reach of emergency communications. This multi-channel approach enhances situational awareness and supports timely protective actions for students, faculty, staff, and visitors across campus.

Fiscal

Napa Valley College has moderate to strong fiscal capacity to support hazard mitigation through bond financing and external funding sources. The College has successfully utilized general obligation bonds to fund major capital improvements, including seismic upgrades, infrastructure modernization, and safety enhancements. These bond revenues are often supplemented by state grants and competitive funding programs.

The College does not rely on local levies, utility fees, or special tax bonds to fund mitigation activities, and it does not maintain formal policies restricting investment in hazard-prone areas. Nevertheless, hazard risk is considered in capital planning decisions, and available funding mechanisms provide a strong foundation for continued investment in resilience and infrastructure improvements.

Education & Outreach

Napa Valley College demonstrates strong education and outreach capabilities that support hazard awareness and preparedness. The College provides hazard-related information through campus safety alerts, educational materials, and periodic workshops addressing risks such as wildfire, drought, flooding, and earthquakes. Outreach is coordinated through Risk Management, the Public Information Officer, and campus safety programs.

The College maintains active social media platforms and communication channels that can be leveraged for hazard education and emergency messaging, although there is an opportunity to expand their use specifically for mitigation outreach. Additional resources, such as printed materials and compliance-related notifications, are distributed through campus police and safety programs. While formalized outreach programs and dedicated hazard information hubs are limited, existing efforts provide a strong foundation for expanding public engagement and preparedness initiatives in the future.

ASSESSMENT LEGEND

HMP Integration

Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Table 10-12: Napa Valley College Capabilities and Opportunities Assessment

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Planning and Regulatory Capabilities				
Hazard Reduction Programs (Annually Conducted)				
Capital Improvements Program (CIP) or Plan				Does not maintain a formal CIP document but engages in capital project planning through the Measure E bond program and competitive state/federal grants. Projects include seismic retrofits, stormwater resilience (e.g., recharge basins), and utility upgrades.

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Annual Fire Prevention Plan				Facilities Services conducts regular fire safety inspections and coordinates with local fire agencies but does not maintain a formal fire mitigation plan.
Seismic Safety Program (Non-structural)				Some seismic mitigation (e.g., bracing equipment, safety signage) is implemented, but no formal non-structural seismic program exists.
Earthquake Modernization Plan (Building Safety)				Major building upgrades and retrofits are underway with some completed through Measure E funding, with full compliance to seismic code and ADA/Life Safety improvements.
Stormwater Management Program (Annual Inspections)				
Hazard Plans and Programs				
Floodplain Response Plan				No formal flood response plan is in place, and NVC does not lead emergency response for flood events. However, the College contributes to pre-disaster mitigation by integrating stormwater improvements (e.g., recharge basins, drainage upgrades) into capital projects.
Community Wildfire Protection Plan (CWPP)				While NVC is not a lead agency, it participates in local CWPP implementation through coordination with CAL FIRE and County OES, and supports defensible space, fuel break, and vegetation management on campus grounds.
Ground Water Management Planning / Plans				Not within the College's jurisdiction. Groundwater management planning is led by other agencies; however, NVC supports stormwater recharge through facility design.
Climate Action Plan				No formal CAP is adopted, but the College contributes to regional resilience goals via its Sustainability Committee, which supports forest health, water conservation, and reduced campus emissions.
Drought Mgmt/ Contingency Plan				NVC does not have a formal drought contingency plan but actively implements drought resilience strategies, including greywater reuse, efficient irrigation, and coordination with local water agencies.

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
FireWise Communities within District				Napa Valley College is not formally recognized as part of a Firewise Community, but the College partners with local fire agencies and implements defensible space and vegetation management practices consistent with Firewise principles.
Hazard-Related Public Outreach Program				The College provides hazard education through emergency preparedness materials, campus safety alerts, and occasional workshops related to wildfire, drought, seismic, and flood risks. Outreach is coordinated through Risk Management and the Public Information Officer.
Administrative and Technical				
Staff Capacity				
Emergency Manager				Not an emergency response agency, but participates in regional coordination efforts
Civil Engineer				Does not employ in-house civil engineering staff; secures engineering design services through competitive vendor contracts for specific projects (e.g., Wine Education Center Phase II)
Dedicated Public Outreach Personnel				Outreach/education team supports workshops, public information distribution, and community partnerships; resource-limited but active
GIS Specialist and Capability				GIS functions are either shared or consultant-supported
Grant Manager, Writer, or Specialist				Dedicated staff focused on grant writing and program funding
Other	N/A	N/A	N/A	
Warning Systems/Services				
General				Employs the NVC SAFE alert system, delivering emergency notifications, official notices, and updates via email, text, and social media, in coordination with Napa County's alters.
Flood				NVC SAFE
Wildfire				NVC SAFE
Geological Hazards				NVC SAFE
Fiscal Capabilities				
Financial Resources for Hazard Mitigation				

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Levy for Specific Purposes with Voter Approval				NVC does not rely on parcel taxes or other local levies approved directly by voters for funding service or mitigation programs.
Utilities Fees	N/A	N/A	N/A	Not a utility provider
System Development Fee	N/A	N/A	N/A	Does not provide utility or other applicable services outside campus
General Obligation Bonds to Incur Debt				NVC issues GO bonds (e.g., from 2002 and 2018 elections), which have financially supported seismic upgrades, capital improvements, and infrastructure investments.
Special Tax Bonds to Incur Debt				NVC does not use special tax bonds as a financing mechanism.
Withheld Spending in Hazard-Prone Areas				No formal policy withholding spending; capital decisions may consider risk but no documented mitigation policy.
Stormwater Service Fees	N/A	N/A	N/A	Does not provide stormwater services outside campus
Capital Improvement Project Funding				Bond revenues, supplemented with state grants, fund many capital projects including safety and resilience upgrades
Education / Outreach Capabilities				
Education/Outreach Resources				
Website Dedicated to Hazard Topics				No dedicated hazard website or dashboard, but educational materials available; future opportunity
Dedicated Social Media				NVC maintains active social media accounts across Facebook, Instagram, LinkedIn, YouTube, and TikTok, but use for mitigation could be expanded.
Hazard Info. Avail. at Library/ Planning Desk				No dedicated hazard information center or desk, but educational materials available
Annual Public Safety Events				No annual public safety events / fairs currently hosted, but workshops provided irregularly
Ability to Field Public Tech. Assistance Requests				NVC Risk Management coordinates internal compliance training and hazard awareness initiatives via Keenan Safe Colleges platform, and hazard education is provided for wildfire, drought, seismic, and flood risks via the Public Information Officer, but no dedicated technical assistance currently.
Public Safety Newsletters or Printed Outreach				Informational materials and bulletins are issued by college police as part of Clery Act compliance and safety updates.

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Fire Safe Councils				No formal partnerships with Fire Safe Council, but College partners with local fire agencies and implements Firewise principles.
Resource Conservation Districts				No formal partnership with Napa County RCD but future opportunity
Other	N/A	N/A	N/A	

10.6.2 Napa Valley College Mitigation Action Plan

The college's mitigation actions were developed through a collaborative process informed by the updated risk assessment, local priorities, and extensive stakeholder engagement. As part of this 2026 MJHMP update, the office reviewed mitigation actions from its prior Local Hazard Mitigation Plan to determine which actions to carry forward, which to consolidate, and where entirely new strategies were required. This careful evaluation ensured that the updated action plan builds upon past commitments while also responding to current risks and future challenges.

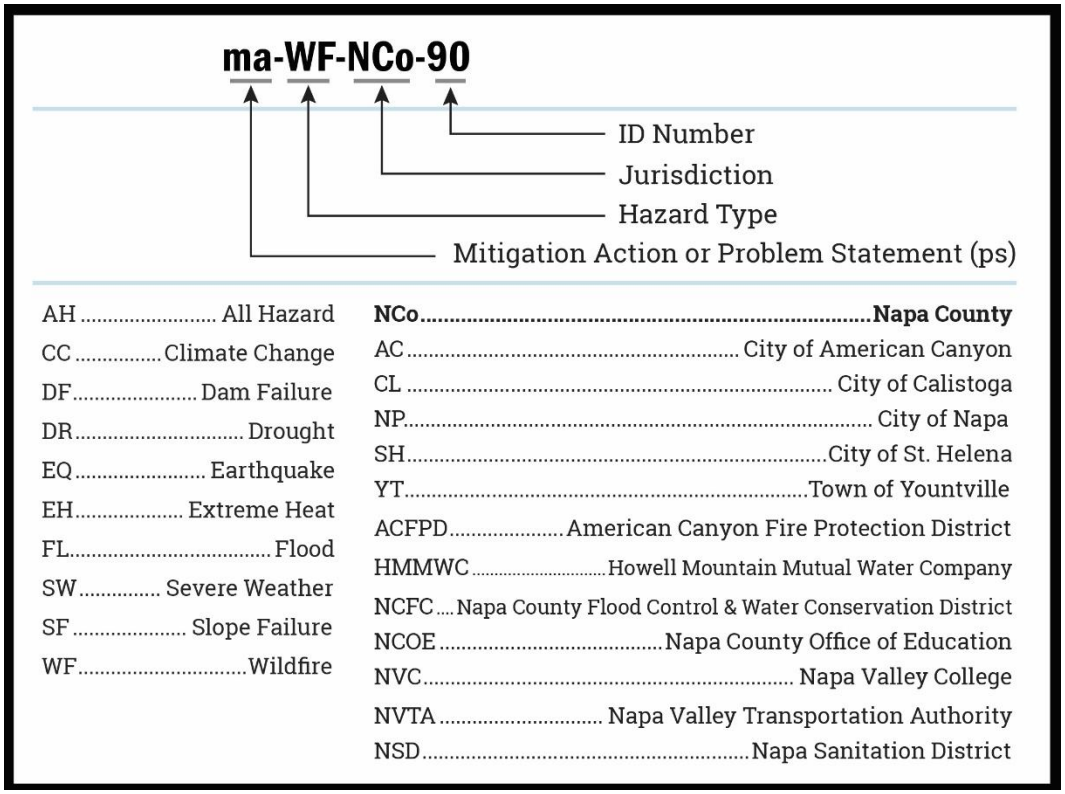


Figure 10-19: Mitigation Action Number Key

The plan addresses the college's most significant hazards, including wildfire, earthquake, flood, slope failure, drought, dam failure, and extreme weather. Each mitigation action is designed to align with FEMA's hazard mitigation guidance and the requirements of the Disaster Mitigation Act of 2000. Where appropriate, overlapping or redundant actions were consolidated into broader, more comprehensive strategies that improve clarity, increase feasibility, and strengthen regional coordination.

The mitigation action prioritization method used by all participating jurisdictions is described in Volume 1, Section 4. Each action specific to the college is documented in Table 10-13, which identifies the responsible department, implementation timeframe, potential funding sources, and resources required to complete the action. Each action is also assigned a unique alphanumeric identifier (see Figure 10-19) that links the strategy to its associated hazard and supports consistent monitoring and reporting.

The college's approach recognizes that some hazards are most effectively addressed through regional efforts. Flood protection, drought resilience, and wildfire risk reduction often extend beyond the college's boundaries and require collaboration with county, regional, and state partners. By aligning local actions with regional strategies, the college helps to consolidate resources, maximize funding opportunities, and ensure

that mitigation projects achieve the greatest benefit for San Pablo Bay, the Napa Valley, and the wider Napa County community.

Collectively, these mitigation actions provide a roadmap for reducing hazard risk, protecting vulnerable populations, and strengthening the long-term resilience of the college.

Table 10-13: Napa Valley College Mitigation Action Plan

Mitigation No.	Hazard Type	Sub-Hazard	Mitigation Type	Year	Primary Agency	Title	Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Problem Statements
ma-AH-NVC-41	All Hazard		PRV - Prevention , PE&A - Public Education & Awareness , ES - Emergency Services	2020	Napa Valley College	All-Hazard Emergency Response Plan & Drills	Develop and maintain a campus-specific emergency response plan for all hazards, including evacuation routes, shelter locations, mutual aid, and continuity of instruction under a range of likely scenarios including earthquake, flood or dam failure, and wildfire. Conduct EOC staff training and drills with faculty and students.	Operations Staff	Low	Medium	1-3 Years	Capacity / Capability Building	HMGP / BRIC , General Fund	High	ps-EQ-NVC-84, ps-EQ-NVC-76, ps-EQ-NVC-83
ma-AH-NVC-229	All Hazard		PE&A - Public Education & Awareness , ES - Emergency Services	2026	Napa Valley College	Multi-Hazard Outreach & Alert System	Upgrade mass notification systems and building alarm systems in coordination with the county to ensure rapid and accurate communication during any hazard scenarios. Develop an annual outreach and education campaign to spread awareness of hazard risks, preparedness, and on-campus emergency procedures to faculty and students.	Administration	High	Medium	1-3 Years	Capacity / Capability Building	HMGP / BRIC , General Fund	High	ps-DR-NVC-354, ps-EQ-NVC-84, ps-FL-NVC-126, ps-EH-NVC-351, ps-SW-NVC-150, ps-WF-NVC-348
ma-AH-NVC-231	All Hazard		SP - Structural Projects	2026	Napa Valley College	Back-Up Power Expansion	Install back-up power for critical facilities and systems and test power back-ups annually.	Facilities Maintenance	High	High	1-3 Years	Project	HMGP / BRIC , General Fund	Medium	ps-WF-NVC-356, ps-SW-NVC-350, ps-EH-NVC-352, ps-EQ-NVC-83
ma-DR-NVC-230	Drought		NRP - Natural Resource Protection , SP - Structural Projects	2026	Napa Valley College	Drought-Resilient Rec Fields & Landscaping	Replace non-functional, high-water turf grass areas with native drought-tolerant landscaping and replace heavily used grass recreation fields with drought-tolerant turf. Modernize landscaping and rec field irrigation systems around campus with weather-based controls and soil moisture sensors.	Grounds Staff	High	Medium	3-5 Years	Project	HMGP / BRIC , General Fund	Medium	ps-DR-NVC-353, ps-DR-NVC-354, ps-DR-NVC-355
ma-EQ-NVC-42	Earthquake		PPRO - Property Protection	2020	Napa Valley College	Seismic Design & Retrofit of Critical Facilities	Conduct seismic evaluations and retrofit vulnerable facilities, with a priority on pre-1970s buildings and those on soft soils. Design and construct all new critical facilities to exceed minimum seismic standards, especially those that may serve as emergency shelters or critical infrastructure.	Facilities Maintenance	High	High	3-5 Years	Project	HMGP / BRIC , General Fund	High	ps-EQ-NVC-85
ma-EH-NVC-233	Extreme Heat		NRP - Natural Resource Protection , SP - Structural Projects	2026	Napa Valley College	Heat Island Reductions		Grounds Staff, Facilities Maintenance	High	Medium	3-5 Years	Project	HMGP / BRIC , General Fund	Medium	ps-EH-NVC-352, ps-EH-NVC-351
ma-FL-NVC-68	Flood		NRP - Natural Resource Protection , SP - Structural Projects	2013	Napa Valley College	Grounds Team Training in Drainage Infrastructure Maintenance	Provide the grounds team enhanced training for conducting inspections, cleaning, assessing, and repairing or replacing stormwater drainage infrastructure to prevent blockages and erosion. Include instruction on identifying problem areas and integrating BMPs, green infrastructure, and other enhancements.	Facilities Maintenance, Grounds Staff	Medium	High	1-3 Years	Capacity / Capability Building	HMGP / BRIC , General Fund	Medium	ps-FL-NVC-126, ps-FL-NVC-127, ps-SW-NVC-349, ps-SW-NVC-146
ma-SW-NVC-232	Severe Weather	High Wind	NRP - Natural Resource Protection	2026	Napa Valley College	Tree Canopy Management	Inventory and assess high-risk trees across campus every five years and establish an annual canopy management schedule for pruning, stabilization, and removal and replacement, especially along travelways and around buildings.	Grounds Staff	Medium	High	3-5 Years	Capacity / Capability Building	HMGP / BRIC , General Fund	Medium	ps-SW-NVC-150, ps-SW-NVC-349, ps-SW-NVC-350

Mitigation No.	Hazard Type	Sub-Hazard	Mitigation Type	Year	Primary Agency	Title	Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Problem Statements
ma-WF-NVC-126	Wildfire		PPRO - Property Protection , NRP - Natural Resource Protection	2020	Napa Valley College	Implement WUI Risk Reduction Measures	Conduct vegetation management, create defensible space, and install ignition-resistant building features in WUI-adjacent areas of campus to reduce wildfire and post-fire hazard exposure.	Facility Maintenance	Medium	High	1-3 Years	Project	HMGP / BRIC , General Fund , CalFIRE	High	ps-WF-NVC-180, ps-WF-NVC-180
ma-WF-NVC-228	Wildfire		PPRO - Property Protection	2026	Napa Valley College	Enhance Indoor Air Quality Protection	Install and maintain high-efficiency filtration systems and portable air purifiers to mitigate wildfire smoke impacts and update operational protocols for smoke events.	Facilities Maintenance	High	High	3-5 Years	Project	HMGP / BRIC , General Fund	Medium	ps-WF-NVC-348, ps-WF-NVC-180, ps-EH-NVC-352

10.6.3 Status of Previous Mitigation Actions

In 2020, Napa Valley College adopted its previous FEMA-approved HMP. This 2026 MJHMP represents a comprehensive update from that previous plan, as discussed in Volume 1, Section 1.5. Table 10-14 provides status updates for all of the previous mitigation actions in the college's annex from 2020, from which many of the mitigation actions in Table 10-13 were sourced and revised.

Table 10-14: Napa Valley College Status of Previous Mitigation Actions

Mitigation No.	Hazard Type	Status	Year	Primary Agency	Title/Description	Reason Cancelled/ Completed
ma-EQ-NVC-41	Earthquake	Ongoing	2020	Napa Valley College	All-Hazard Emergency Response Plan & Drills	Revised
ma-EQ-NVC-42	Earthquake	Ongoing	2020	Napa Valley College	Seismic Design & Retrofit of Critical Facilities	Revised
ma-FL-NVC-68	Flood	Ongoing	2013	Napa Valley College	Grounds Team Training in Drainage Infrastructure Maintenance	Revised
ma-WF-NVC-126	Wildfire	Ongoing	2020	Napa Valley College	Implement WUI Risk Reduction Measures	Revised
ma-EQ-NVC-43	Earthquake	Cancelled	2013	Napa Valley College	Research geological soil makeup of lower tier of campus to determine if additional structural mitigation steps are necessary.	NVC-04-2020 & NVC-05-2013 combined and revised
ma-FL-NVC-110	Flood	Cancelled	2020	Napa Valley College	Storm water collection location check valves	NVC-01-2013, NVC-07-2020 & NVC-206-2020 combined and revised
ma-SW-NVC-125	Severe Weather	Cancelled	2020	Napa Valley College	Perform a feasibility study for flood proofing options and analyze the drainage systems on campus.	NVC-01-2013, NVC-07-2020 & NVC-206-2020 combined and revised

Napa County

Multi-Jurisdictional Hazard Mitigation Plan Update

2026

Section 11. Napa Valley Transportation Authority

VOLUME 2
JURISDICTIONAL ANNEXES

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Napa County

2026 Multi-Jurisdictional Hazard Mitigation Plan Update

Napa Valley Transportation Authority (NVTA)

Special Agency Annex

Section 11. Napa Valley Transportation Authority 11-7

11.1 Scope & Purpose 11-7

11.2 Jurisdictional Setting 11-7

11.2.1 Geography & Climate 11-9

11.2.2 Demographics & Vulnerable Populations 11-12

11.2.3 Economy 11-20

11.2.4 Growth Trends & Future Development 11-21

11.3 Planning Process 11-23

11.3.1 Public Input & Draft Review 11-25

11.4 What's New 11-26

11.4.1 Mitigation Activities 11-26

11.4.2 Mitigation Successes 11-27

11.5 Risk Assessment 11-31

11.5.1 Hazard Screening & Prioritization 11-32

11.5.2 Vulnerability to Specific Hazards 11-36

11.5.3 Climate Change Impacts & Vulnerable Populations 11-52

11.5.4 Hazard Problem Statements 11-53

11.6 Mitigation Strategy 11-55

11.6.1 Capabilities & Opportunities 11-56

11.6.2 Napa Valley Transportation Authority Mitigation Action Plan 11-66

List of Figures

Figure 11-1: NVTA Geographic Overview Map 11-11
Figure 11-2: VineGo Paratransit Shuttle 11-29
Figure 11-3: Ribbon Cutting new at the new Vine Transit Maintenance Facility 11-30
Figure 11-4: NVTA Risk Assessment Matrix 11-34
Figure 11-5: NVTA Wildfire Risk 11-39
Figure 11-6: NVTA Earthquake Risk (M7.1 Hunting Creek–Berryessa) 11-42
Figure 11-7: NVTA Earthquake Risk (M6.7 West Napa) 11-43
Figure 11-8: NVTA Flood Risk (FEMA and DWR Awareness Zones) 11-46
Figure 11-9: NVTA Landslide Susceptibility 11-49
Figure 11-10: Mitigation Action Number Key 11-66

List of Tables

Table 11-1: Napa County Income and Poverty 11-15
Table 11-2: Napa County Renter- and Owner-Occupied Housing 11-15
Table 11-3: Napa County Households with Seniors 11-16
Table 11-4: Napa County Households with Children 11-17
Table 11-5: Napa County Population with Disabilities and Access to Transportation 11-18
Table 11-6: Napa County Household Languages 11-19
Table 11-7: NVTA Planning Team and Steering Group Members 11-23
Table 11-8: NVTA Planning Team Meetings 11-25
Table 11-9: NVTA Document Review of Potential Hazards 11-33
Table 11-10: NVTA Hazards Prioritization Summary 11-35
Table 11-11: NVTA Facilities Wildfire Exposure 11-38
Table 11-12: NVTA Linear Infrastructure Wildfire Exposure 11-38
Table 11-13: NVTA Facilities Earthquake Risk (M7.1 Hunting Creek–Berryessa) 11-41
Table 11-14: NVTA Linear Assets Earthquake Risk (M7.1 Hunting Creek–Berryessa) 11-41
Table 11-15: NVTA Facilities Earthquake Risk (M6.7 West Napa) 11-41
Table 11-16: NVTA Linear Assets Earthquake Risk (M6.7 West Napa) 11-41
Table 11-17: NVTA Linear Asset in FEMA Flood Zones 11-47
Table 11-18: NVTA Facilities in FEMA Flood Zones 11-47
Table 11-19: NVTA Linear Assets in Landslide Susceptibility Zones 11-48
Table 11-20: NVTA Facilities in Landslide Susceptibility Zones 11-48
Table 11-21: NVTA Hazard Problem Statements 11-53
Table 11-22: NVTA Capabilities and Opportunities Assessment 11-62
Table 11-23: NVTA Mitigation Action Plan 11-68

Adoption Resolution

To comply with the Federal Disaster Mitigation Act of 2000 (DMA 2000), the Napa Valley Transportation Authority Board of Directors has officially adopted this 2026 Napa County Multi-Jurisdictional Hazard Mitigation Plan, including Volume 1 in its entirety as well as this Volume 2 municipal annex. The adoption of the MJHMP recognizes the district's commitment to reducing the impacts of natural hazards within its jurisdiction and across Napa County.

A copy of the district's adoption record is provided on the following pages. Adoption records for all jurisdictions are summarized in Volume 1, Table ES-1.

ADOPTION RECORD TO BE INSERTED UPON COMPLETION.

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Section 11. Napa Valley Transportation Authority

11.1 Scope & Purpose

This Jurisdictional Annex for the Napa Valley Transportation Authority (NVTA) of the 2026 Napa County Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) details the hazard mitigation planning elements specific to the district's planning area. The annex is not intended to be a standalone document but appends to and supplements the information contained in the umbrella plan document (Volume 1). As such, all sections of the umbrella plan, including the planning process and other procedural requirements, apply to and were met by the district. This annex provides additional information specific to the district, with a focus on hazard identification and risk assessment, vulnerability assessment, problem statements, mitigation strategy, and capabilities assessment. Below are NVTA's Points of Contact:

Primary Point of Contact	Alternate Point of Contact
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11.2 Jurisdictional Setting

The Napa Valley Transportation Authority (NVTA) serves as the designated county-wide transportation planning agency for Napa County and is responsible for coordinating the development, funding, and implementation of transportation programs, projects, and policies throughout the Napa Valley. NVTA functions as both a transportation planning authority and a transit operator through its management of Vine Transit, the county's public transit system.

NVTA's jurisdiction encompasses the entirety of Napa County, including the incorporated Cities of American Canyon, Calistoga, Napa, and St. Helena, the Town of Yountville, and the unincorporated areas of Napa County. This responsibility positions NVTA as a central coordinating entity linking local transportation needs with regional transportation strategies.

NVTA plays a critical role in connecting Napa County's transportation system to broader regional planning frameworks led by the Metropolitan Transportation Commission (MTC). The Countywide Transportation Plan was developed as part of the regional planning process that culminates in Plan Bay Area, ensuring that Napa County's transportation investments align with regional mobility, safety, and sustainability objectives. This regional integration is particularly significant from a hazard mitigation perspective, as many natural

hazards affecting Napa County, including wildfire, earthquake, and flooding, do not conform to jurisdictional boundaries.

Congestion Management Agencies were established statewide following the passage of Proposition 111 by California voters in 1990. Proposition 111 increased the state fuel tax and required urban counties to designate a Congestion Management Agency responsible for coordinating transportation planning, programming, and congestion management activities. Within Napa County, NVTA fulfills this statutory role by managing transportation funding programs, developing long-range transportation plans, and coordinating investments that support mobility, safety, and system performance.

NVTA operates as both a planning and funding authority. The agency receives and administers a variety of funding sources, including state transportation funds, federal Surface Transportation Program (STP) funds, Transportation Development Act (TDA) funds, and other revenues apportioned to urbanized areas. As a designated federal Transportation Management Area (TMA), NVTA is responsible for complying with additional federal planning and programming requirements while benefiting from access to federal transportation funding programs. This designation further reinforces NVTA's role as Napa County's primary conduit for transportation funding and regulatory coordination.

Beyond traditional transportation planning functions, NVTA administers several specialized programs tied to broader public policy objectives. As program manager for the Transportation Fund for Air Quality, NVTA supports projects and strategies designed to reduce vehicle emissions and improve regional air quality. NVTA also coordinates Transportation Development Act (TDA) funds in partnership with the Metropolitan Transportation Commission, ensuring that resources are allocated to transit, paratransit, streets and roads, and bicycle and pedestrian improvements. Additionally, NVTA serves as the Abandoned Vehicle Abatement Authority, administering funds derived from vehicle registration fees to address abandoned vehicles and related community impacts.

In addition to its planning functions, NVTA manages and operates essential elements of the county's public transportation network. Through Vine Transit, Napa County's public transit system, NVTA provides fixed-route transit services and ADA-mandated paratransit services that support daily mobility, access to employment, and transportation for vulnerable populations. NVTA also oversees transit-related infrastructure, including fleet assets, maintenance facilities, administrative facilities, and supporting systems necessary for transit operations.

The scale of the countywide roadway network further illustrates the breadth of NVTA's planning environment. Napa County contains more than 1,500 miles of roads, many of which are subject to ongoing maintenance and rehabilitation needs. This extensive network must accommodate local travel, regional commuting patterns, freight movement, and significant visitor traffic associated with Napa Valley's tourism economy.

Napa Valley's economic profile further shapes transportation system demands. The region's economy is strongly influenced by agriculture, tourism, hospitality, and related industries, which generate distinct travel patterns and seasonal traffic fluctuations. The Vision Zero Action Plan notes that nearly four million visitors travel to Napa Valley annually, producing significant traffic volumes and complex interactions

between local and regional travel. These conditions affect roadway congestion, evacuation planning, transit operations, and overall system resilience.

NVTA's location within Napa County and the State of California are shown in Figure 11-1.

- **Year of Incorporation:** 1998
- **Populations Served:** ~137,381 (US Census Bureau, 2022)
- **Primary Services:** NVTA provides countywide transportation planning, programming and funding administration, and operates public transit services through the Vine Transit system.

11.2.1 Geography & Climate

NVTA operates within Napa County, a region defined by its distinctive geographic features and Mediterranean climate, both of which strongly influence transportation infrastructure, system performance, and hazard vulnerability. Napa County is characterized by a long, narrow valley oriented in a northwest–southeast direction, bounded by mountain ranges that shape development patterns, travel corridors, and environmental conditions. Napa Valley is a predominantly rural and agricultural region, where communities are largely concentrated along the Valley floor and connected by a limited number of primary transportation corridors.

The Valley floor serves as the primary location for urban development, transportation facilities, and major roadway infrastructure. Key travel routes, including State Route 29 and Silverado Trail, run longitudinally through the valley and function as critical mobility corridors for residents, employees, freight movement, and visitors. Surrounding the Valley floor are rolling hills and mountainous terrain, which introduce topographic constraints affecting roadway alignments, sight distances, evacuation routes, and infrastructure siting. These geographic conditions contribute to a transportation system that is highly corridor-dependent, where disruptions along major routes may have widespread system impacts.

Hydrologic features further shape Napa County's geography and associated transportation risks. The Napa River and its tributaries traverse the Valley floor, creating areas subject to periodic flooding, localized drainage challenges, and erosion-related impacts. Seasonal storm events can affect roadway operations, transit reliability, and infrastructure integrity, particularly in low-lying areas or locations adjacent to creeks and waterways. Transportation infrastructure must therefore be designed and maintained with consideration for both flood hazards and long-term watershed dynamics.

Napa County's climate is generally classified as Mediterranean, characterized by warm, dry summers and cool, wet winters. The Countywide Transportation Plan acknowledges that the region experiences distinct seasonal variability, including concentrated precipitation during winter months and extended dry periods during summer. This climatic pattern contributes to several transportation-relevant hazard conditions. Winter storms may produce heavy rainfall, localized flooding, debris flows, and reduced roadway visibility, while prolonged dry seasons contribute to elevated wildfire risk, heat-related stress on infrastructure, and increased likelihood of drought conditions.

Wildfire represents one of the most significant climate-influenced hazards affecting Napa County. The combination of seasonal drought, high summer temperatures, low humidity, and wind-driven fire behavior

creates conditions conducive to large wildfire events. Transportation networks frequently serve as both evacuation routes and operational lifelines during wildfire incidents, making roadway reliability, traffic management, and transit continuity critical resilience considerations. Wildfire impacts may include roadway closures, reduced visibility from smoke, damage to transportation assets, and interruptions to power and communication systems supporting transit operations.

Temperature variability also influences transportation system performance. High summer temperatures may contribute to pavement degradation, increased vehicle breakdowns, and operational challenges for both transit fleets and passengers. Conversely, winter conditions, while generally mild compared to other regions, can introduce reduced traction, localized icing in elevated areas, and storm-related hazards affecting roadway safety.

Climate change considerations are increasingly relevant to Napa County's transportation planning environment. Regional planning documents recognize that changing temperature patterns, altered precipitation intensity, and increasing frequency of extreme weather events may amplify existing hazards, including wildfire, flooding, and heat-related impacts. These evolving conditions require transportation agencies such as NVTA to incorporate resilience and adaptation strategies into long-range planning, capital investment decisions, and operational policies.

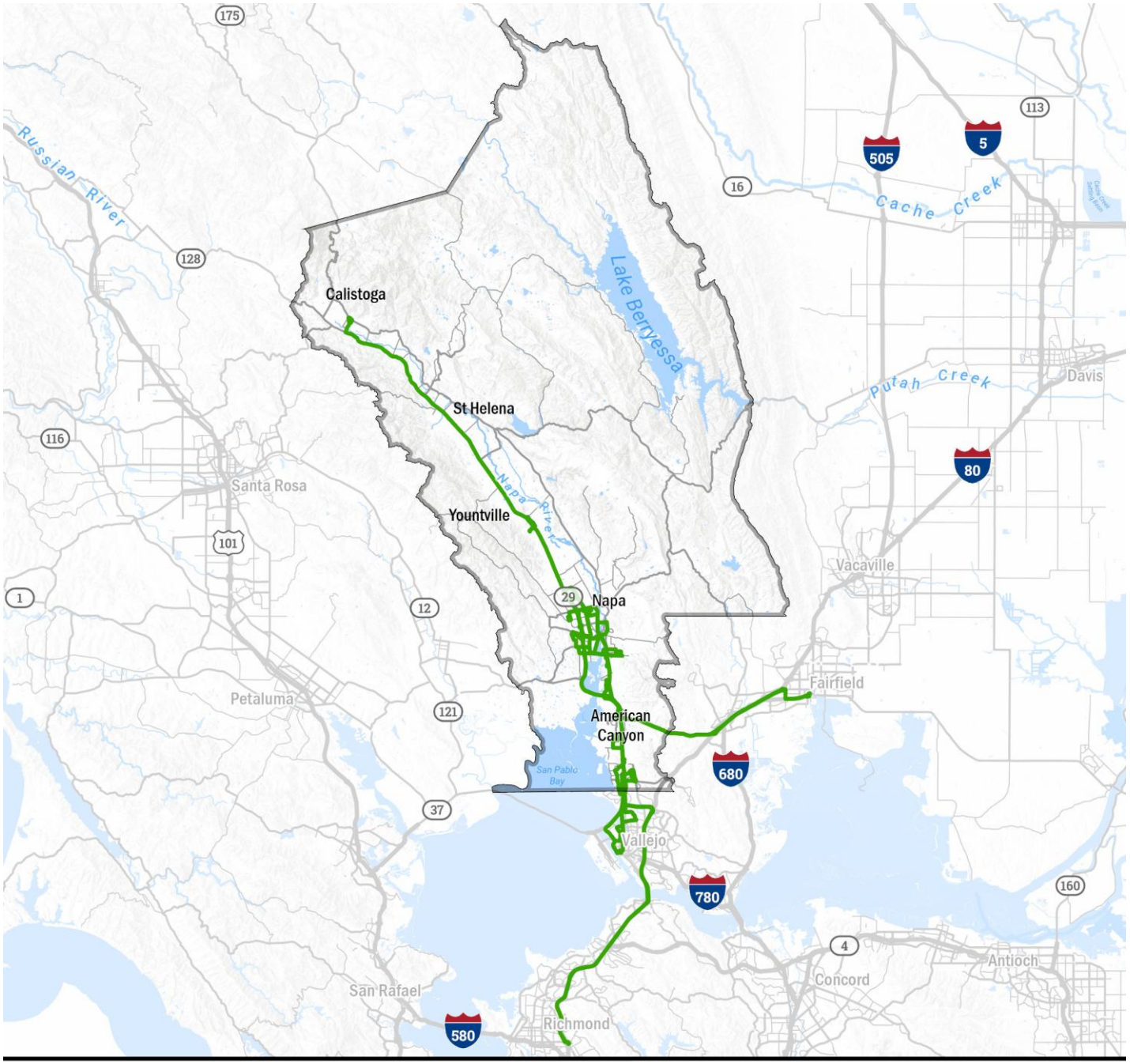


Figure 11-1: NVTA Geographic Overview Map

11.2.2 Demographics & Vulnerable Populations

NVTA serves a population whose demographic characteristics significantly influence transportation needs, system design, and hazard vulnerability. Napa County's population profile differs from many other Bay Area counties, particularly in terms of age distribution, disability prevalence, and the geographic distribution of transit-dependent residents.

According to the Accessible Transportation Needs Assessment (ATNA), Napa County has one of the highest proportions of older adults within the San Francisco Bay Area. The ATNA notes that Napa County has the second-highest percentage of residents over the age of 65 among Bay Area counties, exceeded only by Marin County. This age distribution has direct implications for transportation planning and hazard mitigation. Older adults are more likely to rely on public transportation services, paratransit, and community-based mobility programs, while also facing increased physical vulnerability during hazard events. (NVTA ATNA, 2025)

The ATNA further identifies that Napa County has the second-highest percentage of individuals with disabilities in the Bay Area, exceeded only by Solano County. Individuals with disabilities often experience heightened transportation challenges, including dependence on accessible transit services, greater sensitivity to service disruptions, and increased difficulty during emergency evacuations. These conditions reinforce NVTA's role not only as a transportation provider but also as a critical lifeline agency during hazard events. (NVTA ATNA, 2025)

Vulnerable populations within Napa County extend beyond age and disability classifications. The Community-Based Transportation Plan (CBTP) highlights the presence of Equity Priority Communities (EPCs), defined by the Metropolitan Transportation Commission as census tracts with concentrations of populations that may experience disproportionate transportation burdens. These include low-income households, communities of color, seniors, individuals with disabilities, residents with limited English proficiency, households without access to private vehicles, and other historically underserved groups. (NVTA CBTP, 2025)

Within Napa County, both regionally designated and locally identified EPCs reflect areas where residents may be more dependent on public transportation services and more vulnerable to transportation disruptions. The CBTP identifies multiple EPCs distributed across the City of Napa, Calistoga, St. Helena, American Canyon, and unincorporated communities. Residents within these communities often face transportation barriers related to cost, service frequency, physical infrastructure limitations, and geographic accessibility. During hazard events, these barriers may be amplified by roadway closures, transit interruptions, or power outages affecting transportation operations.

Transit-dependent populations represent a particularly important consideration for NVTA's hazard mitigation planning. Many residents rely on Vine Transit services for access to employment, healthcare, education, and essential services. Disruptions affecting transit operations, including fleet availability,

fueling or charging infrastructure, communications systems, or roadway access, may therefore produce disproportionate impacts on vulnerable groups.

NVTA administers several specialized mobility programs designed to expand transportation access for seniors and individuals with disabilities beyond traditional fixed-route transit service. The Shared Vehicle Program provides qualifying nonprofit 501(c)(3) organizations that serve elderly individuals and persons with disabilities with access to NVTA-owned vehicles, enabling partner agencies to deliver client transportation services. Under this program, participating organizations supply qualified drivers, fuel, and required insurance coverage, while NVTA provides the vehicles, performs driver screening, delivers training, and maintains the fleet. This arrangement allows community-based organizations to enhance mobility services without the capital costs associated with vehicle ownership.

Complementing this program, the Taxi Scrip Program functions as a subsidized lifeline service for eligible City of Napa residents who are seniors 65+ or persons with disabilities. The program is designed to supplement, rather than replace, regular Vine Transit service by providing reduced-cost taxi trips within the City of Napa for circumstances when fixed-route transit may be unavailable or impractical, such as evening travel or health-related limitations. NVTA subsidizes up to up to 50% of the first $18 of the cab ride fare of each trip cost, thereby improving flexible, on-demand mobility for eligible participants.

Additionally, VineGo Paratransit Service provides ADA-compliant, shared-ride, curb-to-curb transportation for certified individuals whose disabilities prevent them from independently using the fixed-route bus system. VineGo operates within three quarters of a mile to the fixed-route network, ensuring that individuals with mobility limitations retain access to essential destinations, services, and community resources. Collectively, these programs play a critical role in advancing transportation equity, accessibility, and system resilience throughout Napa County.

Visitors and seasonal workforce populations also contribute to Napa County's demographic landscape. Napa Valley's tourism-driven economy attracts millions of visitors annually, while agricultural and hospitality industries generate commuting patterns involving employees traveling from surrounding counties. These populations increase overall system demand and introduce additional complexity during emergencies, particularly when evacuation or sheltering actions are required.

From a hazard mitigation perspective, vulnerable populations are often more sensitive to transportation system disruptions. Older adults, individuals with disabilities, low-income households, and residents without private vehicles may experience greater difficulty accessing emergency information, securing alternative transportation, or adapting to extended service interruptions. Transportation infrastructure and services therefore play a critical role in supporting community resilience, enabling evacuation, facilitating emergency response, and maintaining access to essential destinations.

11.2.2.1 Income & Housing

Income and housing conditions within Napa County play an important role in shaping transportation needs and vulnerability for populations served by the NVTA. Napa County is characterized by a high cost of living

driven largely by housing affordability pressures, which have direct implications for transportation access and travel behavior. Regional and county planning documents consistently note that housing costs consume a disproportionate share of household income for many residents, particularly low-income households, seniors on fixed incomes, and service-sector workers employed in Napa Valley's tourism and agricultural economy.

The Community-Based Transportation Plan (CBTP) identifies numerous Equity Priority Communities (EPCs) where residents are more likely to be low income, cost-burdened by housing expenses, and dependent on public transportation. These communities include areas within the City of Napa, Calistoga, St. Helena, American Canyon, and select unincorporated areas. In many cases, rising housing costs have pushed lower-income households farther from employment centers and essential services, increasing reliance on transit, shared mobility, and demand-responsive transportation programs.

Housing patterns in Napa County are also geographically constrained by agricultural land preservation policies, environmental protections, and limited developable land. As a result, new housing supply has not kept pace with demand, contributing to affordability challenges and longer commute distances for many workers. The Countywide Transportation Plan acknowledges that a significant share of the local workforce commutes into Napa County from surrounding counties, reflecting a mismatch between housing availability and employment locations. These commuting patterns place additional strain on regional transportation corridors and increase vulnerability to service disruptions during hazard events.

Income and housing insecurity can compound transportation vulnerability during emergencies. Households with limited financial resources or unstable housing are less likely to have access to private vehicles, alternative transportation options, or flexible work arrangements. During wildfires, floods, or severe weather events, these populations may depend heavily on public transit, paratransit, and community-based transportation services for evacuation, access to shelters, and recovery-related travel. Transportation disruptions therefore have the potential to disproportionately affect residents already experiencing economic and housing-related stress.

NVTA's planning and funding programs directly intersect with these conditions by prioritizing investments that improve access to transit, reduce transportation costs, and support affordable mobility options. Programs supported through the Transportation Development Act, Transportation Fund for Air Quality, and Community-Based Transportation Planning efforts are specifically intended to mitigate the combined burdens of housing cost, income limitations, and transportation access. From a hazard mitigation perspective, understanding income and housing conditions is essential for ensuring that transportation systems remain reliable, affordable, and accessible for populations most at risk during emergency events and recovery periods.

Volume 1 provides the demographic characteristics of Napa County as a whole. Median income and poverty rates for Napa County are summarized in Table 11-1. As shown in the table, the median income for Napa County is close to $106,000 and the poverty rate is close to 8%.

Owner- and renter occupied numbers are provided in Table 11-2. As shown in the table, renters account for 35% of households and owners account for 65% of households in Napa County.

Table 11-1: Napa County Income and Poverty

Area	Median Income	Poverty Rate
Napa County (Unincorporated)	**$105,809**	**7.9%**
American Canyon	$122,694	7.4%
Calistoga	$96,667	5.4%
Napa (City)	$100,273	8.1%
St. Helena	$135,781	5.7%
Yountville	$75,134	10.6%

Source: ACS 5-Year, 2017-2022

Table 11-2: Napa County Renter- and Owner-Occupied Housing

Area	Total Occupied Housing Units	Renter	Rent %	Owner	Own %
Napa County (Unincorporated)	**49,218**	**17,142**	**35%**	**32,076**	**65%**
American Canyon	5,725	1,205	21%	4,520	79%
Calistoga	2,116	776	37%	1,340	63%
Napa (City)	29,443	12,052	41%	17,391	59%
St. Helena	2,466	792	32%	1,674	68%
Yountville	1,516	514	34%	1,002	66%

Source: ACS 5-Year, 2017-2022

11.2.2.2 Dependent & Disabled Populations

NVTA serves a population that includes a significant number of individuals who are transportation-dependent due to age, disability, medical conditions, or limited access to private vehicles. These populations represent a critical consideration in hazard mitigation planning because their mobility, safety, and access to essential services are closely tied to the continuity and reliability of public transportation systems. Individuals with disabilities frequently encounter structural and operational barriers that increase reliance on specialized and accessible transportation services. Physical mobility impairments, sensory limitations, cognitive disabilities, and chronic health conditions may restrict the ability to drive, walk extended distances, or independently utilize conventional fixed-route transit. NVTA addresses these needs through programs such as VineGo Paratransit Service, the Taxi Scrip Program, and partnerships supported by the Shared Vehicle Program, which collectively support equitable mobility for individuals with access and functional needs.

Transportation-dependent populations are particularly vulnerable during hazard events. Individuals who cannot drive or who require accessible vehicles may have limited evacuation options and may rely heavily on public transit systems for emergency mobility. Disruptions affecting transit operations, roadway accessibility, fueling or charging infrastructure, power supply, or communications systems may therefore produce disproportionate impacts on disabled and dependent populations. Extended service interruptions may affect not only mobility but also access to medical care, prescription services, grocery stores, employment, and essential social support networks. From a hazard mitigation perspective, maintaining transportation system resilience is therefore directly linked to protecting vulnerable populations, reducing life safety risks, and supporting community continuity and recovery. NVTA's role extends beyond mobility provision, functioning as a critical lifeline agency during emergencies.

Age represents a key factor influencing dependency and vulnerability to natural hazards. Older adults and children are widely recognized as dependent populations due to their reliance on caregivers for safety, mobility, and decision-making during emergency events. These populations often face heightened risks during disasters such as wildfires, floods, and earthquakes, particularly when compounded by disability, economic limitations, or social isolation. Volume 1 provides the demographic characteristics of Napa County as a whole.

Within Napa County, approximately 34 percent of households include at least one individual over the age of 65, and nearly 9 percent of all households consist of seniors living alone (Table 11-3). While only approximately 2 percent of senior households live below the poverty line, older adults, particularly those who are low-income, mobility-limited, or socially isolated, remain among the most vulnerable populations during hazard events. Challenges affecting older adults may include reduced mobility, chronic medical conditions, limited access to private transportation, reduced digital literacy, and diminished access to real-time emergency alerts. Seniors living alone may require additional assistance during evacuations, power outages, or extended service disruptions, while assisted living and congregate care facilities require advanced coordination to ensure continuity of care and resident safety.

Table 11-3: Napa County Households with Seniors

		Households with 65+					
Area	Households	65+	%	65+ Alone	%	65+ Poverty	%
Napa County (Unincorporated)	**55,588**	**18,777**	**33.8%**	**4,816**	**8.7%**	**1,271**	**2.3%**
American Canyon	5,924	1,772	29.9%	184	3.1%	111	1.9%
Calistoga	2,330	1,003	43.0%	419	18.0%	101	4.3%
Napa (City)	31,666	10,299	32.5%	2,674	8.4%	703	2.2%
St. Helena	2,963	1,153	38.9%	296	10.0%	42	1.4%
Yountville	1,824	873	47.9%	351	19.2%	77	4.2%

Source: ACS 5-Year, 2017-2022

Children represent another dependent population requiring special consideration (Table 11-4). In Napa County, approximately 26 percent of households include individuals under the age of 18, with approximately 6 percent of these households headed by a single caregiver. During emergencies, children are entirely dependent on caregivers for decision-making, transportation, and access to essential resources. Disruptions affecting schools, childcare facilities, and youth services may produce cascading social, economic, and developmental impacts. Households with limited financial resources or single caregivers may face additional challenges securing transportation, temporary housing, emergency supplies, and recovery assistance.

Table 11-4: Napa County Households with Children

		Households with Children <18			
Area	Households	<18	%	<18 Single Caregiver	%
Napa County (Unincorporated)	**55,588**	**14,596**	**26.3%**	**3,109**	**5.6%**
American Canyon	5,924	2,633	44.4%	417	7.0%
Calistoga	2,330	471	20.2%	33	1.4%
Napa (City)	31,666	8,934	28.2%	2,315	7.3%
St. Helena	2,963	619	20.9%	168	5.7%
Yountville	1,824	160	8.8%	0	0.0%

Source: ACS 5-Year, 2017-2022

Elderly populations face increased risks during disaster events due to the combined effects of age-related health conditions, mobility limitations, and potential social isolation. In American Canyon, approximately 10 percent of the non-institutionalized population lives with a disability, compared to approximately 12 percent countywide (Table 11-5). Among populations with access and functional needs, elderly individuals with disabilities represent a particularly vulnerable subgroup. This population includes seniors living with physical, sensory, or cognitive impairments, including reduced mobility, hearing or vision loss, reliance on assistive medical devices, neurocognitive conditions, and chronic health conditions that may be exacerbated by hazard events such as wildfire smoke exposure or extreme heat.

Table 11-5: Napa County Population with Disabilities and Access to Transportation

Area	Population	Persons w Disability	%	Persons Reliant on Public Trans.	%	Households	HH w No Vehicle	%
Napa County	**137,384**	**16,544**	**12.0%**	**890**	**0.6%**	**55,588**	**2,421**	**4.4%**
American Canyon	21,669	2,201	10.2%	287	1.3%	5,924	138	2.3%
Calistoga	5,191	573	11.0%	36	0.7%	2,330	83	3.6%
Napa (City)	79,233	9,837	12.4%	291	0.4%	31,666	1,554	4.9%
St. Helena	5,426	683	12.6%	121	2.2%	2,963	219	7.4%
Yountville	3,397	683	20.1%	15	0.4%	1,824	210	11.5%

Source: ACS 5-Year, 2017-2022

The interaction between advanced age and disability may also present challenges for long-term hazard mitigation. Elderly individuals with disabilities may encounter physical, financial, or logistical barriers when implementing resilience improvements. Activities such as seismic retrofitting, anchoring fuel tanks, foundation bracing, defensible space maintenance, or residential flood-proofing measures may be constrained by mobility limitations, fixed incomes, and access to technical or financial assistance. Many older adults reside in aging housing stock that may be more susceptible to earthquake damage or repetitive hazard impacts, further increasing long-term vulnerability.

11.2.2.3 Race, Ethnicity & Language

NVTA serves a service area characterized by substantial racial, ethnic, and cultural diversity. Several areas within the county exhibit higher concentrations of Hispanic or Latino residents, particularly within central and southern residential neighborhoods, while other areas are characterized by predominance of White residents or Asian residents. Smaller but meaningful concentrations of additional racial and ethnic groups are distributed throughout the county. This diversity is especially pronounced in communities such as American Canyon, which is widely recognized as one of the most demographically diverse jurisdictions within Napa County.

Natural disasters compound racial disparities; non-white individuals and communities receive less recovery aid from FEMA than their white counterparts, even where the amount of damage is the same. (Howell, Junia; Elliott, James R., 2019) (National Advisory Council, 2020) These disparities are evidence of the complicated relationship between disaster recovery and overlapping social vulnerabilities including race, income, language, and health. Black and Latino residents are more likely to be low income and renters, conditions which create barriers to navigating FEMA's Individual Assistance programs. Communities with more non-white residents may have lower tax revenue and property values, which means less investment in mitigation and rebuilding efforts before and after an emergency.

Racial and ethnic diversity has important implications for transportation planning, service delivery, and hazard mitigation. Travel behavior, transit reliance, and access to resources are often shaped by socioeconomic conditions, cultural factors, and historical patterns of development. Communities of color are more likely to include transit-dependent populations, households with fewer private vehicles, and residents employed in service-sector or shift-based occupations. As a result, disruptions affecting transportation infrastructure or transit operations may produce disproportionate impacts across certain racial and ethnic groups.

Language diversity further influences vulnerability within NVTA's service area. Residents with limited English proficiency (LEP) may encounter heightened barriers to understanding emergency alerts, accessing preparedness information, navigating evacuation procedures, and utilizing recovery assistance programs. According to ACS data, approximately 16 percent of households in Napa County speak Spanish at home, while approximately 4 percent of households report limited English proficiency (Table 11-6). In addition, according to passenger onboard surveys, nearly 1/3 of current NVTA riders are Spanish speaking individuals. These conditions underscore the importance of accessible and multilingual communication strategies, particularly during hazard events when timely dissemination of emergency information is critical to life safety.

Language barriers may also affect routine transportation access. Individuals with LEP may experience challenges interpreting service changes, detours, safety information, and emergency notifications affecting transit operations. During hazard events, these communication challenges may be amplified by rapidly evolving conditions, infrastructure disruptions, and the need for coordinated response actions. Ensuring that emergency messaging, service updates, and safety instructions are linguistically accessible remains an important component of transportation system resilience.

The spatial variability of racial and ethnic composition throughout Napa County, reinforces that vulnerability and service needs are not uniformly distributed. Certain neighborhoods may require targeted outreach, culturally appropriate engagement strategies, and multilingual emergency communications to ensure equitable access to transportation services and emergency information. These considerations are directly relevant to NVTA's planning, operations, and hazard mitigation efforts, as transportation systems serve a critical lifeline function for diverse populations before, during, and after disaster events.

Table 11-6: Napa County Household Languages

Area	Households (HH)	Spanish Speaking	%	Limited English	%
Napa County	**55,588**	**8,738**	**15.7%**	**2,141**	**3.9%**
American Canyon	5,924	1,069	18.0%	177	3.0%
Calistoga	2,330	474	20.3%	63	2.7%
Napa (City)	31,666	5,800	18.3%	1,653	5.2%
St. Helena	2,963	370	12.5%	88	3.0%
Yountville	1,824	49	2.7%	21	1.2%

Source: ACS 5-Year, 2017-2022

11.2.2.4 Social Vulnerability Index (SVI)

The Centers for Disease Control and Prevention (CDC) Social Vulnerability Index (SVI) for Napa County reveals important spatial and demographic patterns that have direct implications for equitable hazard mitigation planning. As discussed in detail in Volume 1, Section 1.4.3.6, the SVI is a composite measure developed by the CDC to identify communities that are more likely to require support before, during, and after a disaster. It incorporates a range of factors across four key dimensions: socioeconomic status, household composition and disability, minority status and language, and housing type and transportation access. The resulting index score ranges from 0 (lowest vulnerability) to 1 (highest vulnerability).

While Napa County is not uniformly classified as highly vulnerable when compared to other regions, localized patterns of social vulnerability are evident. NVTA's CBTP identifies multiple Equity Priority Communities (EPCs) where residents exhibit higher concentrations of characteristics commonly associated with elevated vulnerability, including lower incomes, higher percentages of seniors, greater prevalence of disability, limited vehicle access, and language barriers.

Similarly, the CBTP notes that certain unincorporated communities experience higher rates of low-income residents, seniors, individuals with disabilities, and residents who report limited English proficiency or lack of vehicle access. These overlapping conditions illustrate how social vulnerability is spatially concentrated rather than evenly distributed throughout Napa County.

Social vulnerability directly intersects with transportation system performance. Households with limited financial resources, individuals without access to private vehicles, seniors living alone, residents with disabilities, and individuals with limited English proficiency are more likely to depend on public transit systems both during routine conditions and emergency events. Hazard-related disruptions affecting transit operations, roadway networks, fueling or charging infrastructure, or communications systems may therefore produce disproportionate impacts on socially vulnerable populations.

Volume 1 provides a summary of Napa County's SVI as a whole.

11.2.3 Economy

NVTA operates within an economic environment that is both regionally significant and uniquely sensitive to disruption. Napa County's economy is strongly influenced by tourism, hospitality, agriculture, and wine production, sectors that collectively drive employment, generate tax revenues, and shape regional travel patterns. The county's global reputation as a premier tourism and wine destination results in substantial visitor activity, seasonal fluctuations in travel demand, and a workforce that relies heavily on the regional transportation system.

Tourism represents a dominant economic driver within Napa County. Visitor-serving industries, including hotels, restaurants, wineries, and related services, contribute significantly to local employment and revenue

generation. These industries are closely tied to transportation system performance, as visitors depend on roadway corridors, transit services, and multimodal infrastructure to access destinations throughout the Valley. Hazard events such as wildfires, floods, or severe weather may therefore produce economic consequences that extend beyond physical damage, including declines in visitation, business interruptions, and reductions in sales and occupancy tax revenues.

Agriculture, particularly viticulture, forms another foundational component of the county's economy. Napa County's agricultural lands support wine production, food processing, and related economic activities. These sectors depend on reliable transportation networks for workforce mobility, goods movement, and supply chain continuity. Transportation disruptions may affect employee access, freight reliability, and the movement of time-sensitive agricultural products.

Employment patterns within Napa County further illustrate the economic importance of transportation. Regional planning documents consistently note that a substantial portion of the county's workforce commutes from neighboring counties due to housing affordability constraints. This dynamic creates strong inter-county travel flows and increases reliance on major transportation corridors. Transportation system disruptions, whether caused by hazard events or infrastructure failures, may therefore have cascading effects on labor availability, business continuity, and regional productivity.

The Countywide Transportation Plan emphasizes the relationship between transportation investments and economic sustainability, recognizing that mobility, reliability, and system connectivity are essential for supporting workforce access, tourism activity, and business operations. Transit services operated by NVTA, including local, regional, and demand-response services, provide critical connections between residential areas, employment centers, healthcare facilities, and visitor destinations. These services are particularly important for lower-income workers, seniors, individuals with disabilities, and residents without consistent access to private vehicles.

Hazard events present distinct economic risks for NVTA and the communities it serves. Wildfires, flooding, earthquakes, and slope failure may disrupt transit operations, damage transportation infrastructure, degrade air quality, and restrict corridor access. These disruptions may result in lost productivity, reduced tourism activity, service interruptions, and increased operating and recovery costs. In a tourism-dependent economy, even temporary disruptions may produce measurable financial impacts.

From a hazard mitigation perspective, transportation resilience is directly linked to economic stability. Reliable transit operations, redundant routing options, resilient infrastructure, and continuity of operations planning help reduce the duration and severity of economic disruption following hazard events. NVTA's role as both a transportation provider and funding administrator positions the agency as a key contributor to regional economic resilience.

11.2.4 Growth Trends & Future Development

NVTA operates within a region characterized by steady population growth, evolving land use patterns, and shifting travel demands that will influence transportation planning and infrastructure needs in the decades

ahead. Although Napa County's overall population growth has historically been slower than in many neighboring Bay Area counties, long-term trends reflect continued demand for housing, employment opportunities, and visitor-driven travel. These trends are expected to shape not only routine mobility patterns but also NVTA's priorities related to congestion management, multimodal connectivity, and system resilience.

Regional planning projections incorporated into the Countywide Transportation Plan (CTP) anticipate moderate population growth within Napa County over the next 25 years, particularly concentrated in cities such as American Canyon, Napa, and portions of unincorporated communities within close proximity to employment centers. Growth trends are coupled with evolving economic and demographic shifts, including an aging population, increasing demand for accessible transportation services, and rising numbers of workers commuting across county lines due to housing affordability challenges. These dynamics contribute to continued pressure on transportation corridors and transit services, requiring NVTA to balance capacity, accessibility, and reliability while accommodating future travel needs.

Visitor-related growth also plays a defining role in future development patterns. Napa Valley's global tourism market continues to expand, attracting both domestic and international visitors whose travel patterns intersect with local and regional transportation systems. Tourist activity generates unique peak-period travel demands and places seasonal strain on key corridors such as State Route 29, State Route 121, and Silverado Trail. Planning for future development requires NVTA to account for not only resident and commuter travel but also visitor-induced congestion, which influences transit ridership, roadway performance, and the resiliency of evacuation routes during hazard events.

Land use and housing trends further influence NVTA's planning environment. Although Napa County has historically limited large-scale residential and commercial development in order to protect agricultural lands and preserve rural character, ongoing housing needs and regional affordability pressures are prompting updated planning efforts that encourage higher-density, mixed-use development within existing urbanized areas. This trajectory supports more efficient land use, potential increases in transit ridership, and greater emphasis on multimodal transportation alternatives. However, growth pressures also raise concerns regarding equitable access to transportation, impacts on infrastructure capacity, and interaction between development patterns and hazard exposure.

Environmental and sustainability objectives increasingly shape future transportation and land use planning in Napa County. Local jurisdictions and regional partners are incorporating climate adaptation and greenhouse gas reduction strategies into comprehensive planning frameworks, emphasizing transit-oriented development, active transportation infrastructure, and resilient infrastructure investments. NVTA's role in these efforts includes integrating hazard mitigation and climate resilience into transportation planning, ensuring that future development anticipates shifts in environmental conditions and supports sustainable mobility options.

Future development trends also underscore the importance of technological and operational innovation. Emerging mobility services, expanded micro transit options, electrification of transit fleets, and data-driven

service planning are all components of NVTA's strategy to meet future travel demands. Integrating these innovations with growth forecasts helps position the transit system to remain responsive to demographic shifts, travel pattern changes, and evolving rider expectations.

From a hazard mitigation perspective, understanding future growth trends is essential for prioritizing investments that enhance system reliability, connectivity, and redundancy. As development continues, transportation networks must remain capable of supporting daily travel, emergency evacuation, and post-event recovery. Investments in multimodal corridors, transit infrastructure, and operational resilience help ensure that both existing and future populations can safely access essential destinations during hazard events.

11.3 Planning Process

NVTA followed the planning process detailed in Volume 1, Section 2, including participating in the county-wide Hazard Mitigation Planning Team (HMPT) and formulating their own internal planning team to support the broader planning process.

The district's representatives in the Steering Group led stakeholder and public engagement efforts alongside the Consultant Team, with assistance from the county-wide HMPT and their internal planning team. This engagement process is described in Volume 1. Specifically, for the district, this included postings to the district website and social media, and outreach events, as documented in Appendix B. Examples of Key Stakeholders engaged by Napa County on behalf of the district with relevance to the development of NVTA's mitigation strategy include the USDA and other federal agencies; CAL FIRE and other state agencies; other jurisdictions; community-based organizations such as local Chamber of Commerce chapters; utility providers like PG&E; UC Davis and other academia; and local businesses.

All Key Stakeholders that were invited to participate in the planning process are listed in Volume 1, Section 2, and the input received from stakeholders was integrated into the district's annex, as described in Volume 1 Table 2-9. The district's internal planning team participants, their positions, and how they participated in the planning process are shown in Table 11-7.

Table 11-7: NVTA Planning Team and Steering Group Members

Team Members	Title	Description of Involvement
Libby Payan	Senior Program Planner – Administrator	Lead Point-of-Contact, HMPT #1, BO #2
Dexter Cypress	Transit Planner	Alternate Point-of-Contact, HMPT #2, BO #1 and #2
Danielle Schmitz	Executive Director	Participating Stakeholder, BO #1
Rebecca Schenck	Transit Manager	Participating Stakeholder, BO #2

NVTA staff participated in a comprehensive hazard mitigation planning process as part of the 2026 Napa County MJHMP update. This included a series of breakout meetings, listed in Table 11-8 that engaged the district's planning team, which included key district personnel and stakeholders in evaluating hazards, identifying local vulnerabilities, and prioritizing mitigation strategies

The process began with a County-Wide Steering Group Kickoff Meeting on February 28, 2024. This initial meeting focused on welcoming participants, establishing a shared understanding of the project scope and schedule, clarifying roles and responsibilities of the Steering Group, the county-wide Hazard Mitigation Planning Team (HMPT), and individual jurisdictional planning teams, and included a review of key changes since the 2020 Local Hazard Mitigation Plan The meeting set the foundation for coordinated participation throughout the planning effort.

On December 10, 2025, participants engaged in a hexagon mapping activity designed to visually identify mitigation actions that could benefit from or require inter-jurisdictional coordination. These collaborative efforts helped shape a refined set of mitigation alternatives, establish shared planning goals, and align local strategies with FEMA's Hazard Mitigation Assistance (HMA) funding framework.

Throughout the series of breakout meetings, the district engaged in a structured and collaborative planning process focused on assessing hazard risks, identifying vulnerabilities, and developing targeted mitigation strategies. The meetings began with recaps of the county-wide HMPT meetings to ensure alignment of goals and progress.

During the September 5, 2024 breakout out meeting, discussions concentrated on community engagement outcomes, initial risk assessments, and the integration of demographic data to better understand vulnerable populations. Jurisdictional teams reviewed their specific hazard exposures using the Risk Assessment Mapping Platform (RAMP) and participated in prioritization exercises to identify their top hazards.

The May 7, 2025 breakout meeting shifted toward reviewing local capabilities and defining specific areas of concern, which informed the drafting of problem statements. Teams worked collaboratively to refine mitigation alternatives, align actions with FEMA guidelines, and develop a shortlist of priority mitigation actions and inter-jurisdictional collaboration opportunities.

The meetings also included consensus-building activities around hazard rankings, capabilities, and planned actions, while providing regular updates on the overall project schedule.

Table 11-8: NVTA Planning Team Meetings

Meeting & Date	Agenda / Topics	Goals / Key Inputs
County-Wide Steering Group and HMPT Kick-off and Meetings #1 & #2 February 28, 2024– July 18, 2024		
NVTA Planning Team Breakout Meeting #1 September 5, 2024	▪ County-wide HMPT meetings #1 and #2 recaps ▪ Community engagement progress and results ▪ Risk assessment and community vulnerability ▪ Demographics and vulnerable populations ▪ Overview of jurisdiction-specific hazard risks and exposure ▪ Introduction to Risk Assessment Mapping Platform (RAMP) ▪ Jurisdiction-specific hazard risk ranking exercise ▪ Project schedule updates and next steps	▪ Consensus on jurisdiction-specific priority hazards ▪ Identify capabilities and potential mitigation actions ▪ Community engagement volunteers
County-Wide HMPT Meeting #3 March 25, 2025		
NVTA Planning Team Breakout Meeting #2 May 7, 2025	▪ Breakout Meeting #1 and HMPT #3 recaps ▪ Review capabilities assessment ▪ Review areas of concern and define problem statements ▪ Principles of effective mitigation strategies and actions, and mitigation alternatives ▪ Refine and align jurisdiction-specific mitigation actions exercise ▪ Project schedule updates and next steps	▪ Consensus on jurisdiction-specific capabilities ▪ Consensus on jurisdiction-specific areas of concern ▪ Consensus on priority mitigation actions and collaboration opportunities ▪ Community engagement volunteers
County-Wide HMPT Meeting #4 December 10, 2025		

11.3.1 Public Input & Draft Review

As detailed in Volume 1, Section 2, the draft plan was available for public review and comment from May 15 to June 2, 2026. Public comments received during that time were similar to those gathered throughout the public engagement process, including the need for more equity in the distribution of mitigation activities and funding and the need for enhanced cooperation among jurisdictions, utility providers, and state agencies. These comments were incorporated into the city's mitigation strategy, as appropriate; although, most were already addressed by the Mitigation Action Plan which was based on previous public input.

Public and stakeholder input was gathered and incorporated throughout the plan development process, before the public review period, such as from the online public survey (see Volume 1, Section 2.1.2 and Appendix B, for details). During the review period, jurisdictional staff and stakeholders that participated in the plan development also reviewed the public draft and provided comments on minor corrections and revisions, which were addressed in the final plan.

11.4 What's New

This section provides an overview of hazard mitigation planning efforts for the planning area and highlights the updates made in the 2026 MJHMP. This is the first time NVTA has participated in the MJHMP process. While not included in the 2020 plan, the district has since strengthened its focus on resilience through key efforts. Through this MJHMP process, NVTA has identified its highest-priority hazards, developed hazard-specific problem statements, and proposed actionable mitigation strategies.

By aligning with countywide partners and leveraging regional resources, NVTA has strengthened its capacity to prepare for, withstand and recover from disasters while continuing to protect its unique coastal community character.

11.4.1 Mitigation Activities

NVTA supports hazard mitigation through the integration of resilience principles into transportation planning, project development, and funding administration. Although NVTA's primary responsibilities center on congestion management, mobility, and transit operations, many agency-led activities inherently contribute to reducing risk and enhancing the reliability of the countywide transportation system under hazard conditions.

NVTA's long-range and short-range planning efforts serve as foundational mitigation tools. The CTP establishes policies and investment priorities that emphasize system reliability, multimodal connectivity, and corridor performance, all of which contribute to transportation network resilience. Similarly, the Short-Range Transit Plan (SRTP) identifies near-term capital investments and operational strategies necessary to maintain and enhance transit service continuity. Together, these planning frameworks guide infrastructure improvements, operational enhancements, and system modernization efforts that reduce vulnerability to disruptions associated with wildfire, flooding, seismic events, and severe weather.

NVTA also administers funding programs that enable mitigation-supporting projects. Through the coordination of state, federal, and local transportation revenues, including Surface Transportation Program (STP) funds, Transportation Development Act (TDA) funds, and Measure U sales tax revenues, NVTA directs resources toward projects that improve roadway conditions, enhance safety, increase modal alternatives, and strengthen critical transportation corridors. Measure U, in particular, provides jurisdictions with expanded flexibility to implement costlier capital improvements, address deferred maintenance, and fund projects supporting highway operations and emergency evacuations. These investments yield important mitigation co-benefits by improving corridor reliability, reducing failure risk, and enhancing emergency mobility.

Operationally, NVTA advances mitigation through transit system improvements, fleet modernization, and supporting infrastructure upgrades. Investments in vehicle replacement, electrification infrastructure, facility improvements, and communications systems contribute to service reliability and operational continuity. Multimodal initiatives, including bicycle and pedestrian infrastructure projects, further enhance system redundancy by expanding travel options during both routine and emergency conditions.

NVTA's mitigation-related activities are reinforced through coordination with local jurisdictions, regional agencies, and emergency management partners. Transportation networks serve a critical lifeline function during hazard events, particularly for evacuations, emergency response, and access to essential services. NVTA's planning and funding roles support regionally significant corridor improvements and system management strategies that reduce congestion, improve safety, and enhance the transportation system's ability to function under stress.

11.4.2 Mitigation Successes

Lifeline Taxi Program

The Taxi Scrip Program, also referred to as the Lifeline Taxi Program, is a taxpayer-funded mobility service administered by the NVTA to supplement the regular Vine Transit fixed-route system. The program is designed to provide flexible, on-demand transportation for eligible City of Napa residents who may be unable to use traditional transit services under certain conditions. While not intended to function as a primary mode of transportation, the program serves as an important lifeline resource for seniors and persons with disabilities, particularly for evening travel after fixed-route service hours or during periods when a rider's health or mobility limitations make bus travel impractical.

Under the program, NVTA helps eligible participants pay for taxi trips by providing PEX Visa Prepaid Cards that may be used toward eligible cab fares. The program subsidizes up to 50% of the first $18 of a taxi ride, reducing the rider's out-of-pocket cost while maintaining the service as a supplemental transportation option. Eligible participants may use their PEX Visa Prepaid Card to pay for approved taxi trips within the City of Napa.

Eligibility for the Taxi Scrip Program is limited to residents of the City of Napa who meet defined criteria. Qualified participants include individuals aged 65 years or older, individuals certified under the Americans with Disabilities Act (ADA), or individuals with disabilities of any age. Verification requirements ensure program integrity while enabling access for residents with documented mobility or disability-related needs.

The program operates under specific usage guidelines intended to support equitable access and financial sustainability. Taxi Scrip trips must originate and terminate within Napa city limits, and participants are subject to fare caps and ticket limits. Program rules address operational consistency, including restrictions on tipping, waiting time allowances, and replacement policies for lost or stolen identification cards.

From a hazard mitigation and resilience perspective, the Taxi Scrip Program provides an important adaptive mobility resource. During emergencies, service disruptions, or extreme conditions, the availability of subsidized, flexible transportation can help support access to medical services, essential destinations, and safe travel alternatives. The program contributes to NVTA's broader mission of maintaining mobility, accessibility, and continuity of transportation services for vulnerable populations.

Shared Vehicle Program

The Shared Vehicle Program is a specialized mobility initiative administered by the Napa Valley Transportation Authority (NVTA) to support nonprofit and public organizations that provide services to elderly individuals and persons with disabilities. The program was established to expand transportation capacity within Napa County by allowing qualified 501(c)(3) organizations to access NVTA-owned vehicles for client transportation needs. This approach enables community-based organizations to deliver essential mobility services without incurring the capital costs associated with vehicle acquisition and long-term fleet maintenance.

Eligibility for the program is limited to nonprofit, public, or 501(c)(3) organizations that provide services specifically for seniors or individuals with disabilities. Participating agencies are responsible for supplying qualified drivers and covering operational expenses such as fuel. Drivers must be identified through the borrowing agency's workers' compensation policy, and while not strictly required in all cases, possession of a Class B driver license is strongly encouraged due to vehicle classifications. Borrowing agencies must also maintain appropriate insurance coverage, including general liability and hired and non-owned auto liability insurance, with NVTA named as an additional insured.

NVTA's responsibilities within the program focus on safety, compliance, and fleet management. The agency conducts background checks and drug testing for designated drivers, verifies workers' compensation coverage, and provides driver training upon successful completion of screening requirements. Once approved, drivers are added to NVTA's vehicle insurance coverage. NVTA also assumes responsibility for vehicle maintenance, ensuring that shared fleet assets remain safe, reliable, and operationally sound.

Following driver approval and training, participating organizations may schedule vehicle use based on program availability. Borrowing agencies are responsible for vehicle pickup and return, trip documentation, and replacement of fuel used during operations. By leveraging shared public resources, the program enhances transportation accessibility, strengthens partnerships with community service providers, and supports mobility for populations with access and functional needs.

Vinego Paratransit Service

VineGo is the NVTA Americans with Disabilities Act (ADA)-compliant paratransit service, providing shared-ride, curb-to-curb transportation for individuals who are unable to use the regular Vine fixed-route bus system due to physical or cognitive limitations. The service operates within three-quarters of a mile of the fixed-route network and offers scheduled rides that can be booked up to seven days in advance; same-day trips may also be arranged depending on availability.

Eligibility for VineGo is determined on a case-by-case basis and requires applicants to complete an ADA paratransit application and telephone assessment. Once certified, riders can schedule shared rides from their homes to destinations within the service area, with drivers potentially picking up or dropping off other passengers along the route, as typical for ADA paratransit services.



Figure 11-2: VineGo Paratransit Shuttle

The service is intended to maintain independence and mobility for riders who cannot independently access or use fixed-route transit due to disability. Fares are set in accordance with ADA guidelines and generally reflect no more than twice the adult cash fare of regular Vine service. VineGo also accommodates ADA-eligible visitors from outside Napa, allowing temporary use of the service under specific conditions.

For those interested in applying, eligibility begins with an application submitted to NVTA's Paratransit Eligibility Office, followed by a telephone interview and assessment, with the option to appeal eligibility decisions if necessary.

Vine Transit Maintenance Facility

The Vine Transit Maintenance Facility is a major capital infrastructure project developed by the NVTA to support the long-term operational, maintenance, and resiliency needs of Vine Transit. Completed in March 2024 after breaking ground in February 2022, the approximately 28,000-square-foot facility is located on an eight-acre site on Sheehy Court in Napa. The project was undertaken to replace Vine Transit's former leased maintenance yard, which was identified as functionally deficient and incapable of supporting existing operations or future system expansion.

The state-of-the-art facility provides modernized maintenance, administration, and fleet support capabilities, including multiple maintenance bays, a bus wash, expanded vehicle parking, and infrastructure designed to accommodate zero-emission fleet technologies. The facility was constructed with future-focused design considerations, including provisions for hydrogen fueling and electric vehicle charging capacity, supporting Vine Transit's transition toward a zero-emission fleet. In addition to operational functions, the site also serves as a backup emergency operations center, enhancing regional transportation resilience and continuity during hazard events.

Funded through a combination of federal, state, and local sources, the approximately $39 million project was designed with environmentally sustainable materials and regulatory compliance under the California Environmental Quality Act (CEQA). The Vine Transit Maintenance Facility represents a critical investment in transportation system reliability, operational efficiency, workforce support, and hazard resilience, positioning NVTA to maintain and expand transit service for decades to come.



Figure 11-3: Ribbon Cutting new at the new Vine Transit Maintenance Facility

GETAC Tablets

NVTA can internally radio its drivers or use the GETAC tablet on the bus to talk to drivers if there was an emergency. NVTA could also manage any route deviations/detours on our CAD/AVL system that would then publish to third party applications (such as Google Maps or the Transit App) that ingest its General Transit Feed Specification Real Time Feed. NVTA would also have an representative in the EOC working under the operations branch that would be receive up-to-date information on the street network that could then be

communicated downstream to customer service representatives, drivers, dispatchers and operations managers.

Vine UpValley Link Program

To address transportation gaps identified through the 2025 Accessible Transportation Needs Assessment (ATNA), NVTA launched the Vine UpValley Link Program on July 1, 2026. The program was developed to expand mobility options for seniors and individuals with disabilities living in the upper Napa Valley communities of Yountville, St. Helena, and Calistoga, particularly for trips that extend beyond the traditional Vine Transit service area. The program directly supports ATNA recommendations to expand non-transit transportation options and improve access to essential destinations, including healthcare facilities such as St. Helena Hospital.

Vine UpValley Link functions as a subsidized transportation assistance program utilizing transportation network companies (TNCs) such as Uber and Lyft. Eligible participants include residents of Yountville, St. Helena, and Calistoga who are 65 years of age or older, ADA-certified, or disabled regardless of age. Through a reloadable payment card system, participants may contribute up to $50 per month, which is matched by NVTA, providing up to $100 in monthly transportation assistance. The program is designed to supplement existing transit services by providing flexible transportation for medical appointments, essential services, destinations not directly served by transit, and trips occurring when fixed-route or shuttle services are unavailable.

The Vine UpValley Link Program complements NVTA's existing mobility services, including VineGo Paratransit, Taxi Scrip, and the Shared Vehicle Program, further expanding the agency's portfolio of transportation solutions for vulnerable and transportation-dependent populations throughout Napa County.

11.5 Risk Assessment

This section focuses on profiling hazards specific to NVTA and assessing their vulnerability independent of the broader county-wide planning area, which has been evaluated in Section 3 of Volume 1. The hazard profiles in Volume 1 discuss overall impacts to the planning area and describe relevant plans, policies, and regulations; past events; location; frequency and probability of future occurrences; severity and extent; warning time; secondary hazards; and climate change impacts. For more information on risk assessment methodologies, see Volume 1, Appendix A.

This section includes a tailored vulnerability assessment, analyzing assets at risk such as population, property, and critical facilities and infrastructure unique to the district, and information on district-specific differences in hazard vulnerability across the planning area. It also identifies total district assets at risk, including people, property, and critical facilities and infrastructure within the district. In addition, this section presents growth and development trends for the community, offering insights into vulnerabilities and risks that represent the broader context of assets at risk.

11.5.1 Hazard Screening & Prioritization

Members of the Planning Team from each participating jurisdiction came together to collaboratively decide which county-wide hazards would be included in the MJHMP, and which would be excluded. Hazard screening and prioritization took place early in the process and integrated historic data, local knowledge, and consensus opinions to create a risk assessment matrix for the county as well as for each participating jurisdiction. These matrices indicate the priority of hazards prior to further refinement. Details about this process, the results of the discussion, and in-depth profiles for county-wide hazards can be found in Volume 1, Sections 2 and 3.

NVTA's internal planning group used the same hazard identification and prioritization process as the county-wide Planning Team. They reviewed previously prepared hazard mitigation plans and other relevant documents to determine the realm of natural hazards that have the potential to affect the district. Table 11-9 provides a crosswalk of hazards identified in select planning documents, including the 2020 Napa County MJHMP, 2021 MTC MMP, 2025 CBTP, other planning documents and the 2023 State of California HMP. The crosswalk was used to develop a preliminary hazards list, providing a framework for the group to evaluate which hazards were truly relevant to NVTA and which ones were not.

The internal planning group then ranked hazards based on their probability of affecting NVTA and potential impacts on the community. Figure 11-4 displays the results of the hazard risk ranking exercise that was performed before further refinement. All hazards have been profiled in Volume 1 of this document. The purpose of this annex is to specifically address the district's vulnerability to specifically identified hazards.

Table 11-9: NVTA Document Review of Potential Hazards

Hazard	2020 Napa County MJHMP	2021 MTC MJHMP	2023 California SHMP
Agricultural Pests	■		■
Avalanche			■
Climate Change	■		■
Coastal			■
Dam Failure	■	■	■
Drought	■	■	■
Earthquake / Liquefaction	■	■	■
Extreme Cold			■
Extreme Heat			■
Extreme Weather / Storms	■		■
Flood	■	■	■
Geologic / Mass Movement	■	■	■
Human-Caused			■
Insects			■
Levee Failure			■
Pandemic Disease	■	■	■
Sea Level Rise			■
Soil			■
Subsidence			■
Tornado			■
Tsunami / Seiche Wave		■	■
Volcano			■
Wildfire	■	■	■

Risk Assessment Matrix Definitions

PROBABILITY RATING

The likelihood of a hazard event occurring within a time period?

PROBABILITY

- **Highly Likely** - 100% annual probability. Or Likely to occur every year in your lifetime.
- **Likely** - between 10 & 100% annual probability. Or will occur several times in your lifetime.
- **Possible** - between 1 & 10% annual probability. Or Likely to occur some time in your lifetime.
- **Unlikely** - less than 1% annual probability. Or unlikely but possible to occur in your lifetime.

IMPACT RATING

In terms of injuries, damage, or death, would you anticipate impacts to be minor, limited, critical, or catastrophic when a significant hazard event occurs? The impact could be in terms of one hazard event (flooding from a culvert failure) or a large-scale event (multiple rivers flooding) in the same jurisdictional boundary.

IMPACT

Minor	Limited	Critical	Catastrophic

Minor - very few injuries, if any. Only minor property damage & minimal disruption on quality of life. Temporary shutdown of critical facilities.

Limited - minor injuries only. Approx. 10% or less of property in disaster footprint damaged or destroyed. Complete shutdown of critical facilities for more than one day.

Critical - multiple deaths/injuries possible. Between 25% and 50% of property in disaster footprint is damaged or destroyed. Complete shutdown of critical facilities for more than one week.

Catastrophic - high number of deaths/injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for 30 days or more.

To concentrate resources, the jurisdictional planning team will focus on "High" and "Extreme" risk hazards, and "Medium" risk hazards to a lesser extent. These hazards have the higher probability and greater impact as it relates to the jurisdictions planning area.

Hazard definitions are included in **Vol. 1** of this plan. Some hazards are discussed as subset hazards— e.g., "Levee Failure" within the "Flood" hazard profile. If a hazard is not present on the risk matrix, is grey, or categorized as a "Low" risk hazard, the jurisdictional planning team felt the hazard had a minimal footprint or impact within their planning area and chose not to profile the hazard.

Hazard Information / Legend:



Climate Change impacts will be addressed within each relevant hazard section within the plan update and as a stand alone section for each jurisdiction. Climate change may change the frequency, duration, or intensity of other hazards profiled.

Napa Valley Transportation Authority Risk Matrix

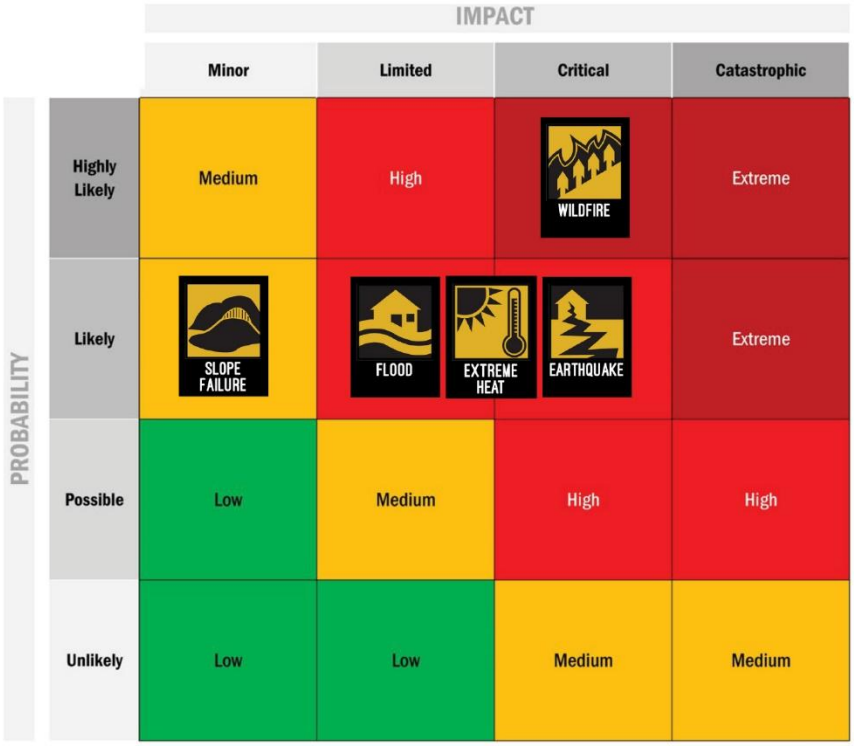


Figure 11-4: NVTA Risk Assessment Matrix

Note: Hazard naming in the Risk Assessment Matrix may not match the final naming used. Refer to hazards prioritization summary table.

Priority Hazards

The results of the initial risk ranking exercise completed by the city's Planning Team, before further refinement, are identified in the county's completed matrix in Figure 11-4. Table 11-10 provides the final list of priority hazards and subhazards with additional details about why certain hazards were chosen and why others were not prioritized. However, it should be noted that many hazards not prioritized for profiling are briefly discussed as secondary or compounding hazards, and subhazards that were profiled and included in the risk assessment are listed specifically.

Table 11-10: NVTA Hazards Prioritization Summary

Hazard	Priority	Explanation
Earthquake / Liquefaction	**High**	**Profiled in Volume 1, Section 3.3.4, and Section 11.5.2.2 in this annex** (not including Liquefaction due to low probability and impact potential)
Wildfire	**Extreme**	**Profiled in Volume 1, Section 3.3.1, and Section 11.5.2.1 in this annex**
Flood	**High**	**Profiled in Volume 1, Section 3.3.2, and Section 11.5.2.3 in this annex**
Levee Failure	-	Profiled in Volume 1, Section 3.3.2; not a priority due to low probability and impact potential
Extreme Weather / Storms	-	Profiled in Volume 1, Section 3.3.5; not a priority due to being outside jurisdictional mission and authority, but Heavy Rain discussed as a compounding hazard to Flood
Drought	-	Profiled in Volume 1, Section 3.3.6; not a priority due to being outside jurisdictional mission and authority
Geologic / Mass Movement	**Medium**	**Profiled in Volume 1, Section 3.3.5, and Section 11.5.2.4 in this annex as Slope Failure**
Extreme Heat	**High**	**Profiled in Volume 1, Section 3.3.8, and Section 11.5.2.5 in this annex**
Agricultural Pests	-	Profiled in Volume 1, Section 3.3.9; not a priority due to being outside jurisdictional mission and authority
Sea Level Rise	-	Profiled in Volume 1, Section 3.3.9; not a priority due to low probability and impact potential
Climate Change	**High**	**Profiled in Volume 1, Section 3.3.9, and Section 11.5.2.6 in this annex** and discussed as a compounding hazard in relevant profiles
Dam Failure	-	Profiled in Volume 1, Section 3.3.3; not a priority due to low probability and impact potential

11.5.2 Vulnerability to Specific Hazards

Assessing vulnerabilities exposes the unique characteristics of individual hazards and begins the process of narrowing down which areas within the district are vulnerable to specific hazard events. The vulnerability assessment considered unique local knowledge of hazards and impacts and a GIS overlaying method for examining such vulnerabilities in more depth. Using these methods, the district's planning group estimated vulnerable populations, properties, and assets, and potential losses. In addition, the exposure of district assets to drought, earthquake, wildfire, flood, and climate change hazards were also considered.

Many of the hazard profiles include a snapshot map and damage estimation tables that illustrate the district's vulnerabilities to those specific hazards. These maps assisted the planning group in understanding the hazard exposure of populations, parcels, and critical facilities and infrastructure. Each snapshot map contains an exposure summary that displays the percentage of the population, the improvement and content value of parcels, and the amount of critical infrastructure that is exposed. For hazards without geospatial extents, such as drought and severe weather, narratives are provided instead of exposure maps and tables.

Based on the hazard prioritization exercise, this vulnerability assessment focuses on six hazards for the NVTA.

Wildfire
SECTION 11.5.2.1



Earthquake
SECTION 11.5.2.2



Flood
SECTION 11.5.2.3



Slope Failure
SECTION 11.5.2.4



Extreme Heat
SECTION 11.5.2.5



Climate Change
SECTION 11.5.2.5



11.5.2.1 Wildfire Hazard

Wildfire represents one of the most significant natural hazards affecting Napa County and the transportation systems operated and supported by NVTA. The County's climate, vegetation patterns, and topographic conditions combine to create an environment highly conducive to wildfire ignition and rapid fire spread. Hot, dry summers, extended drought cycles, and periodic extreme wind events contribute to elevated fire risk across both rural and developed areas. Climate change has further intensified these conditions by increasing temperatures, reducing fuel moisture, and lengthening wildfire seasons throughout California.

Wildfire hazards present multiple direct and indirect risks to NVTA's transportation network as shown in Figure 11-5 and summarized in Table 11-11 and Table 11-12. Fire events may disrupt roadway access, damage transportation infrastructure, reduce visibility, and degrade air quality. Critical transportation corridors, including state highways and local arterial routes, may be subject to temporary closures, traffic congestion, or restricted operations during wildfire incidents. Because Napa County's circulation patterns are strongly corridor-dependent, disruptions affecting key routes can significantly affect regional mobility, emergency response, and evacuation efficiency.

Transit operations are particularly sensitive to wildfire-related impacts. Smoke conditions may create hazardous operating environments, affecting driver safety, vehicle performance, and passenger health. Reduced air quality can present serious health risks, especially for vulnerable populations such as seniors, individuals with disabilities, and persons with pre-existing respiratory conditions. Wildfire events may also disrupt fueling infrastructure, power supply systems, communications networks, and maintenance facilities, all of which are essential for maintaining service continuity.

Wildfire-related evacuations represent a critical operational consideration. Transportation networks serve a vital lifeline function during emergency evacuations, supporting both population movement and emergency response activities. Increased traffic volumes, congestion, and rapidly changing conditions may affect transit routing, scheduling, and system reliability. Transit-dependent populations may rely heavily on public transportation services when private vehicle access is limited or unavailable.

Wildfire hazards may also produce longer-term system impacts. Damage to roadway infrastructure, traffic control systems, communications equipment, and electrical supply networks can lead to extended service disruptions. Post-fire conditions, including debris flows, slope instability, and erosion, may further affect transportation corridors and infrastructure reliability, particularly during subsequent storm events.

NVTA's exposure to wildfire risk is influenced by regional land use patterns and development trends. Much of Napa County includes wildland-urban interface (WUI) areas where development and fire-prone landscapes intersect. Transportation corridors frequently traverse these environments, increasing the likelihood that wildfire events may affect roadway operations and transit services.

Table 11-11: NVTA Facilities Wildfire Exposure

Lifelines (miles) - Wildfire Severity Zone									
Infrastructure Type (Linear)	SRA Very High	LRA Very High	Very High Total	SRA High	LRA High	High Total	SRA Moderate	LRA Moderate	Moderate Total
Bus Route	0.23	-	2.34	5.44	-	69.70	9.82	-	66.77

Table 11-12: NVTA Linear Infrastructure Wildfire Exposure

Critical Infrastructure - Wildfire Severity Zone									
Infrastructure Type	SRA Very High	LRA Very High	Very High Total	SRA High	LRA High	High Total	SRA Moderate	LRA Moderate	Moderate Total
Bus Stop	-	-	-	-	11	11	-	13	13

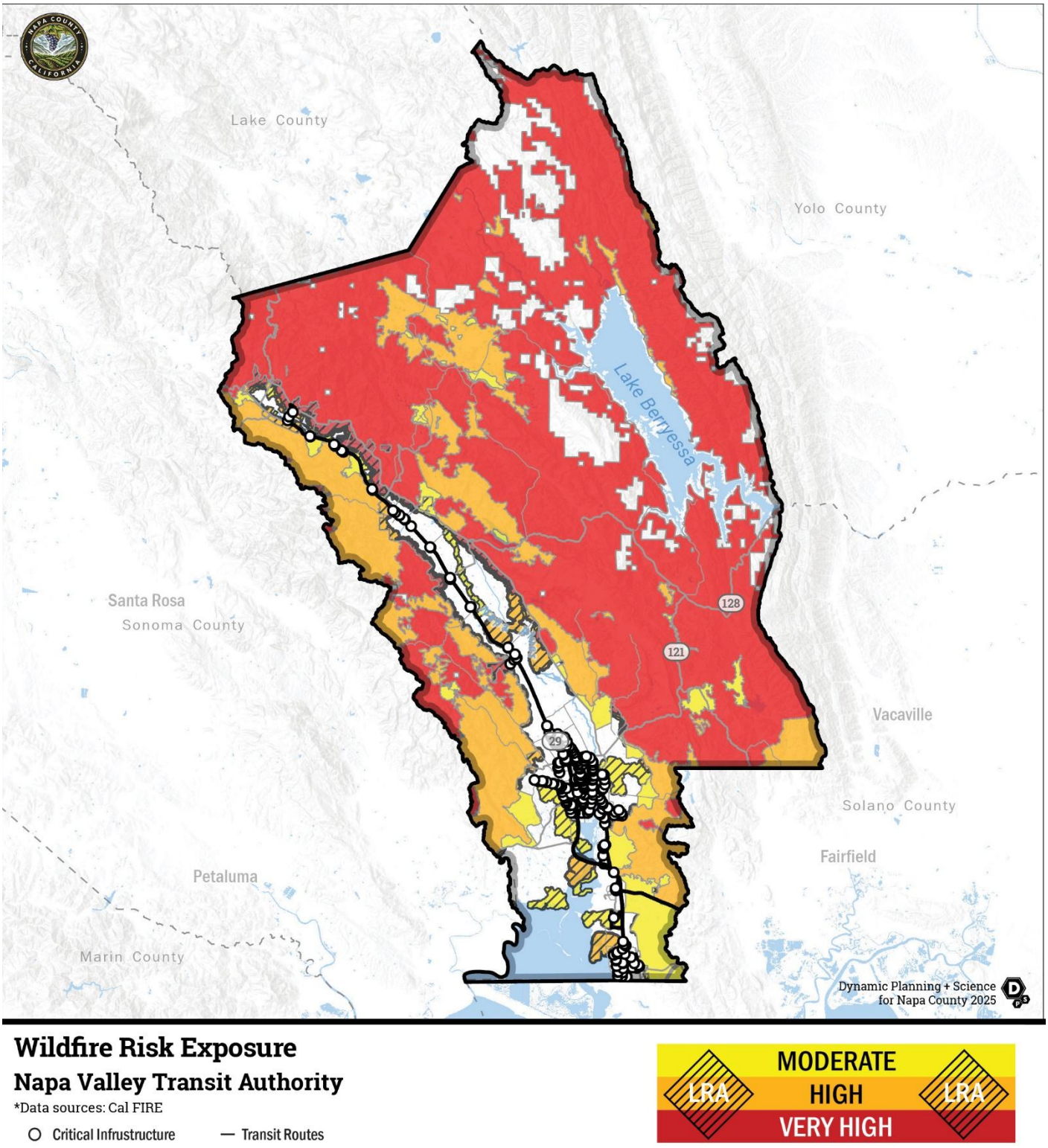


Figure 11-5: NVTA Wildfire Risk

11.5.2.2 Earthquake Hazard

Earthquake hazards represent a significant risk within Napa County due to the region's location within one of the most seismically active areas in the United States. The County is influenced by several active fault systems, including the West Napa Fault, which was responsible for the 2014 South Napa earthquake. This event highlighted the region's vulnerability to seismic activity and demonstrated the potential for widespread infrastructure damage, transportation disruptions, and prolonged recovery impacts.

Seismic events pose both direct and indirect risks to NVTA's transportation network and transit operations and shown in Figure 11-6 and Figure 11-7 and summarized in Table 11-13, Table 11-14, Table 11-15, and Table 11-16. Ground shaking may damage roadways, bridges, overpasses, traffic control systems, utilities, and transit facilities. Even moderate earthquakes can produce pavement cracking, surface deformation, and structural stress affecting transportation corridors. Damage to bridges and elevated structures is of particular concern, as Napa County's circulation patterns are heavily dependent on a limited number of regional corridors and crossing points.

Transit operations are highly sensitive to earthquake-related disruptions. Seismic events may impair roadway accessibility, disrupt fueling and power systems, damage maintenance facilities, and affect communications infrastructure necessary for service coordination. Vehicle operations may be temporarily suspended due to safety concerns, debris, structural assessments, or traffic management requirements. Extended service interruptions can have disproportionate consequences for transit-dependent populations.

Secondary hazards associated with earthquakes may further affect transportation systems. Ground failure, including liquefaction, lateral spreading, and settlement, may occur in areas with susceptible soil conditions. These effects can damage pavement sections, undermine roadway, embankments, and structural foundations. Landslides and slope failures may also occur in hillside and mountainous areas, potentially blocking roadways and isolating portions of the network.

Earthquake hazards may produce cascading system impacts. Damage to electrical infrastructure, communications systems, and fuel supply networks can affect transit service continuity even where roadway damage is limited. Emergency response activities and post-event inspections may introduce operational constraints, contributing to congestion and service delays.

Napa County's transportation network includes several critical facilities and corridors that play an essential role during emergency response and recovery. Transportation systems serve as lifeline infrastructure following seismic events, supporting emergency services, medical response, damage assessment, and community recovery. Maintaining operational flexibility and system redundancy is therefore central to NVTA's hazard planning framework.

The County's built environment includes infrastructure of varying age and design standards, which influences seismic vulnerability. Older bridges, roadways, and facilities constructed under previous building codes may exhibit increased susceptibility to damage. Seismic retrofits, modernization efforts, and state-of-good-repair investments represent important mitigation strategies for reducing these risks.

Table 11-13: NVTA Facilities Earthquake Risk (M7.1 Hunting Creek–Berryessa)

Lifelines (miles) - M7.1 Hunting Creek Berryessa				
Infrastructure Type (Linear)	VIII - Severe	VII - Very Strong	VI - Strong	V - Moderate
Bus Route	-	198.2	283.9	-

Table 11-14: NVTA Linear Assets Earthquake Risk (M7.1 Hunting Creek–Berryessa)

Lifelines (miles) - M7.1 Hunting Creek Berryessa				
Infrastructure Type	VIII - Severe	VII - Very Strong	VI - Strong	V - Moderate
Bus Stop	-	148	108	-

Table 11-15: NVTA Facilities Earthquake Risk (M6.7 West Napa)

Lifelines (miles) - M6.7 West Napa				
Infrastructure Type (Linear)	V-Moderate	VI-Strong	VII-Very Strong	VIII-Severe
Bus Route	2.2	81.9	115.8	282.2

Table 11-16: NVTA Linear Assets Earthquake Risk (M6.7 West Napa)

Critical Infrastructure - M6.7 West Napa				
Infrastructure Type	VIII - Severe	VII - Very Strong	VI - Strong	V - Moderate
Bus Stop	194	42	20	-

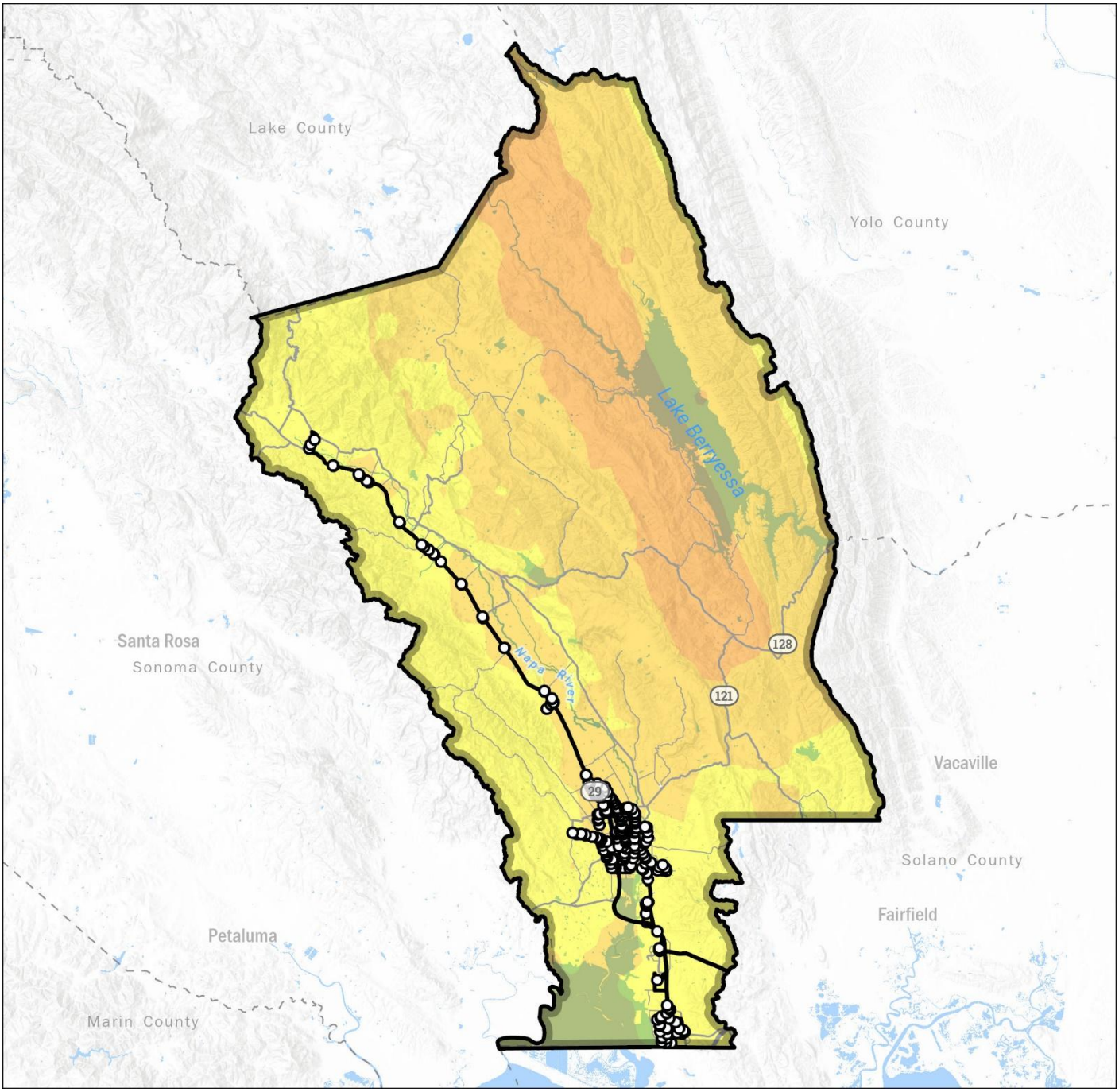


Figure 11-6: NVTA Earthquake Risk (M7.1 Hunting Creek–Berryessa)

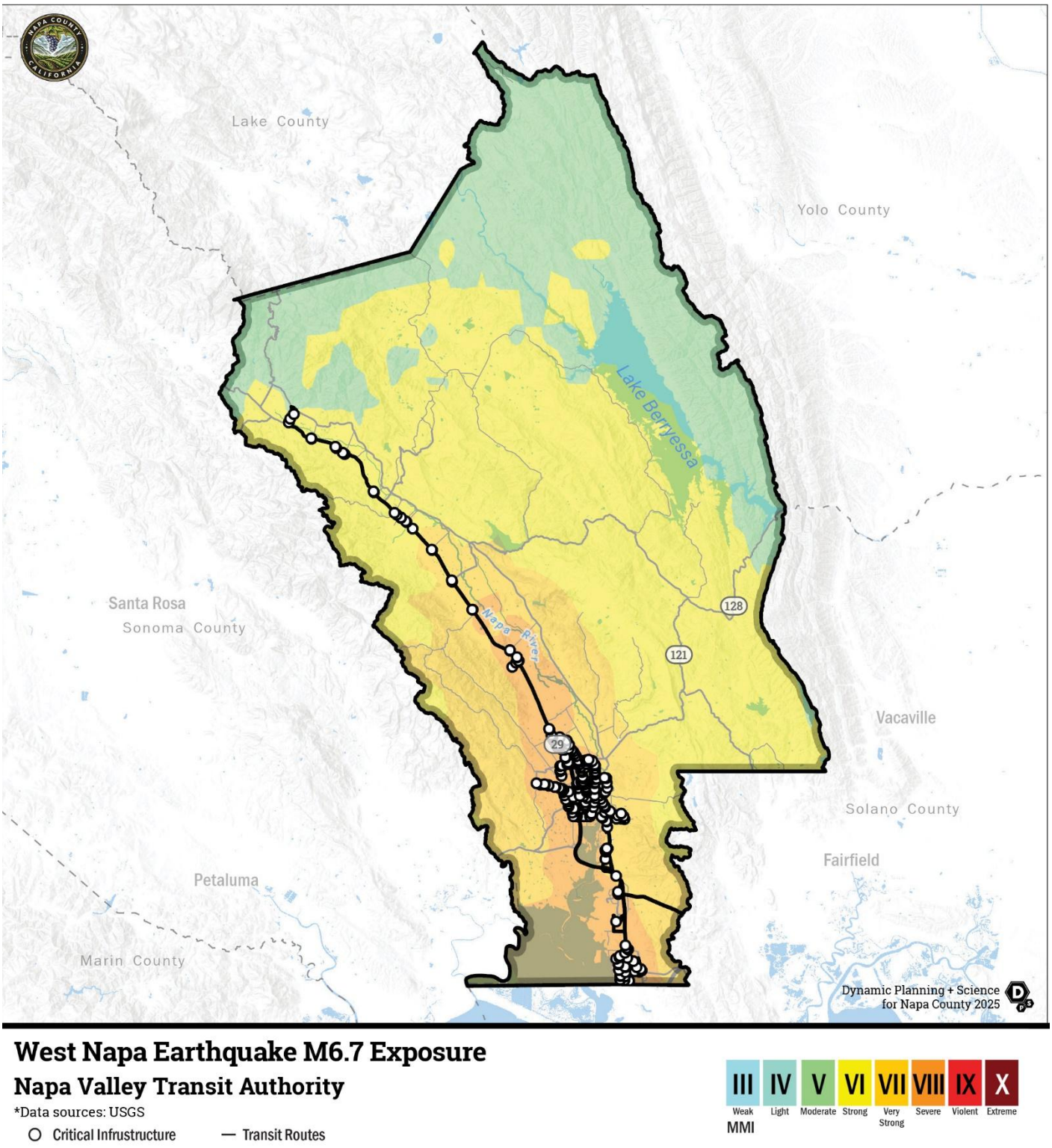


Figure 11-7: NVTA Earthquake Risk (M6.7 West Napa)

11.5.2.3 Flood Hazard

Flooding represents a recurring and operationally significant hazard within Napa County, driven by seasonal precipitation patterns, watershed dynamics, and the geographic characteristics of the Napa River system. Unlike low-frequency hazards such as major earthquakes, flood events occur with greater regularity and can produce both localized and widespread impacts to transportation infrastructure and transit operations supported by NVTA.

Flood hazards in Napa County are primarily associated with riverine flooding, stormwater runoff, and localized drainage issues. Periods of intense rainfall, atmospheric river events, and saturated soil conditions can cause waterways to exceed channel capacity, resulting in overbank flooding. Urban and suburban flooding may also occur when stormwater systems are overwhelmed or when drainage pathways are obstructed. Low-lying areas, roadway underpasses, and corridors adjacent to waterways are particularly vulnerable.

Flooding poses direct risks to transportation networks by impairing roadway accessibility, damaging pavement structures, and disrupting traffic operations. Standing water, debris deposition, erosion, and slope instability may render roadways unsafe or impassable. Even relatively minor flood events can require temporary lane closures, detours, or traffic control measures. Because Napa County's circulation system relies heavily on key corridors and limited routing alternatives, flood-related disruptions can significantly affect regional mobility.

Transit operations are especially sensitive to flood conditions. Flooded roadways may force route deviations, schedule delays, or temporary service suspensions. Reduced visibility, hydroplaning risks, and debris hazards can affect vehicle safety and operational reliability. Flooding may also impact transit-supporting infrastructure, including maintenance facilities, electrical systems, communications equipment, and fueling or charging infrastructure.

Flood hazards frequently generate cascading impacts. Roadway closures may increase congestion on unaffected routes, complicate emergency response, and disrupt evacuation or re-entry movements. Damage to utilities, including electrical and communications systems, may further affect transit operations even where physical roadway damage is limited.

Napa County's flood risk is influenced by hydrologic variability and climate trends. While seasonal rainfall patterns are characteristic of the region, climate change is expected to increase the intensity and variability of storm events. More concentrated precipitation may elevate the likelihood of flash flooding, drainage system exceedance, and infrastructure stress. Post-wildfire conditions may further amplify flood risk by increasing runoff rates, debris flows, and erosion.

From a transportation perspective, flooding represents both an infrastructure and operational hazard. Impacts may include pavement deterioration, roadway subgrade weakening, signal system disruptions, and reduced corridor reliability. Transit-dependent populations may experience disproportionate effects when service interruptions limit access to employment, healthcare, and essential services.

Climate Change & Severe Weather

Climate change functions as a risk multiplier for severe weather hazards. Rising temperatures can increase the severity of severe weather events, while shifts in precipitation patterns may intensify storm impacts. These trends introduce growing uncertainty into transportation system performance and operational reliability.

Heavy precipitation events may produce localized flooding, roadway ponding, and drainage exceedance. High winds may affect vehicle stability, increase debris hazards, and disrupt operations. While these events are often short in duration, they may generate immediate operational constraints and safety concerns.

Severe weather events may also disrupt transit operations through secondary impacts. Electrical infrastructure strain, Public Safety Power Shutoff (PSPS) events, and localized equipment failures may affect communications systems, charging infrastructure, fare systems, and facility operations. High temperatures combined with wildfire smoke conditions may further degrade air quality, amplifying health risks for passengers and operators.

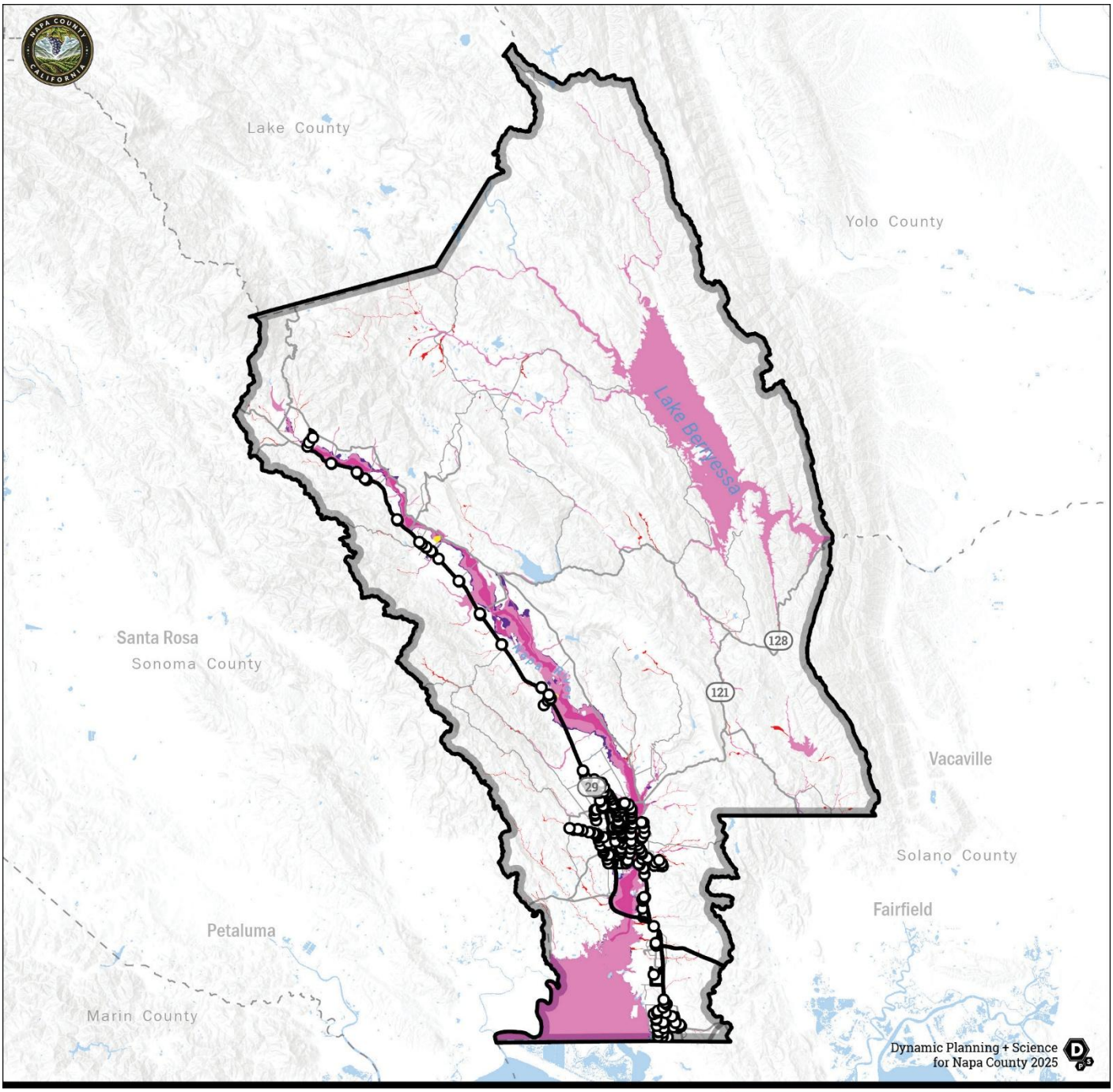


Figure 11-8: NVTA Flood Risk (FEMA and DWR Awareness Zones)

Table 11-17: NVTA Linear Asset in FEMA Flood Zones

Lifelines (miles) - Flood Risk Exposure					
Infrastructure Type (linear)	Flood Fringe	Floodway	100-YR Total	500-YR sans 100-YR	Grand Total
Bus Route	64.7	9.0	73.7	20.7	94.4

Table 11-18: NVTA Facilities in FEMA Flood Zones

Critical Infrastructure (points) - Flood Risk Exposure					
Infrastructure Type	Flood Fringe	Floodway	100-YR Total	500-YR sans 100-YR	500-YR Total
Bus Stop	31	7	38	14	52

11.5.2.4 Slope Failure Hazard

Slope failure represents a localized but potentially high-consequence hazard within Napa County, particularly in areas characterized by steep terrain, hillside development, and transportation corridors traversing mountainous or sloping landscapes. Slope failures encompass a range of ground movement processes, including landslides, debris flows, rockfalls, and soil slumps, all of which may affect roadway stability, infrastructure integrity, and transit operations supported by NVTA.

Slope failures are typically triggered by a combination of environmental and geologic factors. Intense or prolonged rainfall is one of the most common initiating mechanisms, as soil saturation reduces slope stability and increases the likelihood of mass movement. Seismic activity may also trigger slope failures by destabilizing soils and fractured rock formations. Wildfire events can further amplify risk by removing vegetation, altering soil properties, and increasing runoff rates, thereby elevating susceptibility to post-fire debris flows and erosion.

Transportation networks are particularly vulnerable to slope failure hazards due to their frequent alignment along hillsides, cut slopes, and canyon corridors. Ground movement may result in roadway blockage, pavement deformation, embankment instability, and structural damage to retaining systems, bridges, culverts, and drainage infrastructure. Rockfalls and debris deposition may create sudden safety hazards, while larger slope failures may produce extended closures and costly repairs.

Napa County's geography includes numerous hillside and mountainous areas where slope stability concerns are inherent. Rural and regional transportation corridors often traverse terrain susceptible to landslides and debris flows, particularly during heavy storm events. Localized slope failures may isolate portions of the roadway network, reduce routing alternatives, and complicate emergency response or evacuation movements.

Transit operations are sensitive to slope failure impacts because even small-scale events may disrupt service continuity. Roadway obstructions, unstable slopes, and debris hazards may necessitate route deviations, delays, or temporary suspensions. Secondary impacts, including drainage system damage

and erosion, may prolong operational disruptions. Corridor-dependent travel patterns may further magnify the consequences of localized failures. The exposure of NVTA facilities and assets are shown in Figure 11-9 and summarized in Table 11-19 and Table 11-20.

Slope failure hazards often produce cascading effects. Blocked roadways may increase congestion on alternate routes, affect emergency vehicle access, and disrupt passenger mobility. Damage to drainage infrastructure may exacerbate flooding risks, while repeated slope instability may require long-term stabilization measures.

Climate variability plays an important role in slope failure risk. Changes in precipitation intensity, including more concentrated storm events, may increase soil saturation, runoff rates, and erosion potential. Post-wildfire conditions may significantly elevate debris flow risks, particularly during the first major rainfall events following fire incidents.

Table 11-19: NVTA Linear Assets in Landslide Susceptibility Zones

Lifelines (miles) - Landslide Susceptibility			
Infrastructure Type (Linear)	High	Moderate	Low
Bus Route	2.1	37.0	13.6

Table 11-20: NVTA Facilities in Landslide Susceptibility Zones

Critical Infrastructure - Landslide Susceptibility			
Infrastructure Type	High	Moderate	Low
Bus Stop	-	11	3

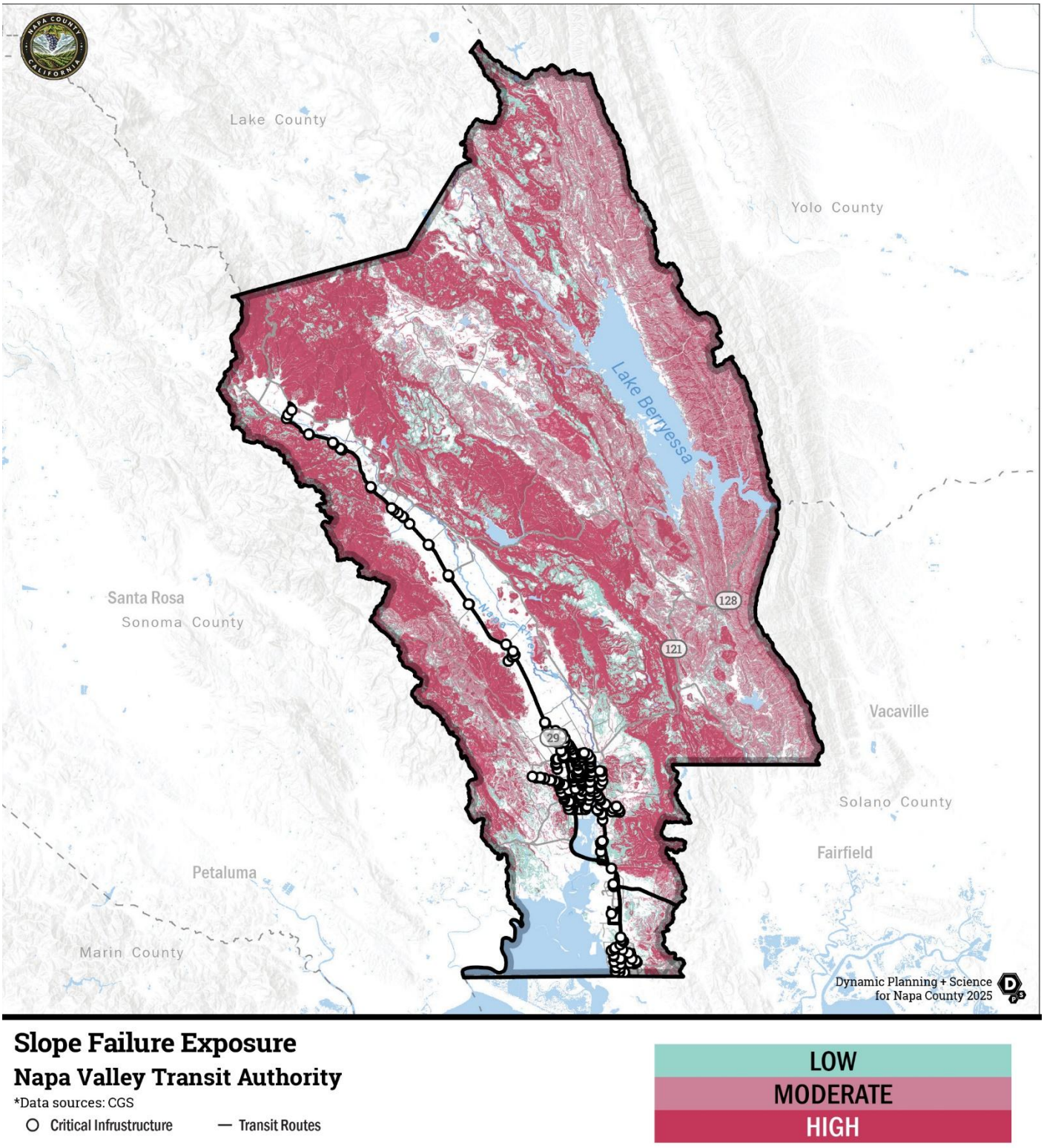


Figure 11-9: NVTA Landslide Susceptibility

11.5.2.5 Extreme Heat Hazard

Extreme heat hazards in Napa County can affect transportation infrastructure, transit operations, and passenger safety. These hazards most commonly include extreme heat, heavy precipitation events, high winds, and storm-related disruptions. Among these, extreme heat represents one of the most operationally significant and increasingly frequent hazards affecting NVTA.

Extreme heat events are characterized by prolonged periods of elevated temperatures that exceed historical seasonal norms. Climate projections for California indicate rising average temperatures, more frequent heatwaves, and longer-duration extreme heat events. These conditions can impose both direct and indirect stresses on transportation systems. High temperatures accelerate pavement deterioration, increase thermal expansion of roadway materials, and strain vehicle mechanical systems. Transit vehicles, facilities, and supporting infrastructure may experience increased cooling demands, reduced operational efficiency, and higher maintenance requirements.

Extreme heat presents critical health and safety concerns for transit-dependent populations. Passengers waiting at bus stops, particularly those without shade or cooling access, may be exposed to hazardous conditions. Vulnerable populations, including seniors, individuals with disabilities, and persons with pre-existing medical conditions, face heightened risk of heat-related illness. Paratransit riders may be especially sensitive due to underlying health vulnerabilities and longer trip durations. Heat exposure risks may be compounded during service delays, vehicle breakdowns, or power disruptions.

11.5.2.6 Climate Change Hazard

Average annual temperatures across most of California have already increased by more than 1°F, with some areas experiencing rises of over 2°F when comparing the 1901 to 1960 average to that of 1986 to 2016. Daily maximum temperatures, a key indicator of extreme heat, are projected to increase by 4.4°F to 5.8°F by 2050 and by 5.6°F to 8.8°F by 2100. Heat waves that impact public health, known as heat-health events, are also expected to intensify across the state. By 2050, these events are projected to last up to two weeks longer in the Central Valley and occur four to ten times more often in the Northern Sierra region (California Natural Resources Agency, 2022).

California is already experiencing significant impacts from climate change, including prolonged drought, a lengthened wildfire season, increased coastal flooding and erosion, and widespread tree mortality. The state has observed rising average temperatures, more extreme heat days, fewer cold nights, a longer growing season, and shifts in the water cycle, with less winter precipitation falling as snow. In addition, summertime fog has declined by approximately 33%, and both snowmelt and rainwater runoff are occurring earlier in the year (Cal OES, 2018).

According to Cal-Adapt, NVTA will likely experience a climate change-driven increase in extreme heat days above 98.6°F from four days per year to 22 days per year by the end of the century under a medium emissions scenario (RCP 4.5). Over the same time period, NVTA is also likely to see an increase in warm nights above 59.5°F from five per year to 39.

Long-term trends indicate a 12% to 20% decline in fog across California from 1900 through projections to 2070. Climate experts suggest that warming temperatures reduce the ability of air masses to cool enough to produce fog, which plays a critical role in supporting California's ecosystems (Grantham, Teodore; University of California, Berkeley, 2018).

Climate change represents a long-term, cross-cutting hazard that influences the frequency, intensity, and duration of multiple natural hazards affecting Napa County and the transportation systems operated and supported by NVTA. Unlike discrete hazard events, climate change functions as a risk multiplier that amplifies existing environmental stresses such as wildfire, flooding, extreme heat, drought, and severe storms. These changes introduce increasing uncertainty for transportation planning, infrastructure durability, and transit operations.

Projected climate trends for Northern California indicate rising average temperatures, more frequent extreme heat events, longer wildfire seasons, and greater variability in precipitation patterns. These conditions are expected to increase the likelihood of both drought and intense storm events, which can affect transportation infrastructure in different ways. Prolonged heat may accelerate pavement degradation, increase vehicle maintenance needs, and elevate operational costs. Conversely, more intense rainfall events may overwhelm drainage systems, contribute to flooding and erosion, and destabilize slopes along transportation corridors.

For NVTA, climate change poses both infrastructure and operational risks. Transportation systems are particularly sensitive to changing environmental conditions because they depend on reliable roadway networks, electrical infrastructure, communications systems, and fuel or charging supply chains. Extreme heat may stress vehicle systems and passenger environments, while wildfire smoke events may degrade air quality and disrupt service operations. Increased precipitation intensity may lead to roadway closures, transit detours, and safety concerns for vehicle operations.

Climate change also increases exposure to compound hazards, where multiple hazards occur simultaneously or sequentially. For example, wildfire events followed by heavy rainfall may trigger debris flows or slope failures along transportation corridors. Similarly, extreme heat events combined with power disruptions may affect transit facility operations, vehicle charging infrastructure, and passenger safety.

Transportation-dependent populations may face disproportionate impacts from climate-related hazards. Seniors, individuals with disabilities, low-income residents, and persons without access to private vehicles often rely on public transit systems for daily mobility. These populations may be particularly vulnerable during extreme heat events, wildfire smoke conditions, or service disruptions that limit access to cooling centers, healthcare facilities, and essential services.

Climate change considerations are increasingly integrated into transportation planning and infrastructure investment decisions. NVTA's planning documents emphasize sustainability, emissions reduction, and transition toward zero-emission transit fleets. Investments in electrification infrastructure, multimodal transportation options, and resilient transit facilities help address both climate mitigation and climate adaptation objectives.

11.5.3 Climate Change Impacts & Vulnerable Populations

Climate change is expected to amplify existing natural hazards within Napa County, intensifying the frequency, severity, and duration of events that directly affect transportation systems and the populations served by the NVTA. Rising temperatures, altered precipitation patterns, prolonged drought conditions, and increasing wildfire intensity represent some of the most significant climate-driven stressors influencing regional risk conditions. These environmental changes introduce both physical infrastructure challenges and social vulnerability considerations.

Projected increases in extreme heat events may affect transportation infrastructure performance, transit operations, and passenger safety. Elevated temperatures can accelerate pavement deterioration, strain vehicle systems, and increase cooling demands within transit vehicles and facilities. Heat exposure also presents health risks for transit-dependent individuals, particularly older adults, persons with disabilities, and individuals with pre-existing medical conditions. Prolonged heat events combined with power disruptions may further complicate mobility for populations reliant on electrically powered systems.

Wildfire risk represents one of the most visible climate-related hazards affecting Napa County. Climate projections indicate longer fire seasons, drier fuels, and more extreme fire behavior. Wildfire events may disrupt roadway networks, reduce air quality, interrupt power supply, and impede transit operations. Vulnerable populations, including senior citizens, individuals with disabilities, low-income households, and residents without access to private vehicles, may face disproportionate challenges during wildfire incidents. These groups may have fewer evacuation options, heightened sensitivity to smoke exposure, and greater reliance on public transportation systems for emergency mobility.

Changes in precipitation intensity and variability may also increase flooding risks, debris flows, and erosion-related impacts. Even where long-term precipitation totals remain stable, more concentrated storm events can overwhelm drainage systems and damage transportation infrastructure. Flood-related disruptions may affect roadway access, transit routes, and service continuity. Vulnerable populations may experience compounded impacts when mobility interruptions limit access to employment, healthcare, and essential services.

Climate change can also exacerbate underlying social vulnerabilities. Individuals with limited financial resources may have reduced capacity to adapt to rising transportation costs, relocate from hazard-prone areas, or invest in protective measures. Older adults and persons with disabilities may face greater sensitivity to environmental stressors such as heat, smoke, and service disruptions. Households without reliable vehicle access may depend heavily on transit systems during emergencies, increasing the importance of system resilience.

Environmental conditions influenced by climate change may further affect public health, which in turn influences mobility needs. Poor air quality from wildfire smoke, extreme heat exposure, and disruptions to medical or social services may increase transportation demand for vulnerable populations. Transit systems

frequently serve as lifeline services under these conditions, supporting evacuation, access to cooling centers, healthcare facilities, and essential destinations.

11.5.4 Hazard Problem Statements

As part of the mitigation action identification process, the Planning Committee for each jurisdiction identified areas of concern (aka problem statements) for their respective facilities based on the risk assessment and vulnerability analysis, utilizing the RAMP mapping and static snapshot maps. Problem statements focused on the impact, victim, or threat that the hazard could create in the jurisdiction, as described in Table 11-21. Identifying common issues and weaknesses through these problem statements assisted the planning group in understanding the realm of resources needed for mitigation.

The goal is to have at least one mitigation action for every problem statement. Projects or actions have been developed to mitigate each problem identified. See Table 11-23 for a full list of mitigation actions and corresponding problem statements that they address. Each problem statement is coded with a problem number for cross-referencing between Table 11-21 and Table 11-23

Table 11-21: NVTA Hazard Problem Statements

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-AH-NVTA-002	All Hazard	Threat	**Napa Valley Transportation Authority**	NVTA lacks a formal Continuity of Operations Plan to address post-disaster disruptions to bus service and operations.	ma-AH-NVTA-001
ps-AH-NVTA-333	All Hazard	Threat	**Napa Valley Transportation Authority**	Although NVTA's most critical facilities have backup generators, they are vulnerable to prolonged power outages caused by extreme heat, PSPS, and storm events, which severely reduce bus charging and operational capacity.	ma-WF-NVTA-002
ps-CC-NVTA-001	Climate Change	Threat	**Napa Valley Transportation Authority**	Increasing frequency and severity of climate change-driven hazards such as extreme heat and wildfire threaten infrastructure, assets, and users, and compound other operational risks.	ma-AH-NVTA-001, ma-CC-NVTA-001, ma-FL-NVTA-001, ma-SW-NVTA-001, ma-WF-NVTA-001
ps-EQ-NVTA-001	Earthquake	Impact	**Napa Valley Transportation Authority**	Earthquake-related damage to key roadways and bridges could severely disrupt bus routes and paratransit services, limiting access to essential destinations and delaying response.	ma-AH-NVTA-001, ma-AH-NVTA-002
ps-EQ-NVTA-334	Earthquake	Impact	**Napa Valley Transportation Authority**	A major earthquake could disrupt power and communication systems, cutting off communication between operations and drivers.	ma-AH-NVTA-001, ma-WF-NVTA-002, ma-AH-NVTA-002
ps-FL-NVTA-001	Flood	Threat	**Napa Valley Transportation Authority**	Flooding threatens 30 bus stops and 73 miles of routes.	ma-AH-NVTA-002, ma-FL-NVTA-001

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-FL-NVTA-002	Flood	Victim	**Napa Valley Transportation Authority**	Flooding of the 3rd Street Bridge and Highway 29 would isolate low-income communities from critical transit services.	ma-AH-NVTA-002, ma-CC-NVTA-001, ma-FL-NVTA-001
ps-SW-NVTA-001	High Heat	Victim	**Napa Valley Transportation Authority**	Heatwaves can disrupt service and threaten the health of paratransit riders and other transit-dependent populations.	ma-AH-NVTA-002, ma-CC-NVTA-001, ma-SW-NVTA-001, ma-WF-NVTA-001
ps-SW-NVTA-002	High Heat	Impact	**Napa Valley Transportation Authority**	Bus stops have insufficient shelters to protect waiting riders from extreme heat, especially during prolonged service delays or if the GTFS Real Time Feed is out.	ma-SW-NVTA-001
ps-SW-NVTA-003	High Heat	Threat	**Napa Valley Transportation Authority**	Extreme heat events can strain the regional power grid, increasing the risk of prolonged outages. Backup power at key facilities may be insufficient to maintain operations during these peak demand periods.	ma-WF-NVTA-002
ps-SF-NVTA-001	Slope Failure	Threat	**Napa Valley Transportation Authority**	Landslide-prone road segments in hillside and rural areas threaten route continuity and driver and passenger safety, especially during or after heavy rain events.	ma-AH-NVTA-001, ma-FL-NVTA-001, ma-AH-NVTA-002, ma-CC-NVTA-001
ps-SF-NVTA-002	Slope Failure	Impact	**Napa Valley Transportation Authority**	Slope failures along routes can damage transportation infrastructure, causing delays, costly repairs or temporary service cancellations.	ma-AH-NVTA-001, ma-FL-NVTA-001, ma-AH-NVTA-002
ps-WF-NVTA-001	Wildfire	Threat	**Napa Valley Transportation Authority**	Bus routes traverse high wildfire risk areas, threatening infrastructure, busses, riders and drivers from both direct and indirect impacts such as road blocks and smoke.	ma-AH-NVTA-001, ma-AH-NVTA-002, ma-CC-NVTA-001, ma-WF-NVTA-001
ps-WF-NVTA-002	Wildfire	Victim	**Napa Valley Transportation Authority**	Wildfire smoke poses health risks to passengers and drivers due to inadequate ventilation systems on busses.	ma-AH-NVTA-002, ma-WF-NVTA-001
ps-WF-NVTA-003	Wildfire	Impact	**Napa Valley Transportation Authority**	Wildfires and red flag warning days trigger PSPSs, jeopardizing electric bus charging capacity and limiting NVTA?s ability to maintain service continuity.	ma-WF-NVTA-002

11.6 Mitigation Strategy

This section provides the framework for how NVTA will reduce hazard risk within its jurisdiction while supporting the broader goals of the Napa County MJHMP. It includes an overview of existing capabilities, opportunities to strengthen resilience, and the district's prioritized mitigation actions. Together, these elements demonstrate how NVTA integrates hazard awareness into its planning and development processes while contributing to a coordinated countywide approach.

Within the Napa County MJHMP, the mitigation strategy serves as the roadmap for future hazard mitigation efforts. For NVTA, the strategy outlined in this annex reflects the outcomes of the countywide planning process while also addressing the district's unique risks, priorities, and community needs. The strategy is designed to reduce vulnerabilities identified in the risk assessment, including the problem statements developed for wildfire, earthquakes, flooding, slope failure, and extreme heat.

Mitigation actions identified in this annex include both policy-based and project-based initiatives, with an emphasis on integrating resilience into land use planning, infrastructure investments, and community programs. Actions are structured to align with FEMA's requirements and to coordinate with existing district, county, and regional planning mechanisms. Each action identifies responsible parties, potential funding sources, and the resources needed for implementation.

For NVTA, this strategy provides a framework for strengthening resilience by combining district-led initiatives, such as infrastructure improvements, and community preparedness, with regional coordination through the MJHMP. By advancing these efforts in alignment with the Strategic Plan and other local planning documents, NVTA enhances its ability to reduce hazard risk while supporting long-term community safety, sustainability, and economic stability.

The subsections that follow describe these elements in detail:

- **Sections 11.6.1, Capabilities and Opportunities,** provides a summary of NVTA's capacity to address natural hazards.
- **Section 11.6.2, Mitigation Action Plan,** presents the authority's prioritized actions to guide implementation in coordination with countywide strategies.
- **Section 11.6.3, Status of Previous Mitigation Actions,** provides a summary of all previous actions and their current status, whether completed, cancelled, or revised.

Aligning the Action Plan

This section connects NVTA's mitigation actions with its existing capabilities and areas for growth. Capability assessments are a required element of hazard mitigation planning under the Disaster Mitigation Act of 2000 and FEMA's 2023 guidance, ensuring that actions are realistic, achievable, and aligned with available resources.

The section begins with a summary of NVTA's capabilities across four areas: planning and regulatory, administrative and technical, fiscal, and education and outreach. This overview highlights the tools and

strengths that the district already uses to reduce hazard risk. The section then provides a detailed analysis of each capability area, identifying both current practices and opportunities to expand resilience.

11.6.1 Capabilities & Opportunities

This section provides a detailed assessment of Napa Valley College's current capabilities to support hazard mitigation, as well as future opportunities. This consists of describing how the college is planning for hazards and growth and a summary of its existing capabilities and the potential for enhancement.

11.6.1.1 Planning for Hazards & Growth

NVTA operates at the intersection of two closely related planning imperatives: accommodating long-term growth in travel demand while ensuring that the transportation system remains reliable and functional under hazard conditions. Napa County's transportation network is shaped by geographic constraints, corridor-dependent travel patterns, and exposure to multiple natural hazards, including wildfire, flooding, earthquake, and extreme weather. As a result, NVTA's planning framework inherently integrates considerations of both system capacity and system resilience.

NVTA's long-range planning efforts, most notably the CTP, provide the primary mechanism for aligning transportation investments with projected growth trends and evolving risk conditions. The CTP establishes policies and performance objectives that emphasize corridor reliability, multimodal connectivity, safety, and operational efficiency. These objectives support not only routine mobility needs but also hazard-related priorities, such as maintaining viable evacuation routes, reducing congestion during emergencies, and minimizing the consequences of infrastructure disruptions. By evaluating land use patterns, travel forecasts, and infrastructure conditions, the CTP guides investments that address future demand while reducing system vulnerabilities.

Short-range planning further supports adaptive capacity. The Short-Range Transit Plan (SRTP) identifies near-term capital improvements, fleet investments, and operational strategies necessary to maintain service reliability within a dynamic operating environment. Because transit systems are particularly sensitive to disruptions involving roadway closures, power supply interruptions, and extreme environmental conditions, the SRTP functions as an important resilience planning tool. Investments in fleet modernization, electrification infrastructure, facility upgrades, and communications systems contribute to both operational performance and hazard readiness.

Hazard planning considerations are reinforced through NVTA's participation in regional hazard mitigation efforts. As a participating agency in the Metropolitan Transportation Commission's Multi-Jurisdictional Hazard Mitigation Plan (MJHMP), NVTA contributes to regional risk assessments, critical facility inventories, and mitigation strategy development. This coordination ensures that transportation-related vulnerabilities, including corridor dependencies, facility exposures, and operational risks, are evaluated within a broader, multi-hazard planning context. Integration of hazard data into transportation decision-making supports investments that enhance infrastructure durability, improve system redundancy, and reduce failure risks.

Growth trends and hazard conditions are closely interrelated. As development patterns evolve and travel demand increases, pressure on key transportation corridors may intensify, potentially amplifying the consequences of hazard-related disruptions. Congestion, limited routing alternatives, and infrastructure constraints may affect evacuation efficiency, emergency response, and system recovery. NVTA's planning framework addresses these challenges by prioritizing projects that improve corridor performance, enhance multimodal alternatives, and strengthen network connectivity. Multimodal investments, including transit, bicycle, and pedestrian infrastructure, increase system flexibility and provide additional mobility options during both routine and emergency conditions.

Funding mechanisms such as Measure U further support integrated planning for hazards and growth. By providing jurisdictions with expanded financial flexibility, bonding authority, and eligibility for a broader range of transportation improvements, Measure U enables accelerated delivery of infrastructure projects that address deferred maintenance, congestion, safety, and emergency mobility needs. These investments yield important resilience co-benefits by reducing infrastructure deterioration, improving operational reliability, and enhancing corridor performance under stress.

11.6.1.2 Development & Hazard Considerations

Land use and development patterns within Napa County are closely linked to both transportation system performance and hazard vulnerability. NVTA's planning responsibilities require the agency to evaluate how existing and future development may influence travel demand, infrastructure capacity, and the transportation network's ability to function during hazard events. Because Napa County's growth is largely concentrated within established urban areas while much of the surrounding land remains rural or environmentally constrained, development decisions carry important implications for system reliability and resilience.

New development can increase demand on already corridor-dependent transportation networks. As residential, commercial, and mixed-use projects are introduced, traffic volumes, transit ridership, and multimodal travel needs may grow. In hazard-prone environments, increased congestion and limited routing alternatives may amplify the consequences of disruptions caused by wildfire, flooding, seismic events, or severe weather. Transportation corridors that serve as critical evacuation routes may experience operational stress during emergencies, particularly when growth outpaces infrastructure improvements.

Development location is also a key hazard consideration. Projects situated in wildfire-prone areas, floodplains, or locations subject to slope instability may introduce long-term transportation risks. Roadway access, emergency response routes, and transit service reliability may be affected by hazard exposure, infrastructure damage, or environmental constraints. Development in hillside and wildland-urban interface areas, for example, may increase evacuation complexity while placing greater demands on limited roadway networks.

NVTA's planning framework addresses these interactions through coordination with local jurisdictions, integration of land use forecasts, and alignment of transportation investments with growth patterns. The CTP evaluates projected development trends to prioritize infrastructure improvements that enhance

corridor performance, safety, and multimodal connectivity. By directing resources toward capacity enhancements, operational improvements, and system modernization, NVTA helps mitigate the transportation impacts associated with growth while reducing vulnerability to disruptions.

Hazard considerations are further integrated through environmental review processes and regulatory frameworks. Development projects are evaluated under the California Environmental Quality Act (CEQA), which requires analysis of environmental impacts, including transportation, emergency access, and hazard-related conditions. These evaluations help identify infrastructure needs, mitigation measures, and design considerations that reduce risk and improve system performance.

11.6.1.3 Capabilities & Opportunities Assessment

To develop a realistic and actionable mitigation strategy, it must account for existing jurisdictional capabilities and what future opportunities there are to enhance those capabilities for purposes of hazard mitigation. This section provides an assessment of the district's existing capabilities and future opportunities, including planning and regulatory, administrative and technical, fiscal, and public outreach and education capabilities. This assessment also identifies opportunities to integrate this MJHMP into future planning, policies, or programs to weave mitigation efforts into daily operations and address hazard problems wholistically. Capabilities are categorized into four groups and include various mechanisms.

- **Planning and Regulatory Capabilities:** Existing long-range plans, emergency response plans, hazard-specific plans, land use policies, and building and development standards.
- **Administrative and Technical Capabilities:** Available expertise in emergency services, engineering, grant management, and community planning.
- **Fiscal Capabilities:** Budgetary capacity, taxing authority, grants, and other funding mechanisms that can support mitigation projects.
- **Outreach and Education Capabilities:** Existing programs for providing technical assistance, community education, public warnings, and stakeholder engagement.

A full description of the process used to develop the capabilities assessment is provided in Volume 1, Section 2.3.3.

This capabilities and opportunities assessment for NVTA lists the various types of capabilities along with how they have been, currently are, or will in the future be integrated into hazard mitigation planning efforts. The three "HMP Integration" columns that identify the capability's status and usage are color-coded with green, yellow, or orange shading to communicate the following:

- **Status:** If the capability is present at all and what level of use it has generally.
- **Current Mitigation Use:** If the capability is currently being used in mitigation efforts, specifically, and at what level.
- **Future Opportunity:** If there is a future opportunity to integrate the capability into mitigation efforts and at what level.

Summary of Capabilities & Opportunities

This Capabilities and Opportunities Assessment for NVTA summarizes the various types of capabilities it has for hazard mitigation currently. The assessment also identifies opportunities to integrate, expand, and improve the authority's capabilities for future hazard mitigation. Table 11-22 provides a comprehensive list of capabilities and identifies the current status, current mitigation use, and future opportunities.

Planning & Regulatory

NVTA's planning and regulatory capabilities are primarily reflected through its long-range transportation planning, capital programming, and coordination with local, regional, state, and federal partners. While NVTA is not a traditional hazard response agency, many of its core functions support hazard mitigation, system resilience, and continuity of operations.

NVTA's Capital Improvements Program (CIP), Short-Range Transit Plan (SRTP), and related planning documents provide the primary framework for identifying, prioritizing, and funding resilience-related projects. These include facility upgrades, fleet modernization, infrastructure improvements, state-of-good-repair investments, and multimodal mobility enhancements. Seismic safety, earthquake modernization, and non-structural improvements are generally addressed through these broader capital planning efforts rather than standalone hazard-specific programs.

NVTA does not maintain agency-specific fire prevention, floodplain response, stormwater management, drought, groundwater, FireWise, or CWPP programs, as these functions generally fall outside its statutory mission and are managed by local jurisdictions, special districts, fire agencies, or emergency management partners. However, NVTA coordinates with these agencies when transit facilities, corridor improvements, evacuation routes, or infrastructure investments intersect with wildfire, flooding, seismic, or other hazard concerns.

Climate adaptation and sustainability planning are among NVTA's strongest hazard-related capabilities. Climate action, emissions reduction, zero-emission fleet investments, electrification infrastructure, multimodal transportation options, and air quality programs are embedded throughout the Countywide Transportation Plan, SRTP, and related initiatives. These efforts provide both environmental and resilience benefits by addressing long-term risks associated with extreme heat, wildfire conditions, infrastructure stress, and climate change.

Future integration of the MJHMP will occur through various processes and mechanisms outlined across multiple mitigation actions (Table 11-23). Key opportunities for future hazard mitigation integration with NVTA's existing planning mechanisms include using the updated risk assessment, projected climate change impacts, and hazard-specific vulnerability findings to inform the Develop Continuity of Operations Plan action (ma-AH-NVTA-001) and the Climate-Ready Transit Infrastructure Assessment action (ma-CC-NVTA-001). Additional integration opportunities will occur through implementation of related capital, operational, and communication-focused mitigation actions, including Drainage Improvements for Bus Stops & Operations Center (ma-FL-NVTA-001), Bus Stop Shelter Expansion (ma-SW-NVTA-001), Enhance

Backup Power & Communication Systems (ma-WF-NVTA-002), Improve Bus Alert Systems (ma-AH-NVTA-002), and Enhance Vehicle Air Quality & Cooling Systems (ma-WF-NVTA-001).

Administrative & Technical

NVTA's administrative and technical capacity reflects its role as a transportation planning agency, funding administrator, and transit operator. Although NVTA is not a traditional emergency management organization and does not have a dedicated Emergency Manager, emergency coordination is supported through executive leadership, operations staff, and partnerships with Napa County OES and local jurisdictions. During hazard events, NVTA can support transit operations, evacuation mobility, service updates, and interagency coordination.

NVTA maintains important technical capabilities through in-house engineering, planning, communications, outreach, GIS, grant administration, and program management functions. Engineering staff support infrastructure planning, facility improvements, capital investments, and resilience-oriented project development. Communications and outreach staff provide public information, media coordination, emergency messaging, and bilingual engagement for Spanish-speaking communities. GIS support is available through planning staff, consultants, and partner agencies, though not through a dedicated GIS position. NVTA also has strong grant and program management capacity, which supports its ability to secure and administer funding for infrastructure, fleet modernization, and hazard mitigation-related investments.

Warning Systems & Services

NVTA's warning and notification capabilities are focused on transit operations, service continuity, and rider communication rather than hazard detection or emergency alert issuance. Regional life safety alerts for wildfires, floods, earthquakes, and other major hazards are issued by Napa County emergency management agencies, while NVTA supports those efforts by providing transit-specific updates.

NVTA communicates service disruptions, detours, schedule changes, and safety-related information through tools such as the Transit App, agency websites, text messages, and social media. These platforms allow the agency to provide near real-time rider alerts during localized hazards, particularly flooding events that affect roads, routes, and service reliability. During wildfire or earthquake events, NVTA does not issue evacuation orders or hazard warnings, but it supports response efforts by coordinating service changes, sharing rider information, reinforcing County-led messaging, and communicating the status of transit operations, facilities, and safety conditions.

Fiscal

NVTA's fiscal capabilities are shaped by its role as a congestion management agency, transportation planning authority, and transit operator. The agency does not have independent taxing authority and relies on voter-approved transportation sales tax measures, state and federal funding, grants, and farebox revenues to support transportation improvements and resilience-related investments.

Transportation sales tax revenues are administered through the NVTA - Tax Agency, which manages voter-approved funding programs such as Measure T and Measure U. These programs provide a stable, long-term funding source for roadway maintenance, multimodal improvements, corridor enhancements, and projects with resilience co-benefits, including improvements that support emergency operations and evacuation routes. The NVTA - Tax Agency is governed by a 12-member Board representing Napa County's incorporated jurisdictions and the County Board of Supervisors.

NVTA does not use utility fees, stormwater fees, system development fees, or developer impact fees, and it does not issue general obligation bonds or special tax bonds independent of voter-approved measures. However, Measure U includes bonding authority that can help accelerate larger capital projects. NVTA's strongest fiscal capability is its capital programming and grant administration capacity, which allows the agency to coordinate state, federal, and local funding for infrastructure upgrades, fleet modernization, facility improvements, and operational enhancements. These investments support system reliability, continuity of operations, and long-term hazard resilience.

Education & Outreach

NVTA's education and outreach capabilities are primarily focused on transit services, transportation planning, and public information rather than hazard-specific education. However, the agency has several existing communication tools that could be expanded to support hazard awareness and rider preparedness, especially for transportation-dependent populations.

NVTA uses its website, social media platforms, public contact channels, and monthly e-newsletter to share service updates, rider resources, agency news, and operational information. While these platforms are not currently centered on hazard education, they provide a strong foundation for sharing future messaging related to wildfire impacts, PSPS events, extreme heat, flooding, service disruptions, evacuation-related transportation updates, and rider safety. Social media is particularly useful for timely updates during hazard events, allowing NVTA to communicate transit-specific impacts and reinforce County emergency messaging.

NVTA does not currently host standalone public safety events or maintain a formal hazard education program, and hazard materials are not widely distributed at physical public-facing locations. However, the agency could strengthen its outreach role by adding hazard preparedness content to its website and newsletter, providing printed or digital materials at transit facilities, and partnering with Napa County OES, local jurisdictions, Fire Safe Councils, Resource Conservation Districts, and other agencies on preparedness and resilience outreach.

ASSESSMENT LEGEND

HMP Integration

Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Table 11-22: NVTA Capabilities and Opportunities Assessment

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Planning and Regulatory Capabilities				
Hazard Reduction Programs (Annually Conducted)				
Capital Improvements Program (CIP) or Plan				Current projects support planning, resilience, and emergency operations. Coordination with local/state/federal agencies to enhance disaster response.
Annual Fire Prevention Plan				NVTA does not manage facilities that require their own fire prevention plans. Coordination with local fire agencies possible.
Seismic Safety Program (Non-structural)				Seismic retrofits discussed in budget narrative. Some projects potentially funded via FEMA HMA.
Earthquake Modernization Plan (Building Safety)				Facility upgrades and seismic improvements likely embedded in capital planning.
Stormwater Management Program (Annual Inspections)	N/A	N/A	N/A	NVTA is not responsible for stormwater management.
Hazard Plans and Programs				
Floodplain Response Plan				NVTA does not have operational flood response duties; this lies with local jurisdictions. No plan in place for its own operations.
Community Wildfire Protection Plan (CWPP)				Not a wildfire response agency. Some project areas may intersect WUI; future coordination possible.

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Ground Water Management Planning / Plans	N/A	N/A	N/A	NVTA does not oversee groundwater. No planning responsibilities in this area.
Climate Action Plan				NVTA has embedded sustainability and climate adaptation goals in planning documents. Prioritizes low-emission and zero-emission transit systems.
Drought Mgmt/ Contingency Plan	N/A	N/A	N/A	Not applicable to NVTA's mission or operations.
FireWise Communities within District	N/A	N/A	N/A	Not applicable to NVTA's mission or operations.
Hazard-Related Public Outreach Program				No formal program; limited future opportunity within NVTA's purpose and scope
Administrative and Technical				
Staff Capacity				
Emergency Manager				No dedicated EM role; coordination likely via Executive/Deputy Director with County OES.
Civil Engineer				Grant Bailey
Dedicated Public Outreach Personnel				Emily Charrier-Botts, who serves as Communications & Outreach Coordinator, managing the agency's media platforms, public events, emergency messaging, and branded outreach initiatives. The Bilingual Outreach Coordinator is currently (as of September 2025) an open position. When filled, the position, focuses on bilingual (Spanish) community engagement efforts
GIS Specialist and Capability				GIS capabilities likely through planning staff or partnerships; no standalone GIS specialist. A couple of NVTA staff members work with GIS.
Grant Manager, Writer, or Specialist				No dedicated staff member to perform grant writing. Depending on the type of grant, planning staff, finance staff or transit staff write grant applications.
Other	N/A	N/A	N/A	
Warning Systems/Services				

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
General				NVTA provides alerts via its website, www.vinetransit.com, the Transit App, through other third party platforms that ingest General Transit Feed Specification (GTFS), text messages and social media, but relies on Napa County's emergency alert systems for regionwide hazards
Flood				NVTA coordinates route changes and notifications for riders during flood events. Route alerts are published in real time via mobile apps, text messages, its website, and social media.
Wildfire				NVTA does not issue wildfire alerts directly but supports County-led alerts through operational coordination and transit service changes.
Geological Hazards				Earthquake-related safety is addressed in NVTA's continuity and seismic retrofit planning. Coordination with local EOC and real-time updates during seismic events.
Fiscal Capabilities				
Financial Resources for Hazard Mitigation				
Levy for Specific Purposes with Voter Approval				Has taxing authority (Measure U is our current ½ cent sales tax
Utilities Fees	N/A	N/A	N/A	Not a utility provider
System Development Fee				Not within authority; potential future opportunity with municipal partnerships
General Obligation Bonds to Incur Debt				NVTA issues regional bonds via Measure U but lacks powers for GO bonds; financing limited to capital projects.
Special Tax Bonds to Incur Debt	N/A	N/A	N/A	Does not have authority to issue special tax bonds.
Withheld Spending in Hazard-Prone Areas				No policy to withhold or reallocate spending based on hazard risk exists.
Stormwater Service Fees	N/A	N/A	N/A	Not a stormwater service provider
Capital Improvement Project Funding				24-25 Budget
Education / Outreach Capabilities				

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Education/Outreach Resources				
Website Dedicated to Hazard Topics				NVTA's main site includes general emergency info, but not specifically about hazards. Could expand to include wildfire, PSPS, and climate readiness.
Dedicated Social Media				NVTA is active on platforms like Facebook, instagram, and X, which can be leveraged for hazard alerts and rider outreach
Hazard Info. Avail. at Library/ Planning Desk				No direct indication of hazard info at physical sites; could be implemented at the transit office or county library kiosks.
Annual Public Safety Events				NVTA does not currently host public safety events but could collaborate with County OES or city events to promote transit safety during hazards.
Ability to Field Public Tech. Assistance Requests				NVTA accepts public input through email/contact forms. Tech assistance specific to hazard planning is not yet formalized.
Public Safety Newsletters or Printed Outreach				No newsletter currently; future opportunity
Fire Safe Councils				NVTA is not a member of Fire Safe Councils, but could collaborate with local FSCs for evacuation planning or fuel break coordination.
Resource Conservation Districts				No direct collaboration noted with Napa RCD. Possible future partner for wildfire resilience and slope stabilization near transit routes.
Other	N/A	N/A	N/A	

11.6.2 Napa Valley Transportation Authority Mitigation Action Plan

NVTA's mitigation actions were developed through a collaborative process informed by the updated risk assessment, local priorities, and extensive stakeholder engagement. As part of this 2026 MJHMP update, the NVTA reviewed mitigation actions from its prior Local Hazard Mitigation Plan to determine which actions to carry forward, which to consolidate, and where entirely new strategies were required. This careful evaluation ensured that the updated action plan builds upon past commitments while also responding to current risks and future challenges.

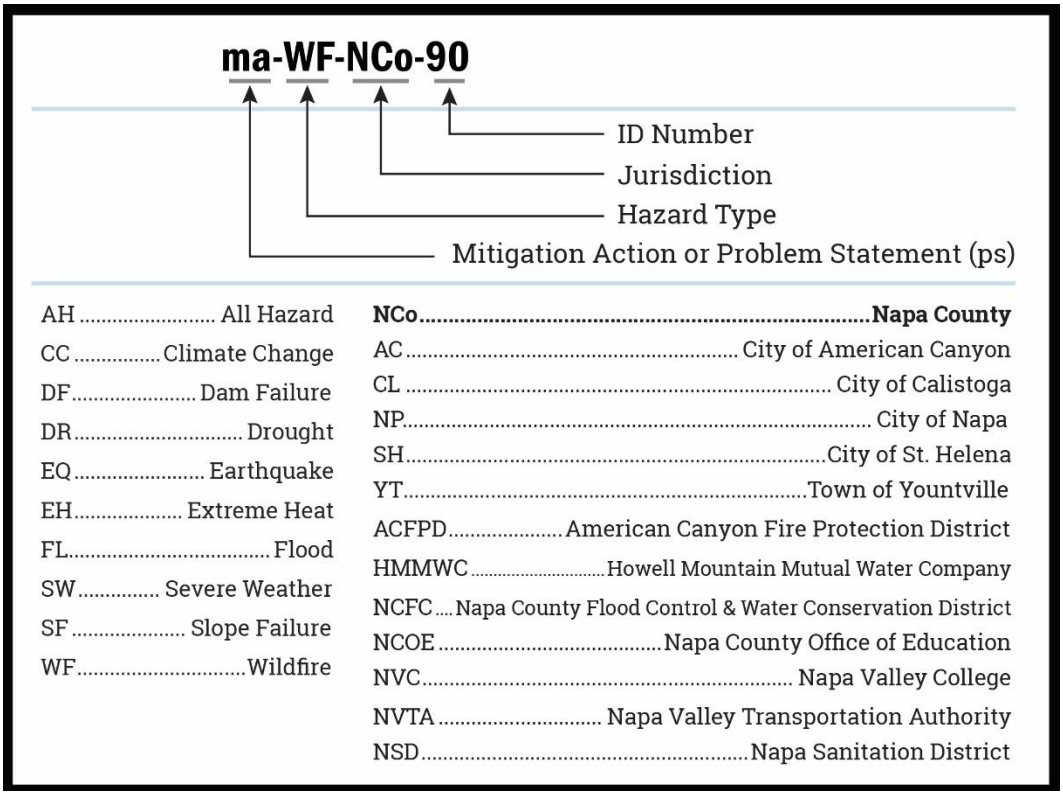


Figure 11-10: Mitigation Action Number Key

The plan addresses NVTA's most significant hazards, including wildfire, earthquake, flood, drought, and climate change. Each mitigation action is designed to align with FEMA's hazard mitigation guidance and the requirements of the Disaster Mitigation Act of 2000. Where appropriate, overlapping or redundant actions were consolidated into broader, more comprehensive strategies that improve clarity, increase feasibility, and strengthen regional coordination.

The mitigation action prioritization method used by all participating jurisdictions is described in Volume 1, Section 4. Each action specific to NVTA is documented in Table 11-23, which identifies the responsible department, implementation timeframe, potential funding sources, and resources required to complete the action. Each action is also assigned a unique alphanumeric identifier (see Figure 11-10) that links the strategy to its associated hazard and supports consistent monitoring and reporting.

NVTA's approach recognizes that some hazards are most effectively addressed through regional efforts. Flood protection, drought resilience, and wildfire risk reduction often extend beyond the district's boundaries and require collaboration with county, regional, and state partners. By aligning local actions with regional strategies, NVTA helps to consolidate resources, maximize funding opportunities, and ensure that

mitigation projects achieve the greatest benefit for San Pablo Bay, the Napa Valley, and the wider Napa County community.

Collectively, these mitigation actions provide a roadmap for reducing hazard risk, protecting vulnerable populations, and strengthening the long-term resilience of NVTA.

Table 11-23: NVTA Mitigation Action Plan

Mitigation No.	Hazard Type	Sub-Hazard	Mitigation Type	Year	Primary Agency	Title	Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Problem Statements
ma-AH-NVTA-002	All Hazard		SP , PRV	2026	Napa Valley Transportation Authority	Enhance Backup Power & Communication Systems	Assess feasibility of installing a microgrid, battery storage, or additional backup power, and redundant communication systems at key NVTA facilities to ensure service continuity during extended outages, including systems that can support electric bus charging. Pursue funding, design, and installation for selected solution(s).	Administration	High	High	5-10 Years	Project	HMGP / BRIC , General Fund	Medium	ps-WF-NVTA-003, ps-EH-NVTA-003, ps-EQ-NVTA-334, ps-AH-NVTA-333, ps-EQ-NVTA-001, ps-EQ-NVTA-334, ps-FL-NVTA-001, ps-FL-NVTA-002, ps-EH-NVTA-001, ps-SF-NVTA-001, ps-SF-NVTA-002, ps-WF-NVTA-001, ps-WF-NVTA-002
ma-AH-NVTA-001	All Hazard		PRV	2026	Napa Valley Transportation Authority	Develop Continuity of Operations Plan	Work with the TSA to create and adopt a Continuity of Operations Plan (COOP) specific to NVTA?s transit operations in the event of major natural disaster(s) that can hamper the agency?s ability operate normal service.	Administration	Low	Medium	1-3 Years	Capacity / Capability Building	HMGP / BRIC , General Fund	High	ps-AH-NVTA-002, ps-CC-NVTA-001, ps-EQ-NVTA-001, ps-EQ-NVTA-334, ps-SF-NVTA-001, ps-SF-NVTA-002, ps-WF-NVTA-001
ma-AH-NVTA-002	All Hazard		ES , PE&A	2026	Napa Valley Transportation Authority	Improve Bus Alert Systems	Develop and deploy an integrated emergency communication system that includes digital signage to help deliver timely hazard notifications to riders.	Administration	Medium	Low	3-5 Years	Project	HMGP / BRIC , General Fund	Low	ps-WF-NVTA-003, ps-EH-NVTA-003, ps-EQ-NVTA-334, ps-AH-NVTA-333, ps-EQ-NVTA-001, ps-EQ-NVTA-334, ps-FL-NVTA-001, ps-FL-NVTA-002, ps-EH-NVTA-001, ps-SF-NVTA-001, ps-SF-NVTA-002, ps-WF-NVTA-001, ps-WF-NVTA-002
ma-CC-NVTA-001	Climate Change		PRV	2026	Napa Valley Transportation Authority	Climate-Ready Transit Infrastructure Assessment	Conduct a system-wide audit to assess and prioritize upgrades for infrastructure vulnerable to climate stressors (heat, flooding, wildfire). Integrate findings into capital improvement planning.	Administration	Low	Medium	1-3 Years	Project	HMGP / BRIC , General Fund , SMART	Medium	ps-WF-NVTA-001, ps-SF-NVTA-001, ps-EH-NVTA-001, ps-FL-NVTA-002, ps-CC-NVTA-001
ma-EH-NVTA-001	Extreme Heat		SP	2026	Napa Valley Transportation Authority	Bus Stop Shelter Expansion	In collaboration with the right-of-way and property owners, identify locations for bus stop shelters or other passive cooling measures to mitigate rider heat exposure. Install shelters or other measures at the most vulnerable and equitable stops.	Administration	High	High	3-5 Years	Project	HMGP / BRIC , General Fund , SMART	Medium	ps-EH-NVTA-002, ps-EH-NVTA-001, ps-CC-NVTA-001
ma-FL-NVTA-001	Flood		SP	2026	Napa Valley Transportation Authority	Drainage Improvements for Bus Stops & Operations Center	In collaboration with the right-of-way and property owners, assess bus routes and stops for drainage and flooding issues. Implement mitigation measures at vulnerable, high-volume bus stops and evaluate retrofits and drainage improvements for NVTA Operations Center to ensure resilience against flooding.	Administration	High	High	3-5 Years	Project	HMGP / BRIC , General Fund , SMART	High	ps-SF-NVTA-001, ps-SF-NVTA-002, ps-CC-NVTA-001, ps-FL-NVTA-001, ps-FL-NVTA-002
ma-WF-NVTA-001	Wildfire		SP , PRV	2026	Napa Valley Transportation Authority	Enhance Vehicle Air Quality & Cooling Systems	Upgrade bus ventilation, filtration, and cooling systems to better protect drivers and passengers from extreme heat and smoke impacts during wildfire events.	Administration	Medium	Medium	3-5 Years	Project	HMGP / BRIC , General Fund , SMART	Medium	ps-WF-NVTA-002, ps-WF-NVTA-001, ps-EH-NVTA-001, ps-CC-NVTA-001

Napa County

Multi-Jurisdictional Hazard Mitigation Plan Update

2026

Section 12. Napa Sanitation District

VOLUME 2
JURISDICTIONAL ANNEXES

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Napa County

2026 Multi-Jurisdictional Hazard Mitigation Plan Update

Napa Sanitation District (NSD)

Special District Annex

Section 12. Napa Sanitation District 12-7

12.1 Scope & Purpose 12-7

12.2 Jurisdictional Setting 12-7

12.2.1 Geography & Climate 12-8

12.2.2 Demographics & Vulnerable Populations 12-11

12.2.3 Economy 12-23

12.2.4 Growth Trends & Future Development 12-23

12.3 Planning Process 12-24

12.3.1 Public Input & Draft Review 12-26

12.4 What's New 12-27

12.4.1 Mitigation Activities 12-27

12.4.2 Mitigation Successes 12-28

12.5 Risk Assessment 12-30

12.5.1 Hazard Screening & Prioritization 12-31

12.5.2 Vulnerability to Specific Hazards 12-35

12.5.3 Climate Change Impacts & Vulnerable Populations 12-52

12.5.4 Hazard Problem Statements 12-52

12.6 Mitigation Strategy 12-55

12.6.1 Capabilities & Opportunities 12-56

12.6.2 Napa Sanitation District Mitigation Action Plan 12-66

List of Figures

Figure 12-1: NapaSan Geographic Overview Map 12-10
Figure 12-2: NapaSan Median Household Income Map 12-12
Figure 12-3: NapaSan Poverty Status Map 12-13
Figure 12-4: NapaSan Housing Occupancy Map 12-14
Figure 12-5: NapaSan Dependent Age Groups Map 12-16
Figure 12-6: NapaSan Disabled Elderly Map 12-17
Figure 12-7: NapaSan Race and Ethnicity Map 12-19
Figure 12-8: NapaSan Spanish-Speaking Households Map 12-20
Figure 12-9: NapaSan CDC Social Vulnerability Index Map 12-22
Figure 12-10: NapaSan Linear Generator Install 12-29
Figure 12-11: Collection System Rehabilitation Project 12-30
Figure 12-12: NapaSan Risk Assessment Matrix 12-33
Figure 12-13: Exposure Summary – NapaSan Wildfire Risk 12-37
Figure 12-14: Exposure Summary – NapaSan Earthquake Risk (M7.1 Hunting Creek–Berryessa) 12-40
Figure 12-15: Exposure Summary – NapaSan Earthquake Risk (M6.7 West Napa) 12-41
Figure 12-16: Exposure Summary – NapaSan Liquefaction Risk 12-42
Figure 12-17: NapaSan Flood Risk (FEMA and DWR Awareness Zones) 12-44
Figure 12-18: Exposure Summary – NapaSan Flood Risk (FEMA Zones) 12-45
Figure 12-19: Drought Severity Timeline 2000-2026 12-48
Figure 12-20: Exposure Summary – NapaSan Sea Level Rise 12-51
Figure 12-21: Mitigation Action Number Key 12-66

List of Tables

Table 12-1: NapaSan Planning Team and Steering Group Members 12-25
Table 12-2: NapaSan Planning Team Meetings 12-26
Table 12-3: NapaSan Document Review of Potential Hazards 12-32
Table 12-4: NapaSan Hazards Prioritization Summary 12-34
Table 12-5: Drought Classifications and Impacts 12-47
Table 12-6: NapaSan Hazard Problem Statements 12-53
Table 12-7: NapaSan Capabilities and Opportunities Assessment 12-62
Table 12-8: NapaSan Mitigation Action Plan 12-68

Adoption Resolution

To comply with the Federal Disaster Mitigation Act of 2000 (DMA 2000), the Napa Sanitation District Board of Directors has officially adopted this 2026 Napa County Multi-Jurisdictional Hazard Mitigation Plan, including Volume 1 in its entirety as well as this Volume 2 municipal annex. The adoption of the MJHMP recognizes the district's commitment to reducing the impacts of natural hazards within its jurisdiction and across Napa County.

A copy of the district's adoption record is provided on the following pages. Adoption records for all jurisdictions are summarized in Volume 1, Table ES-1.

ADOPTION RECORD TO BE INSERTED UPON COMPLETION.

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Section 12. Napa Sanitation District

12.1 Scope & Purpose

This Jurisdictional Annex for the Napa Sanitation District (NapaSan) of the 2026 Napa County Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) details the hazard mitigation planning elements specific to the district's planning area. The annex is not intended to be a standalone document but appends to and supplements the information contained in the umbrella plan document (Volume 1). As such, all sections of the umbrella plan, including the planning process and other procedural requirements, apply to and were met by the district. This annex provides additional information specific to the district, with a focus on hazard identification and risk assessment, vulnerability assessment, problem statements, mitigation strategy, and capabilities assessment. Below are NapaSan's Points of Contact:

Primary Point of Contact	Alternate Point of Contact
Matthew Lemmon, Engineering Director / District Engineer Napa Sanitation District 1515 Soscol Ferry Road Napa, CA 94558 Telephone: (707) 258-6000 email: mlemmon@napasan.com	Amy Walcker, Human Resources Manager Napa Sanitation District 1515 Soscol Ferry Road Napa, CA 94558 Telephone: (707) 258-6000 email: awalcker@napasan.com

12.2 Jurisdictional Setting

NapaSan is an independent special district that provides wastewater collection, treatment, recycled water supply, and biosolids management services within southern Napa County. NapaSan's service area encompasses approximately 21 square miles, primarily serving the City of Napa, the Silverado Country Club area, the Napa County Airport, and several adjacent unincorporated areas of Napa County. NapaSan treats an average of approximately 10 million gallons per day (MGD) of wastewater, with facilities designed to accommodate both dry-weather and peak wet-weather flows.

NapaSan is governed by a Board of Directors and operates as a regional wastewater utility responsible for protecting public health, water quality, and environmental resources. As a publicly owned treatment works (POTW), NapaSan plays a critical role in regional infrastructure resilience, regulatory compliance, and emergency response coordination related to wastewater services. NapaSan's mission emphasizes reliable service delivery, environmental stewardship, and regulatory compliance while proactively managing operational and climate-related risks.

NapaSan's service area is located within the lower Napa River watershed and includes areas adjacent to the Napa River, Soscol Creek, and associated floodplains. Portions of the District's facilities and conveyance

infrastructure are situated at relatively low elevations near tidal influences, making them susceptible to flooding, sea level rise, groundwater rise, and access constraints during extreme weather events. The district's oxidation ponds and biosolids application sites occupy large tracts of land in areas influenced by hydrology, soil conditions, and seasonal groundwater variability.

NapaSan's primary operational facilities are centered at the Soscol Water Recycling Facility, located at 1515 Soscol Ferry Road, just south of State Route 29. This complex includes the wastewater treatment plant (WWTP), administration buildings, oxidation ponds, electrical systems, and support infrastructure. The WWTP provides secondary and tertiary treatment, with a permitted average dry-weather discharge capacity of 15.4 MGD and peak wet-weather treatment capacity of approximately 23 MGD. Treated effluent is either discharged to the Napa River during the winter season or reused as recycled water during the dry season, consistent with Title 22 recycled water standards.

In addition to the treatment complex, NapaSan owns and operates an extensive network of collection system pipelines, recycled water distribution pipelines, multiple remote pump stations, recycled water booster pump and truck fill stations, and biosolids application sites distributed throughout the service area. These assets span urban, agricultural, and low-lying riverine environments, resulting in varying exposure to flood, wildfire, seismic, and climate-related hazards.

NapaSan's location within Napa County and the State of California are shown in Figure 12-1.

- **Year of Incorporation:** November 1945
- **Number of connections:** ~33,000
- **Service area:** ~21–23 square miles
- **Average wastewater treated:** ~10 MGD

12.2.1 Geography & Climate

NapaSan's service area is located in southern Napa County, primarily within and adjacent to the City of Napa, and encompasses approximately 23 square miles. The district lies within the lower Napa River watershed, with key facilities situated near the confluence of Soscol Creek and the Napa River. The district's primary operational facilities, including the Soscol Water Recycling Facility, oxidation ponds, and administrative headquarters, are located in relatively low-lying terrain south of downtown Napa, near tidal reaches of the Napa River. Figure 12-1 provides a regional location map showing NapaSan's jurisdictional boundaries for sanitation services (recycled water boundary not shown).

NapaSan's geographic footprint includes a mix of urbanized areas, agricultural lands, and open space, with infrastructure extending across floodplains, valley floors, and gently sloping terrain. Portions of the collection system, pump stations, and recycled water infrastructure are located near riverine and tidal environments, while biosolids application sites are generally situated in rural agricultural areas.

The Napa River is a dominant geographic feature influencing NapaSan's operations. River stages in the lower watershed are affected by both upstream watershed runoff and tidal influences from San Pablo Bay, resulting in fluctuating water surface elevations. Tidal variation near NapaSan facilities can exceed 4 feet

between low and high tide, which, when combined with storm events, increases the potential for localized flooding and access challenges.

NapaSan is located in a Mediterranean climate zone, characterized by cool, wet winters and warm, dry summers. Most of the annual precipitation occurs between November and April, which coincides with NapaSan's winter river discharge operational period. Average daily wastewater flows increase significantly during wet weather due to stormwater inflow and infiltration (I&I), placing added stress on collection and treatment infrastructure. The City of Napa and surrounding lower Napa Valley typically receive approximately 24 to 28 inches of rainfall annually, with year-to-year variability driven by atmospheric river events and broader climate cycles. Most rainfall occurs during winter storm events, while summers are generally dry with little to no precipitation. This seasonal concentration of rainfall aligns with NapaSan's winter river discharge operational period.

Summer months are typically dry, with minimal rainfall and elevated temperatures. Periods of high heat coincide with peak recycled water demand for agricultural irrigation, landscaping, and golf courses served by NapaSan's recycled water system. These seasonal climate patterns create a strong operational dependency on both precipitation timing and temperature extremes.

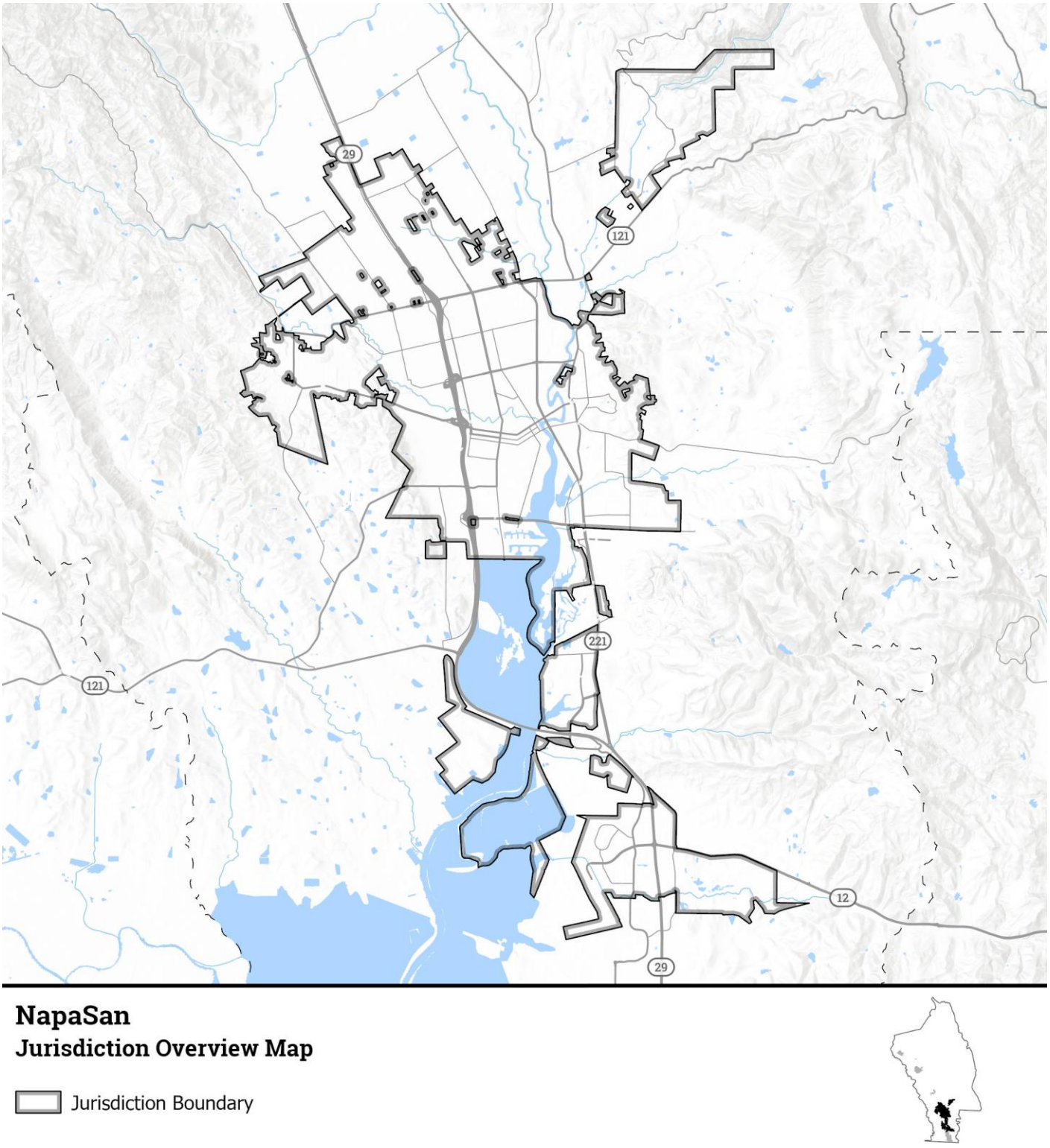


Figure 12-1: NapaSan Geographic Overview Map

12.2.2 Demographics & Vulnerable Populations

NapaSan provides wastewater collection, treatment, and recycled water services primarily to the City of Napa and adjacent unincorporated areas of Napa County. The service area includes a predominantly urban population, with additional agricultural, industrial, commercial, and tourism-related land uses that contribute to daily and seasonal variations in service demand.

As a special district, NapaSan does not directly manage population or land use; however, reliable wastewater services are essential to public health and community resilience. Certain groups within the service area may be more vulnerable to disruptions caused by natural hazards, including low-income households, older adults and individuals with disabilities, residents of multi-family housing, and critical facilities such as schools, healthcare facilities, and care homes.

Service interruptions during flood, wildfire, heat, or seismic events may disproportionately affect these populations by increasing health risks and delaying recovery. NapaSan's hazard mitigation, capital improvement, and climate adaptation efforts support community resilience by prioritizing continuity of operations and protecting essential wastewater infrastructure serving vulnerable populations.

12.2.2.1 Income & Housing

NapaSan service area includes communities with a wide range of household income and housing characteristics, largely reflecting patterns within the City of Napa and surrounding unincorporated areas. ACS data indicate that median household income varies substantially across the service area, with higher-income households more prevalent in peripheral and hillside areas, and lower-income households concentrated in portions of central and southern Napa. See Figure 12-2

As shown in Figure 12-3, areas with higher poverty rates are primarily located in the central and southern portions of the service area, including neighborhoods near the Napa River and major transportation corridors. These areas may be more sensitive to service disruptions and recovery delays following hazard events due to limited financial resources.

Housing occupancy patterns in Figure 12-4 also vary across the NapaSan service area. Owner-occupied housing is more common in outlying residential areas, while lower rates of homeownership and higher renter occupancy are concentrated in central Napa. Higher renter concentrations may indicate increased vulnerability during disasters, as renters often have fewer resources, less control over building resilience measures, and greater displacement risk.

Overall, the income and housing patterns within NapaSan's service area highlight the importance of maintaining reliable wastewater services during and after hazard events, particularly in neighborhoods with lower incomes, higher poverty rates, and greater renter occupancy, where public health and recovery challenges may be more pronounced.

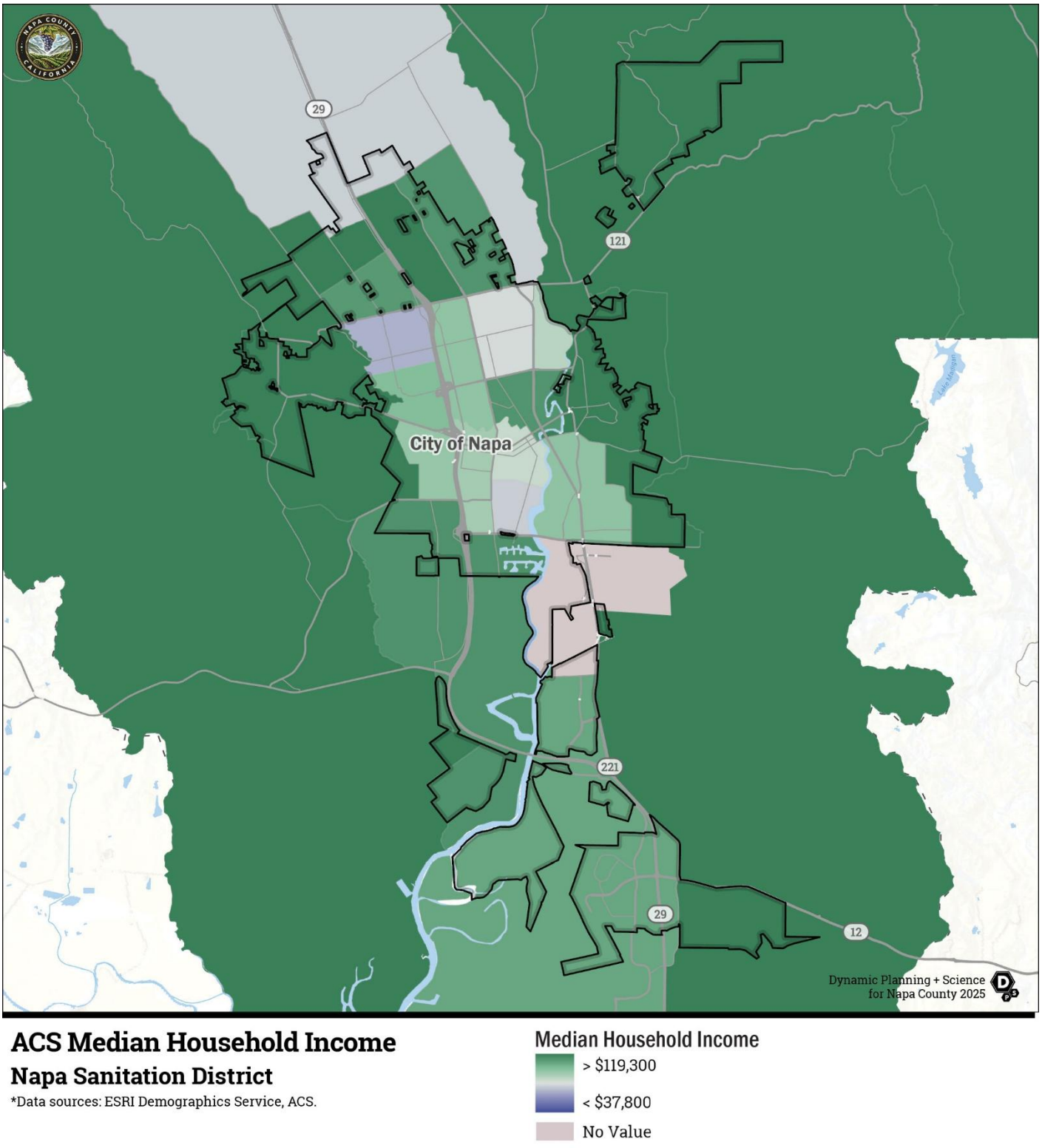


Figure 12-2: NapaSan Median Household Income Map

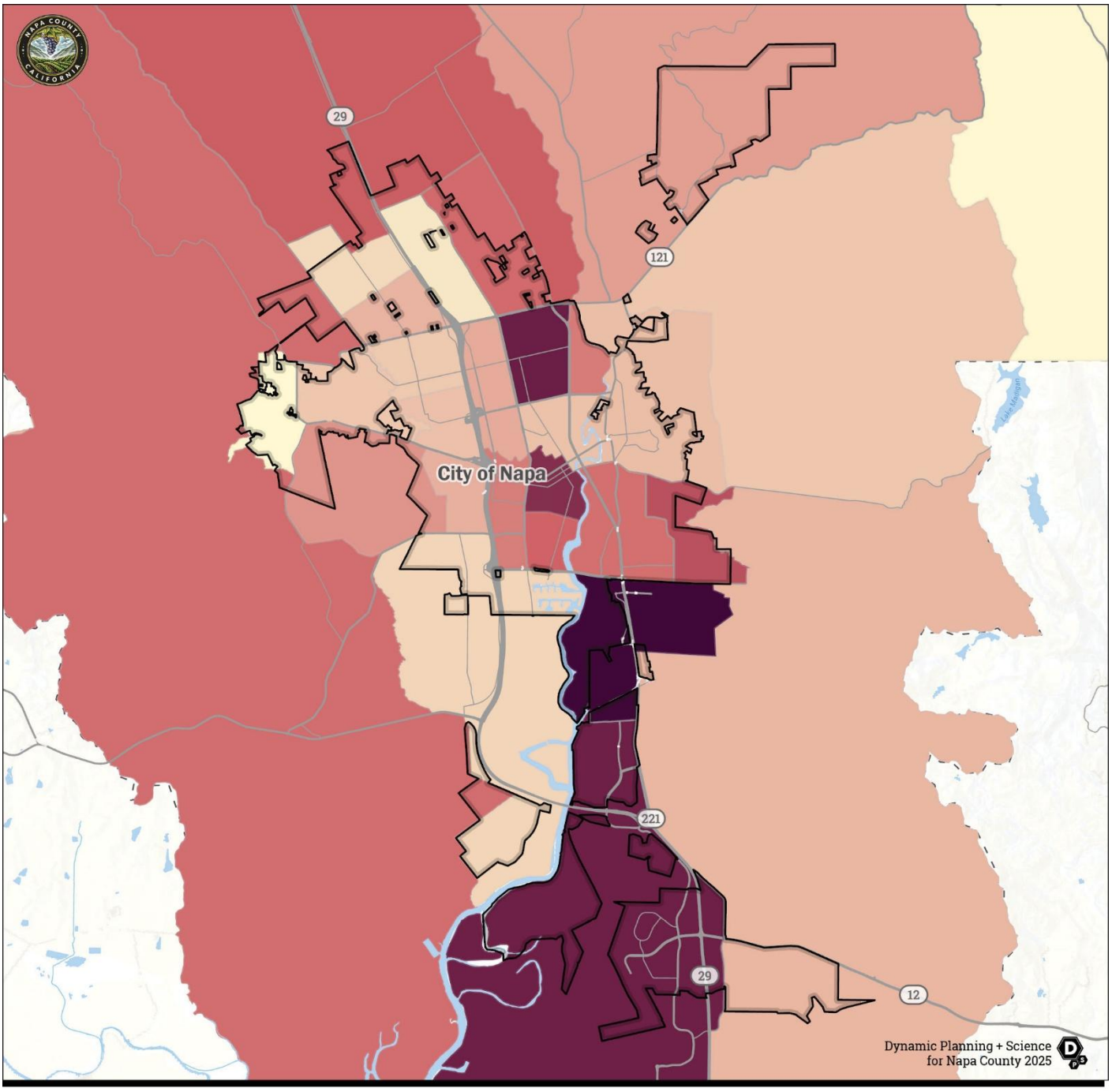


Figure 12-3: NapaSan Poverty Status Map

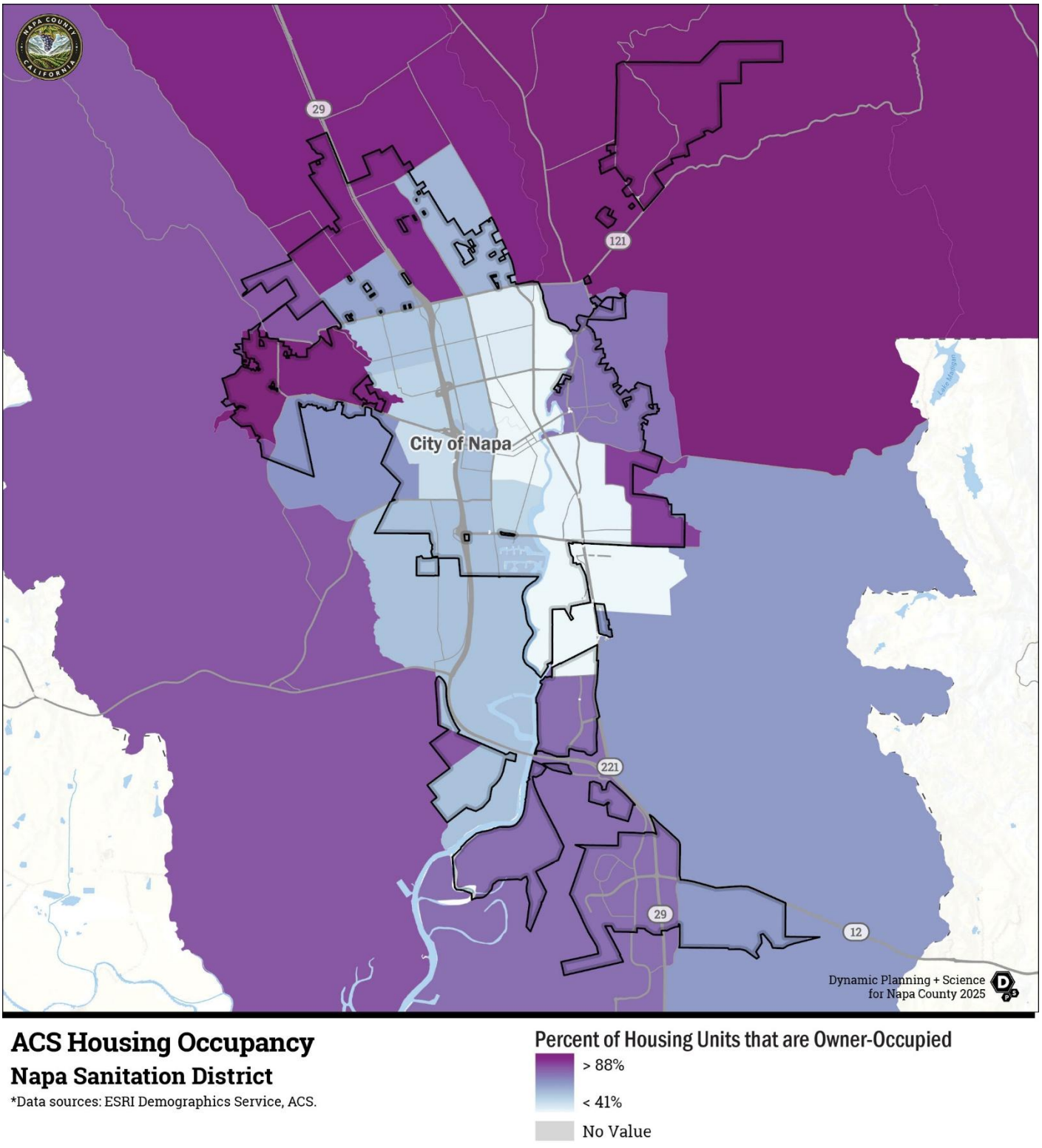


Figure 12-4: NapaSan Housing Occupancy Map

12.2.2.2 Dependent & Disabled Populations

NapaSan's service area and Figure 12-5, includes neighborhoods with higher concentrations of dependent age groups, including children and older adults, primarily within central and southern portions of the City of Napa. These areas generally correspond with more urbanized neighborhoods near the Napa River and major transportation corridors.

ACS data and Figure 12-6, also indicate elevated proportions of elderly residents (65+) with disabilities in parts of the southern service area and select central neighborhoods. Individuals in these populations may have increased reliance on uninterrupted sanitation services, limited mobility during evacuations, and greater sensitivity to public health impacts resulting from service disruptions.

While NapaSan does not directly provide social or emergency services, maintaining reliable wastewater collection and treatment during hazard events is critical to protecting dependent and disabled populations, particularly during flooding, extreme heat, wildfire smoke events, and seismic emergencies. NapaSan's emphasis on infrastructure reliability and continuity of operations supports community resilience for residents with limited adaptive capacity.

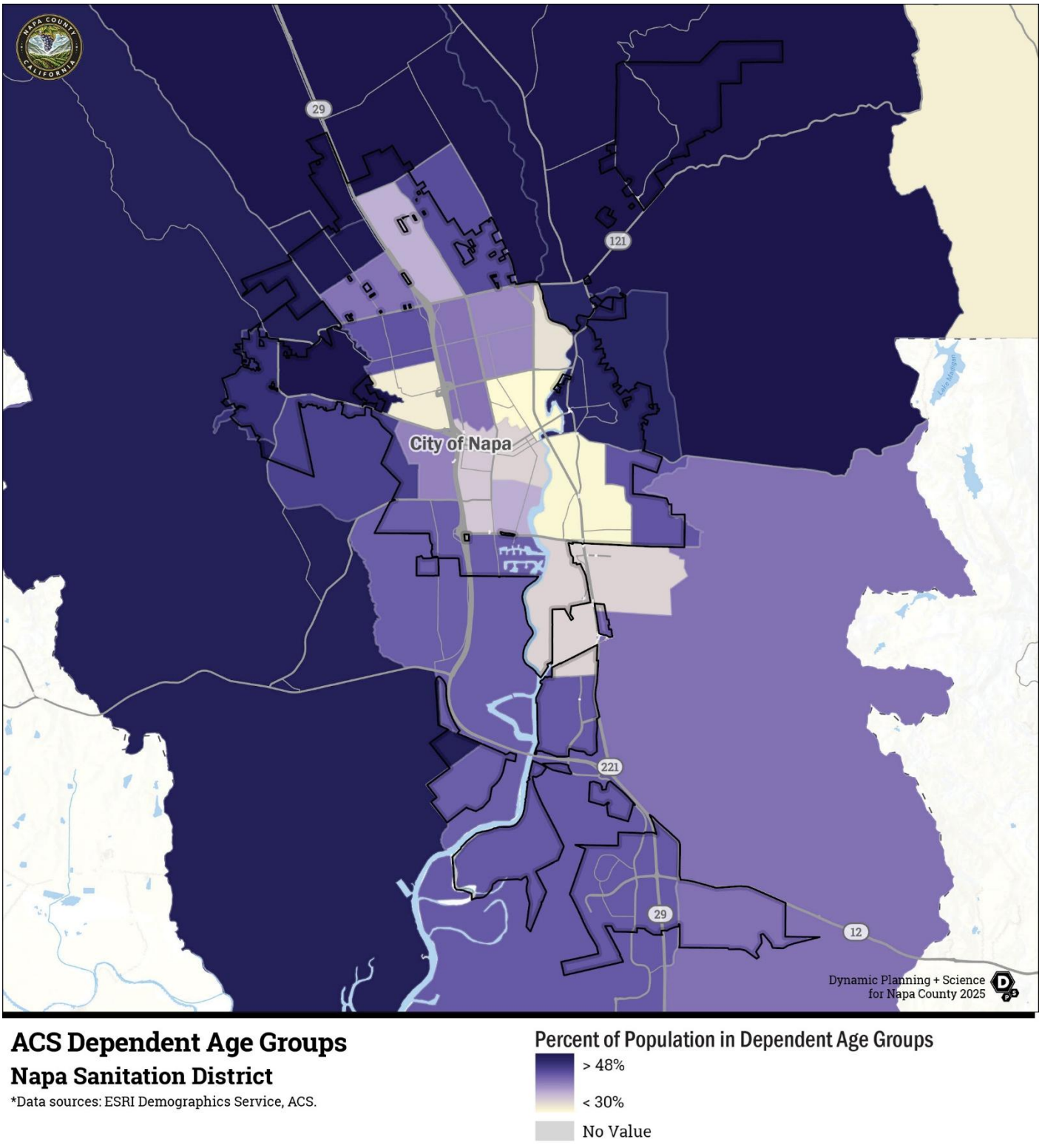


Figure 12-5: NapaSan Dependent Age Groups Map

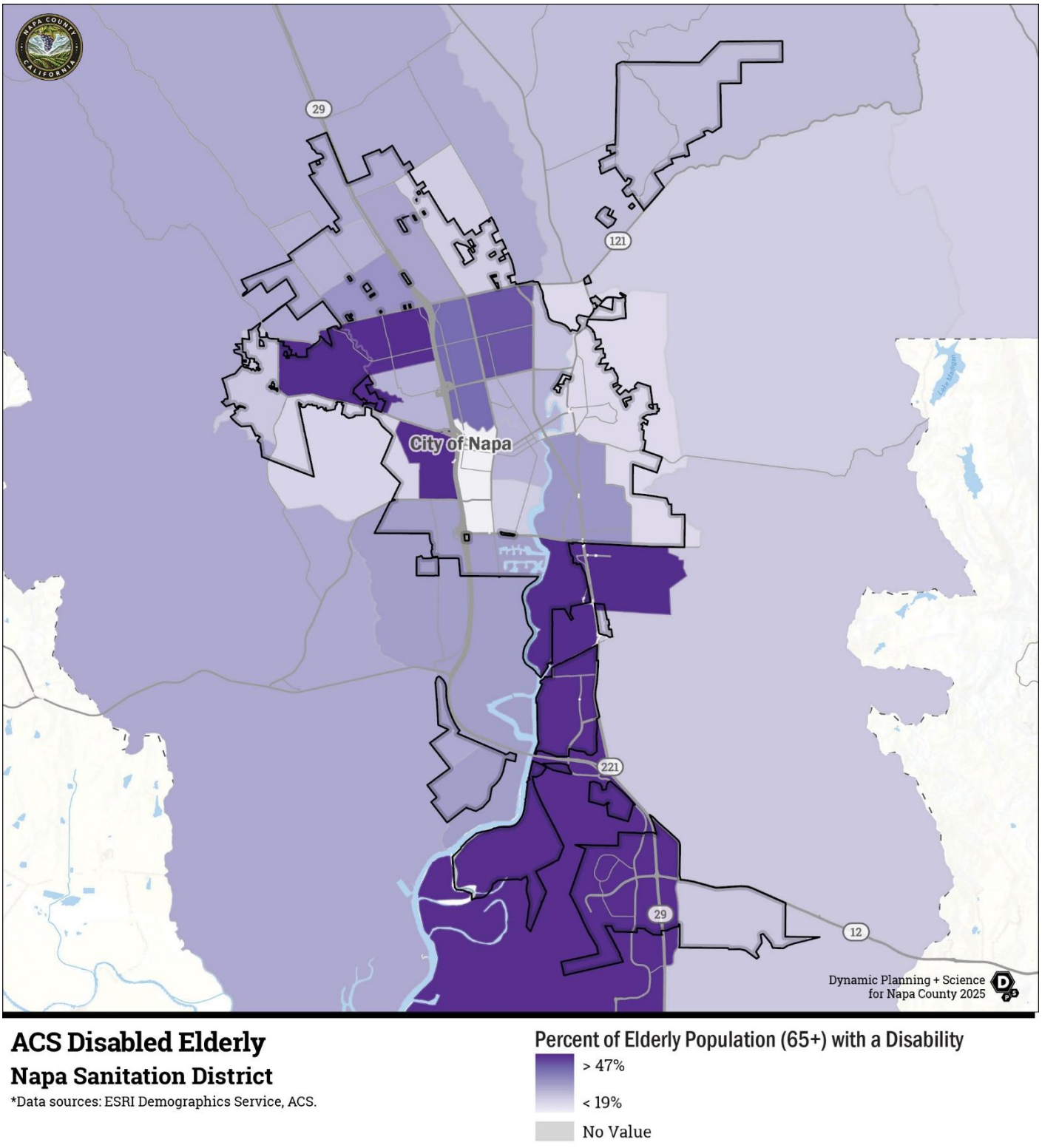


Figure 12-6: NapaSan Disabled Elderly Map

12.2.2.3 Race, Ethnicity & Language

NapaSan's service area encompasses a racially, ethnically, and linguistically diverse population, largely reflecting demographic patterns within the City of Napa and surrounding unincorporated areas. ACS data indicate that while some portions of the service area are predominantly non-Hispanic White, other neighborhoods, particularly in central and southern Napa, have higher concentrations of Hispanic or Latino residents, along with smaller but notable populations of Asian, Black or African American, and other racial and ethnic groups

Figure 12-7 shows ethnic diversity is most pronounced in the urban core and river-adjacent areas, which also tend to overlap with neighborhoods experiencing higher renter occupancy, lower median household incomes, and greater concentrations of dependent or vulnerable populations. These areas may face compounded challenges during hazard events due to economic constraints, housing density, and limited access to resources.

Language data further indicate that Spanish is commonly spoken at home in several parts of the NapaSan service area, with some census tracts showing more than one-third of residents age five and older speaking Spanish at home, Figure 12-8. Households with limited English proficiency may experience barriers to accessing emergency information, understanding public health advisories, or navigating recovery assistance following disasters.

While NapaSan does not provide direct emergency communications or social services, awareness of racial, ethnic, and language diversity within the service area supports more inclusive hazard mitigation planning. Coordination with Napa County, the City of Napa, and community partners helps ensure that critical information related to wastewater service disruptions, public health protection, and recovery efforts can be effectively communicated to all residents, including linguistically isolated populations.

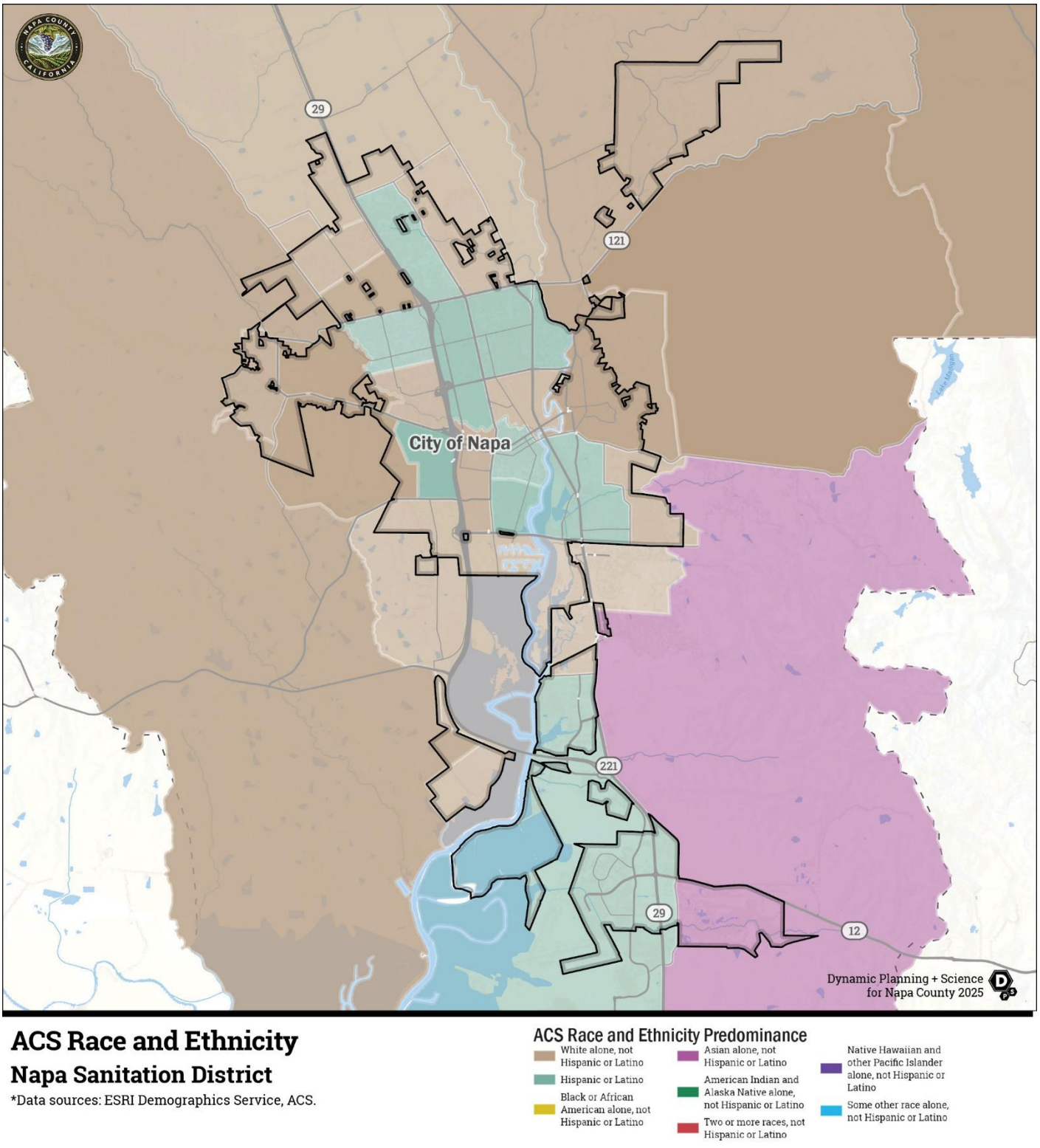


Figure 12-7: NapaSan Race and Ethnicity Map

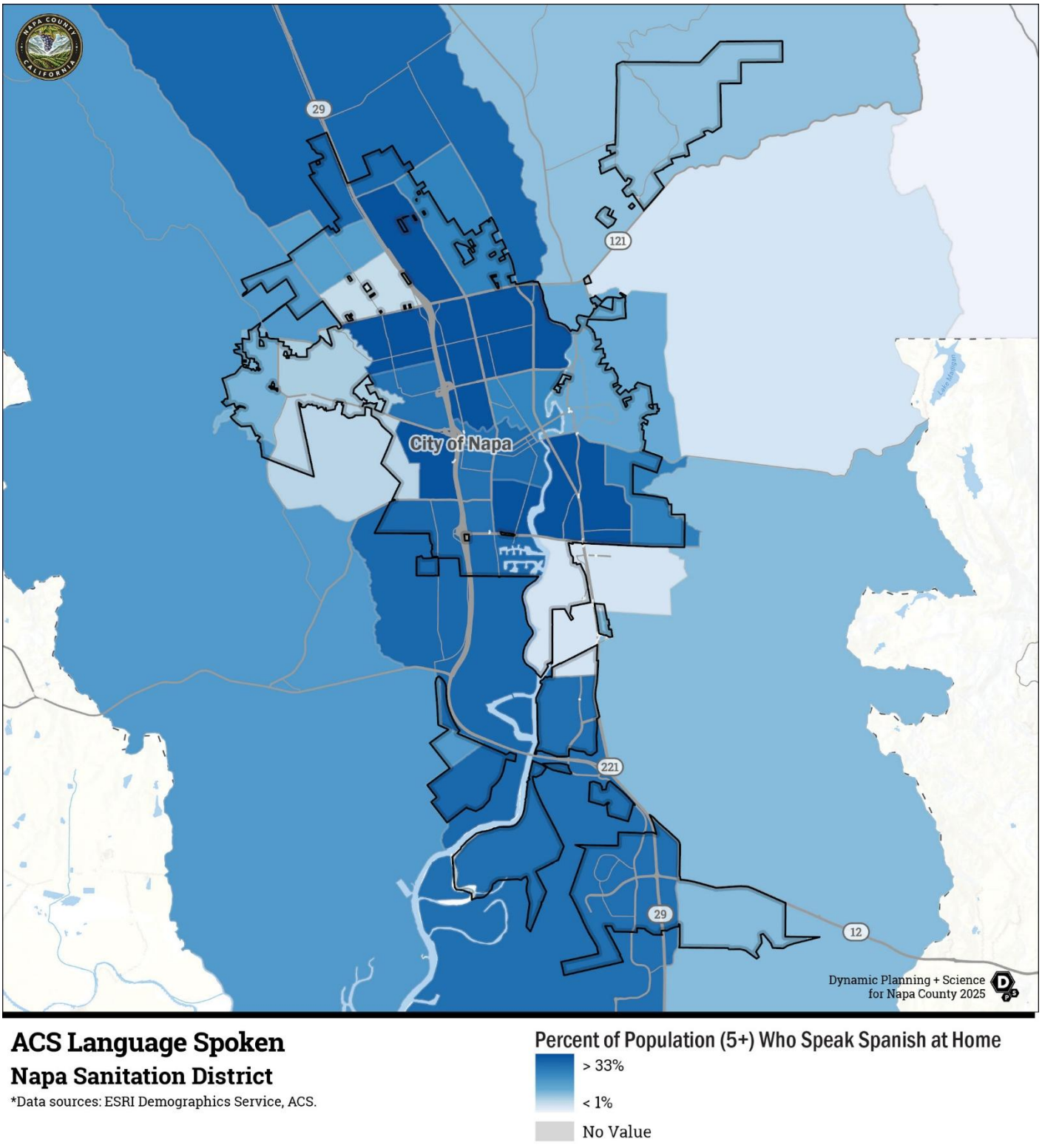


Figure 12-8: NapaSan Spanish-Speaking Households Map

12.2.2.4 Social Vulnerability Index (SVI)

The Centers for Disease Control and Prevention (CDC) Social Vulnerability Index (SVI) for NapaSan reveals important spatial and demographic patterns that have direct implications for equitable hazard mitigation planning. As discussed in detail in Volume 1, Section 1.4.3.6, the SVI is a composite measure developed by the CDC to identify communities that are more likely to require support before, during, and after a disaster. It incorporates a range of factors across four key dimensions: socioeconomic status, household composition and disability, minority status and language, and housing type and transportation access. The resulting index score ranges from 0 (lowest vulnerability) to 1 (highest vulnerability).

SVI mapping indicates that moderate to high social vulnerability is concentrated in central and southern portions of the service area, primarily within the urban core of the City of Napa and along the Napa River corridor, Figure 12-9. These areas generally correspond with neighborhoods that have higher renter occupancy, lower median household incomes, greater proportions of dependent age groups, higher rates of disability among older adults, and increased linguistic isolation.

Areas with lower social vulnerability are more common in outlying residential and less densely developed portions of the service area. These neighborhoods tend to have higher household incomes, greater homeownership rates, and fewer socioeconomic barriers that can complicate disaster preparedness and recovery.

While NapaSan does not provide direct emergency response or social services, SVI patterns are relevant to hazard mitigation planning because wastewater service disruptions can disproportionately affect socially vulnerable populations. Maintaining reliable wastewater collection, treatment, and recycled water operations during hazard events is critical to protecting public health in higher-SVI areas, where residents may have fewer resources to cope with service interruptions or prolonged recovery periods. Awareness of SVI conditions supports coordination with Napa County, the City of Napa, and community partners to ensure mitigation investments and continuity-of-operations planning account for populations with reduced adaptive capacity.

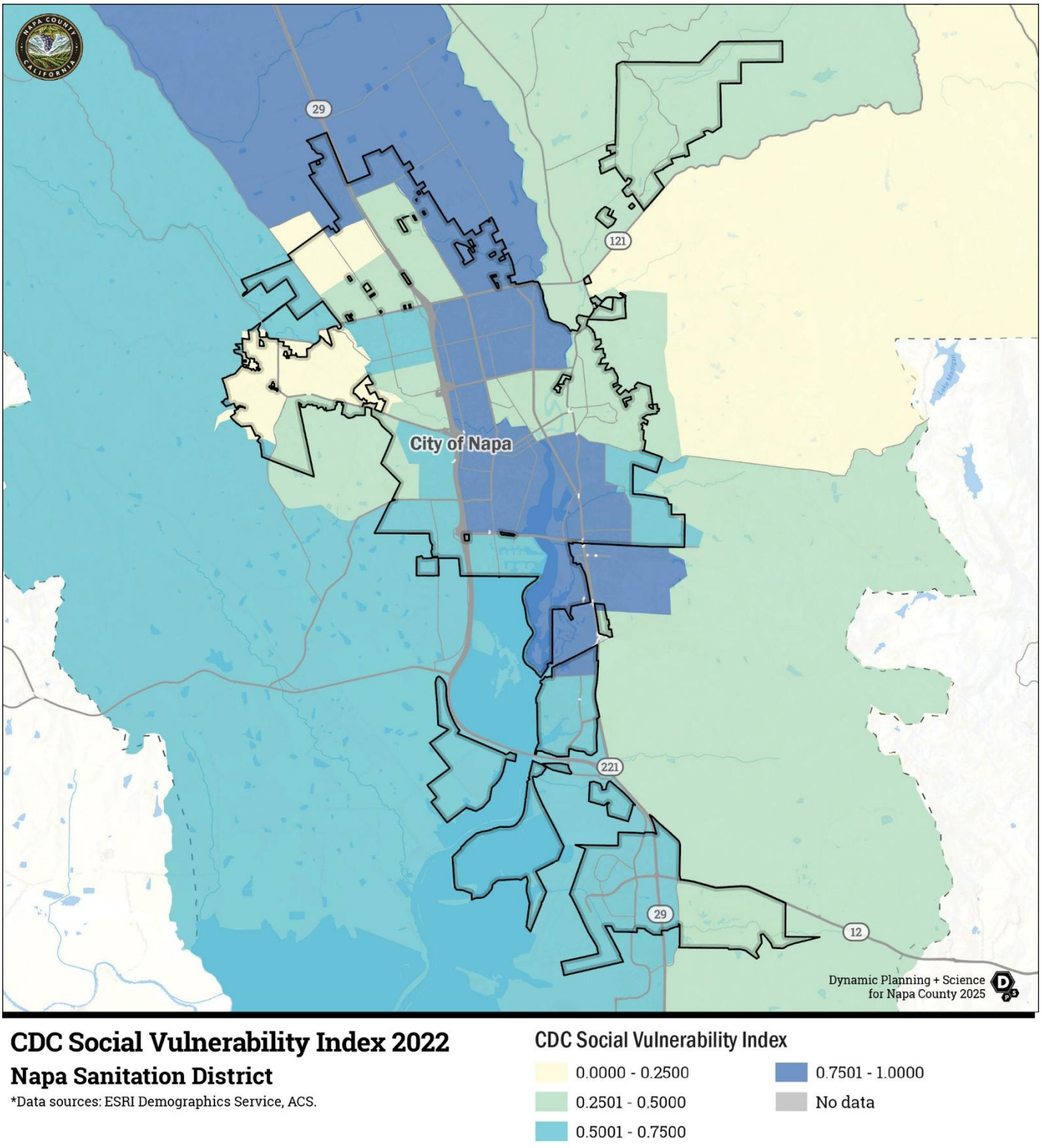


Figure 12-9: NapaSan CDC Social Vulnerability Index Map

12.2.3 Economy

NapaSan serves a service area with a diverse and regionally significant economy, centered primarily within the City of Napa and adjacent unincorporated areas of southern Napa County. The local economy is shaped by a combination of tourism, agriculture, hospitality, healthcare, manufacturing, and professional services, all of which depend on reliable wastewater collection, treatment, and recycled water services to function safely and sustainably.

The tourism and hospitality sector is a dominant economic driver within NapaSan's service area. Hotels, restaurants, tasting rooms, and visitor-serving businesses generate significant employment and economic activity, particularly in central Napa and along major transportation corridors. These uses are highly dependent on continuous wastewater service and are sensitive to service disruptions during flood, wildfire, heat, or seismic events.

Agriculture and wine production also play a critical role in the regional economy. While much vineyard land lies outside urban areas, many agricultural processing, storage, and support facilities are located within NapaSan's service area and rely on sewer service and recycled water. NapaSan's recycled water system supports agricultural irrigation and landscape uses, contributing to long-term water supply resilience and economic stability during drought conditions.

Additional economic activity includes healthcare services, light industrial and manufacturing uses, government and education, and retail and commercial services, particularly within the City of Napa. These sectors contribute to a stable employment base but vary in their vulnerability to hazard-related disruptions.

ACS and ESRI demographic data indicate that parts of NapaSan's service area include lower-income households, higher renter occupancy, and employment in service-oriented industries, particularly hospitality and agriculture. Workers in these sectors may experience greater economic vulnerability during disasters due to wage volatility, limited benefits, and reduced capacity to absorb prolonged disruptions. Economic impacts from wastewater service interruptions may therefore disproportionately affect both workers and small businesses in higher social vulnerability areas.

NapaSan is a foundational component of the local economy, providing essential infrastructure that supports business continuity, public health, environmental compliance, and long-term economic growth. Disruptions to wastewater treatment or collection could have cascading economic impacts, including business closures, regulatory violations, loss of tourism revenue, and delayed recovery following hazard events.

12.2.4 Growth Trends & Future Development

NapaSan's service area is largely built out, with future growth expected to occur primarily through infill development, redevelopment, and incremental intensification within the City of Napa, rather than large-scale greenfield expansion. Growth patterns within the service area are shaped by local land use policies, environmental constraints, infrastructure capacity, and regional housing needs, all of which influence wastewater service demand.

Future residential growth within the NapaSan service area is expected to be moderate and concentrated in existing urban areas, including downtown Napa, transit-accessible corridors, and designated infill opportunity sites. New housing development is anticipated to include a mix of multi-family housing, mixed-use projects, and accessory dwelling units (ADUs), reflecting state housing mandates and local planning priorities. These development patterns generally increase wastewater demand incrementally while placing greater emphasis on system reliability and peak wet-weather capacity rather than system expansion.

Economic development trends within the service area continue to emphasize tourism, hospitality, healthcare, and professional services, with limited expansion of heavy industrial uses. Redevelopment and reinvestment in existing commercial areas, particularly within central Napa, are expected to generate localized increases in wastewater flows and recycled water demand. Tourism-related growth may also contribute to seasonal fluctuations in wastewater generation, which must be accommodated during peak periods and hazard events.

Future development within the NapaSan service area is influenced by infrastructure capacity, floodplain considerations, water supply availability, and climate-related constraints. NapaSan's long-range planning emphasizes optimizing existing facilities, reducing inflow and infiltration, and improving operational flexibility to accommodate growth without increasing hazard exposure. Climate change considerations, including increased storm intensity, sea level rise, and extreme heat, are expected to play a growing role in shaping where and how development occurs.

12.3 Planning Process

NapaSan followed the planning process detailed in Volume 1, Section 2, including participating in the county-wide Hazard Mitigation Planning Team (HMPT) and formulating their own internal planning team to support the broader planning process.

The district's representatives in the Steering Group led stakeholder and public engagement efforts alongside the Consultant Team, with assistance from the county-wide HMPT and their internal planning team. This engagement process is described in Volume 1. Specifically, for the district, this included postings to the district website and social media, and outreach events, as documented in Appendix B. Examples of Key Stakeholders engaged by Napa County on behalf of the district with relevance to the development of NapaSan's mitigation strategy include the USDA and other federal agencies; CAL FIRE and other state agencies; other jurisdictions; community-based organizations such as local Chamber of Commerce chapters; utility providers like PG&E; UC Davis and other academia; and local businesses.

All Key Stakeholders that were invited to participate in the planning process are listed in Volume 1, Section 2, and the input received from stakeholders was integrated into the district's annex, as described in Volume 1 Table 2-9. The district's internal planning team participants, their positions, and how they participated in the planning process are shown in Table 12-1.

Table 12-1: NapaSan Planning Team and Steering Group Members

Team Members	Title	Description of Involvement
Matthew Lemmon	Engineering Director/District Engineer	Lead Point-of-Contact, HMPT #1, BO #1 and #2
Amy Walcker	Human Resources Manager	Alternate Point-of-Contact, HMPT #2, BO #1 and #2
Nick Hunter	Safety, Training and Fleet Maintenance Officer (STFMO)	Participating Stakeholder, HMPT #1, and #2, BO #1 and #2

NapaSan staff participated in a comprehensive hazard mitigation planning process as part of the 2026 Napa County MJHMP update. This included a series of breakout meetings, listed in Table 12-2 that engaged the district's planning team, which included key district personnel and stakeholders in evaluating hazards, identifying local vulnerabilities, and prioritizing mitigation strategies

The process began with a County-Wide Steering Group Kickoff Meeting on February 28, 2024. This initial meeting focused on welcoming participants, establishing a shared understanding of the project scope and schedule, clarifying roles and responsibilities of the Steering Group, the county-wide Hazard Mitigation Planning Team (HMPT), and individual jurisdictional planning teams, and included a review of key changes since the 2020 Local Hazard Mitigation Plan The meeting set the foundation for coordinated participation throughout the planning effort.

On December 10, 2025, participants engaged in a hexagon mapping activity designed to visually identify mitigation actions that could benefit from or require inter-jurisdictional coordination. These collaborative efforts helped shape a refined set of mitigation alternatives, establish shared planning goals, and align local strategies with FEMA's Hazard Mitigation Assistance (HMA) funding framework.

Throughout the series of breakout meetings, the district engaged in a structured and collaborative planning process focused on assessing hazard risks, identifying vulnerabilities, and developing targeted mitigation strategies. The meetings began with recaps of the county-wide HMPT meetings to ensure alignment of goals and progress.

During the August 21, 2024 breakout out meeting, discussions concentrated on community engagement outcomes, initial risk assessments, and the integration of demographic data to better understand vulnerable populations. Jurisdictional teams reviewed their specific hazard exposures using the Risk Assessment Mapping Platform (RAMP) and participated in prioritization exercises to identify their top hazards.

The June 9, 2025, breakout meeting shifted toward reviewing local capabilities and defining specific areas of concern, which informed the drafting of problem statements. Teams worked collaboratively to refine mitigation alternatives, align actions with FEMA guidelines, and develop a shortlist of priority mitigation actions and inter-jurisdictional collaboration opportunities.

The meetings also included consensus-building activities around hazard rankings, capabilities, and planned actions, while providing regular updates on the overall project schedule.

Table 12-2: NapaSan Planning Team Meetings

Meeting & Date	Agenda / Topics	Goals / Key Inputs
County-Wide Steering Group and HMPT Kick-off and Meetings #1 & #2 February 28, 2024– July 18, 2024		
NapaSan Planning Team Breakout Meeting #1 August 21, 2024	▪ County-wide HMPT meetings #1 and #2 recaps ▪ Community engagement progress and results ▪ Risk assessment and community vulnerability ▪ Demographics and vulnerable populations ▪ Overview of jurisdiction-specific hazard risks and exposure ▪ Introduction to Risk Assessment Mapping Platform (RAMP) ▪ Jurisdiction-specific hazard risk ranking exercise ▪ Project schedule updates and next steps	▪ Consensus on jurisdiction-specific priority hazards ▪ Identify capabilities and potential mitigation actions ▪ Community engagement volunteers
County-Wide HMPT Meeting #3 March 25, 2025		
NapaSan Planning Team Breakout Meeting #2 June 9, 2025	▪ Breakout Meeting #1 and HMPT #3 recaps ▪ Review capabilities assessment ▪ Review areas of concern and define problem statements ▪ Principles of effective mitigation strategies and actions, and mitigation alternatives ▪ Refine and align jurisdiction-specific mitigation actions exercise ▪ Project schedule updates and next steps	▪ Consensus on jurisdiction-specific capabilities ▪ Consensus on jurisdiction-specific areas of concern ▪ Consensus on priority mitigation actions and collaboration opportunities ▪ Community engagement volunteers
County-Wide HMPT Meeting #4 December 10, 2025		

12.3.1 Public Input & Draft Review

As detailed in Volume 1, Section 2, the draft plan was available for public review and comment from May 15 to June 2. Public comments received during that time were similar to those gathered throughout the public engagement process, including the need for more equity in the distribution of mitigation activities and funding and the need for enhanced cooperation among jurisdictions, utility providers, and state agencies. These comments were incorporated into the district's mitigation strategy, as appropriate; although, most were already addressed by the Mitigation Action Plan which was based on previous public input.

Public and stakeholder input was gathered and incorporated throughout the plan development process, before the public review period, such as from the online public survey (see Volume 1, Section 2.1.2 and

Appendix B, for details). During the review period, jurisdictional staff and stakeholders that participated in the plan development also reviewed the public draft and provided comments on minor corrections and revisions, which were addressed in the final plan.

12.4 What's New

This section provides an overview of hazard mitigation planning efforts for the planning area and highlights the updates made in the 2026 MJHMP. This is the first time NapaSan has participated in the MJHMP process. While not included in the 2020 plan, the district has since strengthened its focus on resilience through key efforts. Through this MJHMP process, NapaSan has identified its highest-priority hazards, developed hazard-specific problem statements, and proposed actionable mitigation strategies.

By aligning with countywide partners and leveraging regional resources, NapaSan has strengthened its capacity to prepare for, withstand, and recover from disasters while continuing to protect its unique coastal community character.

12.4.1 Mitigation Activities

Over the past decade, NapaSan has implemented a range of mitigation activities aimed at reducing vulnerability to flooding, seismic events, climate change impacts, and operational disruptions. These efforts have been integrated into capital improvement planning, asset management, recycled water expansion, and climate adaptation initiatives, supporting both infrastructure resilience and continuity of essential wastewater services.

NapaSan has made sustained investments in rehabilitating and replacing aging wastewater infrastructure, with a focus on reducing inflow and infiltration (I&I) and improving system performance during extreme rainfall events. Sewer main rehabilitation, condition-based replacement, and basin-specific upgrades have reduced the likelihood of system surcharging, sanitary sewer overflows, and treatment capacity exceedances during storms. These actions directly mitigate flood-related risks to public health and water quality.

At the wastewater treatment plant and associated facilities, NapaSan has upgraded critical mechanical, electrical, and control systems to improve operational reliability. Improvements include redundancy in key process components, modernization of treatment systems, and protection of sensitive equipment from flood exposure, supporting continued operations during hazard events.

Recognizing its location within the lower Napa River watershed and near tidal influences, NapaSan has taken steps to address flood and climate-related risks. These include evaluating vulnerabilities of oxidation ponds, levees, access roads, and low-lying facilities, as well as incorporating climate projections into long-range planning. NapaSan's Climate Change Adaptation Plan identified priority risks related to sea level rise, extreme precipitation, groundwater rise, and heat, and established a framework for phased adaptation actions over time.

Operational strategies, such as seasonal treatment and discharge adjustments, wet-weather flow management, and storage utilization, have also been refined to mitigate flood risk and maintain regulatory compliance during extreme events.

Expansion and optimization of NapaSan's recycled water program over the last decade has provided mitigation benefits related to drought resilience and water supply reliability. By increasing the beneficial reuse of treated wastewater for agricultural irrigation, landscaping, and industrial uses, NapaSan has reduced dependence on potable water supplies during drought conditions and supported regional water resilience. Recycled water infrastructure improvements also reduce discharge volumes during the dry season, improving operational flexibility.

Implementation and ongoing refinement of an asset management program has allowed NapaSan to prioritize mitigation investments based on risk, condition, and criticality. By systematically identifying high-risk assets and failure consequences, NapaSan has improved decision-making related to capital improvements and hazard mitigation, ensuring limited resources are directed toward projects with the greatest risk-reduction benefits.

12.4.2 Mitigation Successes

Recycled Water Upgrade Project

NapaSan owns and operates the Soscol Water Recycling Facility (SWRF), which includes a wastewater treatment plant that produces recycled water, a recycled water pump station, and two recycled water storage reservoirs. To improve system reliability and redundancy, NapaSan is proposing upgrades to the Soscol Recycled Water Pump Station, including replacement of the existing jockey pump, installation of additional pumps and a new pump bay, and related electrical and control improvements. These upgrades will enhance operational efficiency, extend equipment life, and increase the reliability of recycled water delivery, providing additional drought resilience for NapaSan's recycled water customers.

Linear Generator



Figure 12-10: NapaSan Linear Generator Install

NapaSan has installed a new linear generator at its wastewater treatment plant that is fueled by biogas produced onsite through anaerobic digestion. Developed by Mainspring Energy, the linear generator is a fuel-flexible power generation technology capable of converting clean fuels, including wastewater treatment biogas, into reliable electricity. The system is expected to generate approximately 230 kW of renewable electricity, making NapaSan the first wastewater treatment facility to operate a linear generator using digester-derived methane. This project supports NapaSan's Climate Change Mitigation Plan by reducing greenhouse gas emissions, improving energy efficiency, and increasing operational resilience through onsite renewable power generation.

Sewer Line Rehabilitation

The Summer 2022 Collection System Rehabilitation Project focused on repairing and replacing aging sewer pipes within the project area to reduce the entry of stormwater and groundwater into the sewer system. Napa Sanitation District crews conducted this work as part of the District's ongoing collection system rehabilitation and maintenance program. The project addressed defects in sewer mains and laterals that contribute to inflow and infiltration and capacity constraints, followed by restoration of affected pavement and right-of-way areas. These improvements support NapaSan's long-term strategy to enhance system performance, reduce the risk of failures during storm events, and protect public health and water quality.

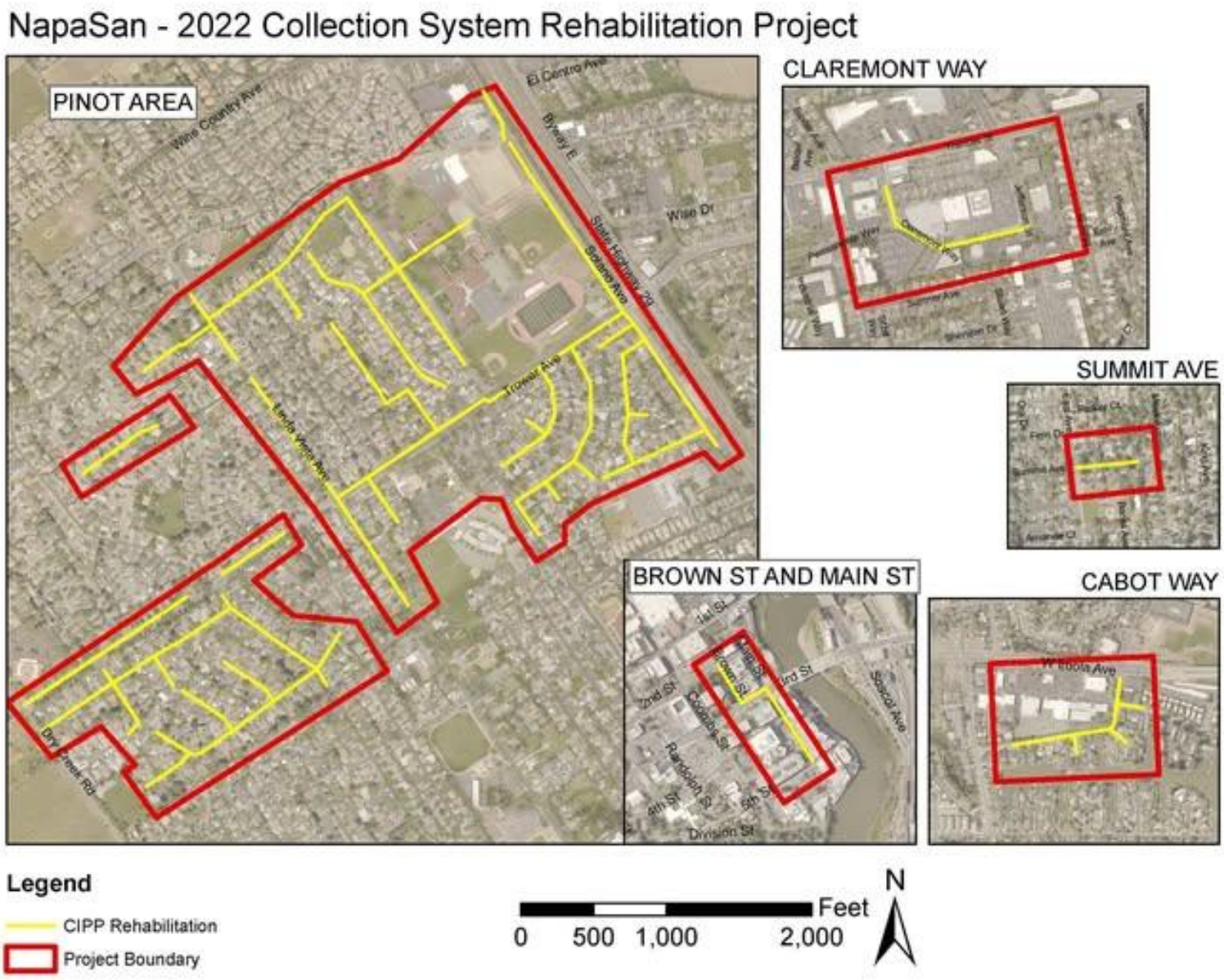


Figure 12-11: Collection System Rehabilitation Project

12.5 Risk Assessment

This section focuses on profiling hazards specific to NapaSan and assessing their vulnerability independent of the broader county-wide planning area, which has been evaluated in Section 3 of Volume 1. The hazard profiles in Volume 1 discuss overall impacts to the planning area and describe relevant plans, policies, and regulations; past events; location; frequency and probability of future occurrences; severity and extent; warning time; secondary hazards; and climate change impacts. For more information on risk assessment methodologies, see Volume 1, Appendix A.

This section includes a tailored vulnerability assessment, analyzing assets at risk such as population, property, and critical facilities and infrastructure unique to the district, and information on district-specific differences in hazard vulnerability across the planning area. It also identifies total district assets at risk,

including people, property, and critical facilities and infrastructure within the district. In addition, this section presents growth and development trends for the community, offering insights into vulnerabilities and risks that represent the broader context of assets at risk.

12.5.1 Hazard Screening & Prioritization

Members of the Planning Team from each participating jurisdiction came together to collaboratively decide which county-wide hazards would be included in the MJHMP, and which would be excluded. Hazard screening and prioritization took place early in the process and integrated historic data, local knowledge, and consensus opinions to create a risk assessment matrix for the county as well as for each participating jurisdiction. These matrices indicate the priority of hazards prior to further refinement. Details about this process, the results of the discussion, and in-depth profiles for county-wide hazards can be found in Volume 1, Sections 2 and 3.

NapaSan's internal planning group used the same hazard identification and prioritization process as the county-wide Planning Team. They reviewed previously prepared hazard mitigation plans and other relevant documents to determine the realm of natural hazards that have the potential to affect the district. Table 12-3 provides a crosswalk of hazards identified in select planning documents, including the 2020 Napa County MJHMP, 2019 NapaSan Strategic Plan, 2022 Climate Change Adaptation Plan and the 2023 State of California HMP. The crosswalk was used to develop a preliminary hazards list, providing a framework for the group to evaluate which hazards were truly relevant to NapaSan and which ones were not.

The internal planning group then ranked hazards based on their probability of affecting NapaSan and potential impacts on the community. Figure 12-12 displays the results of the hazard risk ranking exercise that was performed before further refinement. All hazards have been profiled in Volume 1 of this document. The purpose of this annex is to specifically address the district's vulnerability to specifically identified hazards.

Table 12-3: NapaSan Document Review of Potential Hazards

Hazard	2020 Napa County MJHMP	2022 NapaSan Climate Change Adaptation Plan	2023 California SHMP
Agricultural Pests	■		■
Avalanche			■
Climate Change	■		■
Coastal			■
Dam Failure	■		■
Drought	■	■	■
Earthquake / Liquefaction	■		■
Extreme Cold			■
Extreme Heat		■	■
Extreme Weather / Storms	■		■
Flood	■		■
Geologic / Mass Movement	■		■
Human-Caused			■
Insects			■
Levee Failure			■
Pandemic Disease	■		■
Sea Level Rise		■	■
Soil			■
Subsidence			■
Tornado			■
Tsunami / Seiche Wave			■
Volcano			■
Wildfire	■	■	■

Risk Assessment Matrix Definitions

PROBABILITY RATING

The likelihood of a hazard event occurring within a time period?

PROBABILITY

- **Highly Likely** - **Highly likely** - 100% annual probability. Or Likely to occur every year in your lifetime.
- **Likely** - **Likely** - between 10 & 100% annual probability. Or will occur several times in your lifetime.
- **Possible** - **Possible** - between 1 & 10% annual probability. Or Likely to occur some time in your lifetime.
- **Unlikely** - **Unlikely** - less than 1% annual probability. Or unlikely but possible to occur in your lifetime.

IMPACT RATING

In terms of injuries, damage, or death, would you anticipate impacts to be minor, limited, critical, or catastrophic when a significant hazard event occurs? The impact could be in terms of one hazard event (flooding from a culvert failure) or a large-scale event (multiple rivers flooding) in the same jurisdictional boundary.

IMPACT

Minor	Limited	Critical	Catastrophic

Minor - very few injuries, if any. Only minor property damage & minimal disruption on quality of life. Temporary shutdown of critical facilities.

Limited - minor injuries only. Approx. 10% or less of property in disaster footprint damaged or destroyed. Complete shutdown of critical facilities for more than one day.

Critical - multiple deaths/injuries possible. Between 25% and 50% of property in disaster footprint is damaged or destroyed. Complete shutdown of critical facilities for more than one week.

Catastrophic - high number of deaths/injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for 30 days or more.

To concentrate resources, the jurisdictional planning team will focus on "High" and "Extreme" risk hazards, and "Medium" risk hazards to a lesser extent. These hazards have the higher probability and greater impact as it relates to the jurisdictions planning area.

Hazard definitions are included in **Vol. 1** of this plan. Some hazards are discussed as subset hazards— e.g., "Levee Failure" within the "Flood" hazard profile. If a hazard is not present on the risk matrix, is grey, or categorized as a "Low" risk hazard, the jurisdictional planning team felt the hazard had a minimal footprint or impact within their planning area and chose not to profile the hazard.

Hazard Information / Legend:



Climate Change impacts will be addressed within each relevant hazard section within the plan update and as a stand alone section for each jurisdiction. Climate change may change the frequency, duration, or intensity of other hazards profiled.

Napa Sanitation District Risk Matrix

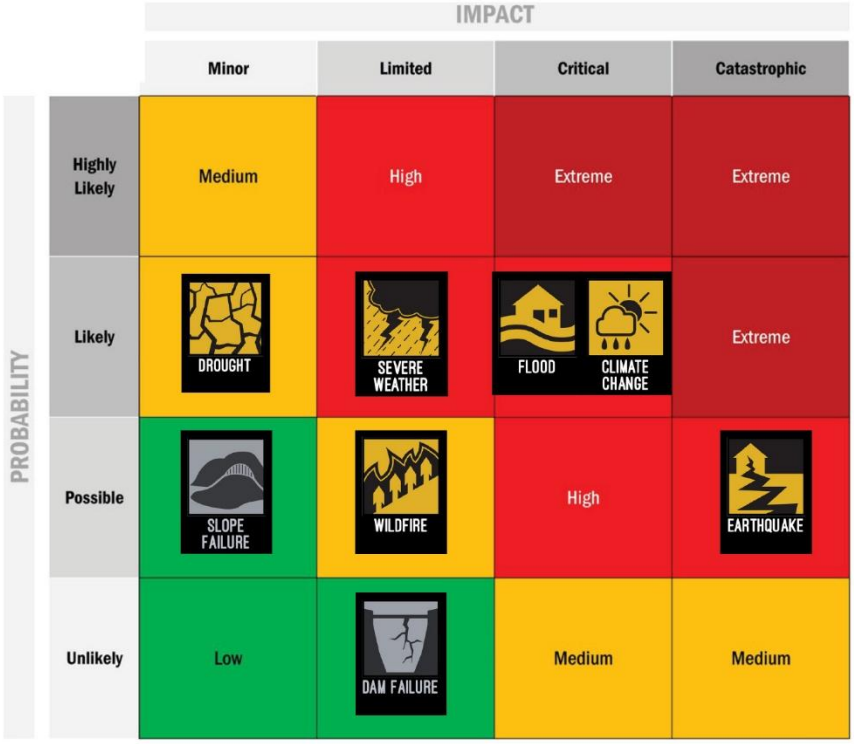


Figure 12-12: NapaSan Risk Assessment Matrix

Note: Hazard naming in the Risk Assessment Matrix may not match the final naming used. Refer to hazards prioritization summary table.

Priority Hazards

The results of the initial risk ranking exercise completed by the district's Planning Team, before further refinement, are identified in the county's completed matrix in Figure 12-12. Table 12-4 provides the final list of priority hazards and subhazards with additional details about why certain hazards were chosen and why others were not prioritized. However, it should be noted that many hazards not prioritized for profiling are briefly discussed as secondary or compounding hazards, and subhazards that were profiled and included in the risk assessment are listed specifically.

Table 12-4: NapaSan Hazards Prioritization Summary

Hazard	Priority	Explanation
Earthquake / Liquefaction	**High**	**Profiled in Volume 1, Section 3.3.4, and Section 12.5.2.2 in this annex, including Liquefaction**
Wildfire	**Medium**	**Profiled in Volume 1, Section 3.3.1, and Section 12.5.2.1 in this annex**
Flood	**High**	**Profiled in Volume 1, Section 3.3.2, and Section 12.5.2.3 in this annex**
Levee Failure	-	Profiled in Volume 1, Section 3.3.2; not a priority due to low probability and impact potential
Extreme Weather / Storms	**Medium**	**Profiled in Volume 1, Section 3.3.5, and Section 12.5.2.5 in this annex as Severe Weather, including High Wind and Heavy Rain** (Winter Weather not a priority due to low probability and impact potential)
Drought	**Medium**	**Profiled in Volume 1, Section 3.3.6, and Section 12.5.2.4 in this annex**
Geologic / Mass Movement	-	Profiled in Volume 1, Section 3.3.5; not a priority due to low probability and impact potential
Extreme Heat	-	Profiled in Volume 1, Section 3.3.8; not a priority due to being outside jurisdictional mission and authority
Agricultural Pests	-	Profiled in Volume 1, Section 3.3.9; not a priority due to being outside jurisdictional mission and authority
Sea Level Rise	**High**	**Profiled in Volume 1, Section 3.3.9, and Section 12.5.2.6 in this annex under Climate Change**
Climate Change	**High**	**Profiled in Volume 1, Section 3.3.9, and Section 12.5.2.6 in this annex, including Sea Level Rise** and discussed as a compounding hazard in relevant profiles
Dam Failure	-	Profiled in Volume 1, Section 3.3.3; not a priority due to low probability and impact potential

12.5.2 Vulnerability to Specific Hazards

Assessing vulnerabilities exposes the unique characteristics of individual hazards and begins the process of narrowing down which areas within the district are vulnerable to specific hazard events. The vulnerability assessment considered unique local knowledge of hazards and impacts and a GIS overlaying method for examining such vulnerabilities in more depth. Using these methods, the district's planning group estimated vulnerable populations, properties, and assets, and potential losses. In addition, the exposure of district assets to drought, earthquake, wildfire, flood, and climate change hazards were also considered.

Many of the hazard profiles include a snapshot map and damage estimation tables that illustrate the district's vulnerabilities to those specific hazards. These maps assisted the planning group in understanding the hazard exposure of populations, parcels, and critical facilities and infrastructure. Each snapshot map contains an exposure summary that displays the percentage of the population, the improvement and content value of parcels, and the amount of critical infrastructure that is exposed. For hazards without geospatial extents, such as drought and severe weather, narratives are provided instead of exposure maps and tables.

Based on the hazard prioritization exercise, this vulnerability assessment focuses on seven hazards for the Napa Sanitation District, some of which encompass subhazards such as Liquefaction and Heavy Rain.

Wildfire
SECTION 12.5.2.1



Earthquake
SECTION 12.5.2.2



Flood
SECTION 12.5.2.3



Drought
SECTION 12.5.2.4



Severe Weather
SECTION 12.5.2.5



Climate Change
SECTION 12.5.2.6



12.5.2.1 Wildfire Hazard

Wildfire poses a primarily indirect but regionally significant hazard to the NapaSan due to the district's proximity to wildland–urban interface areas and its reliance on continuous power, facility access, and staff availability during major wildfire events. While NapaSan's core facilities are located within the urbanized area of the City of Napa, surrounding hillsides and open space areas are mapped as moderate to very high wildfire risk, creating the potential for cascading operational impacts even where direct facility exposure is limited.

The wildfire risk exposure map, Figure 12-13, shows that risk exposure within the NapaSan service area is relatively low. Mapping indicates that approximately 108 residents are located within wildfire hazard areas, representing a negligible portion of the district's total service population. About 426 parcels, or roughly 1 percent of parcels within the service area, intersect wildfire hazard zones. The total assessed value of parcels within wildfire hazard areas includes approximately $437 million in improvement value (about 2 percent of total improvement value) and $245 million in content value (about 1 percent of total content value). No essential facilities, hazardous materials sites, or high-potential-loss facilities operated by NapaSan are located within mapped wildfire hazard areas. However, seven transportation and lifeline segments, representing approximately 2 percent of mapped lifeline infrastructure, intersect wildfire hazard zones, indicating potential vulnerability related to access and utility corridors.

Although direct wildfire exposure to NapaSan infrastructure is limited, wildfire events can still significantly affect district operations through indirect impacts. These include power outages and Public Safety Power Shutoffs, restricted access to facilities due to evacuation orders or road closures, reduced staff availability during regional emergencies, and degraded air quality that may affect worker safety and outdoor operations. Wildfire impacts may also coincide with extreme heat events, increasing energy demand and compounding operational stress.

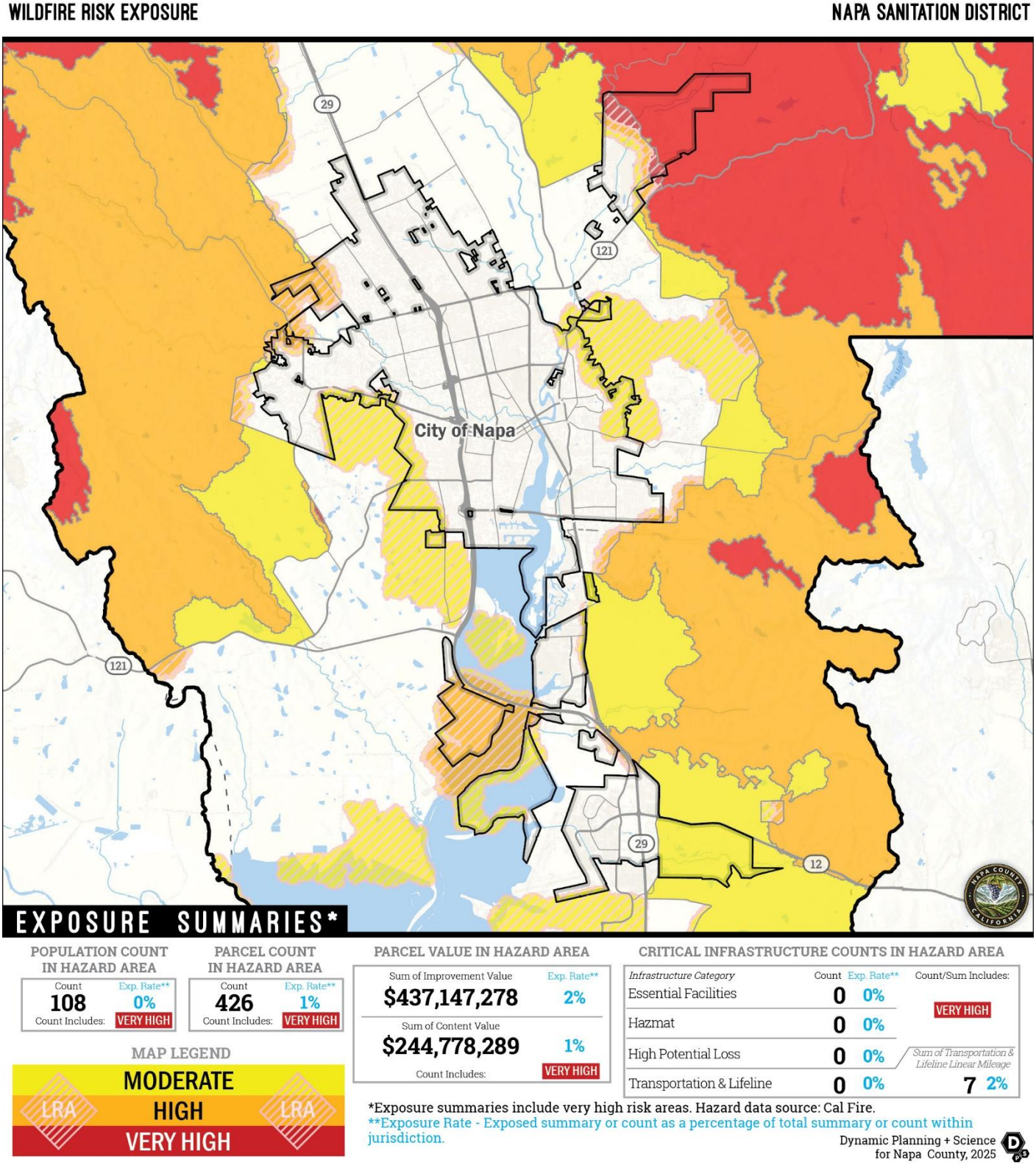


Figure 12-13: Exposure Summary – NapaSan Wildfire Risk

12.5.2.2 Earthquake Hazard

Earthquake hazard represents one of the most significant risks to NapaSan due to the district's location within an active seismotectonic setting influenced by nearby faults, including the West Napa Fault and the Hunting Creek–Berryessa fault system. As shown in Figure 12-14, scenario modeling indicates that strong to very strong ground shaking would occur across nearly the entire NapaSan service area during a major earthquake. Under the Hunting Creek–Berryessa M7.1 scenario, approximately 72 percent of the population and 75 percent of parcels within the district are exposed to strong to severe shaking (Modified Mercalli Intensity VII–VIII). In this scenario, more than $12.9 billion in improved parcel value and approximately $10.2 billion in content value fall within areas of damaging ground motion, reflecting widespread potential for structural damage, service disruption, and economic loss. Critical lifeline infrastructure is particularly vulnerable, with roughly 60 percent of transportation and lifeline assets exposed to strong or very strong shaking, increasing the risk of system outages and delayed emergency response.

The West Napa M6.7 earthquake scenario shown in Figure 12-15, presents even greater exposure due to its proximity to the urban core and NapaSan facilities. Nearly the entire district, approximately 100 percent of the population and 99 percent of parcels, is projected to experience strong to severe shaking (MMI VII–VIII). In this scenario, an estimated $20.1 billion in improved parcel value and $17.2 billion in content value are located within high-intensity shaking zones, underscoring the potential for widespread damage to buildings, pipelines, pump stations, and treatment facilities. All transportation and lifeline infrastructure within the district is exposed under this scenario, highlighting the risk of extensive service interruptions, limited access for repairs, and cascading impacts to public health and safety. These earthquake scenarios emphasize the importance of NapaSan's continued focus on seismic resilience, system redundancy, and emergency preparedness to maintain wastewater and recycled water services following a major seismic event.

Liquefaction

Liquefaction poses a significant secondary earthquake hazard for NapaSan due to the district's location along the Napa River corridor and within areas characterized by young alluvial soils, shallow groundwater, and historic floodplain deposits (Figure 12-16). Much of NapaSan's collection system, pump stations, and portions of its treatment and recycled water infrastructure are located in low-lying valley areas where liquefaction susceptibility is moderate to high. During strong ground shaking, these soil conditions can lose strength and stiffness, increasing the risk of ground settlement, lateral spreading toward the Napa River, and differential movement that can damage buried pipelines, manholes, and structural foundations. While liquefaction is a consideration in hazard mitigation planning, it is not profiled as a standalone hazard but addressed as a secondary earthquake effect.

In a major earthquake scenario, liquefaction-related ground failure could result in cracked or misaligned sewer mains, damaged force mains, and compromised pump station structures, leading to wastewater overflows, service interruptions, and extended repair timelines. Facilities located near waterways are particularly vulnerable to lateral spreading, which can exert significant forces on pipelines and appurtenant

structures. Even where surface structures remain intact, subsurface damage to gravity sewers and pressurized lines may be widespread and difficult to detect immediately, increasing the potential for post-event environmental impacts and public health concerns.

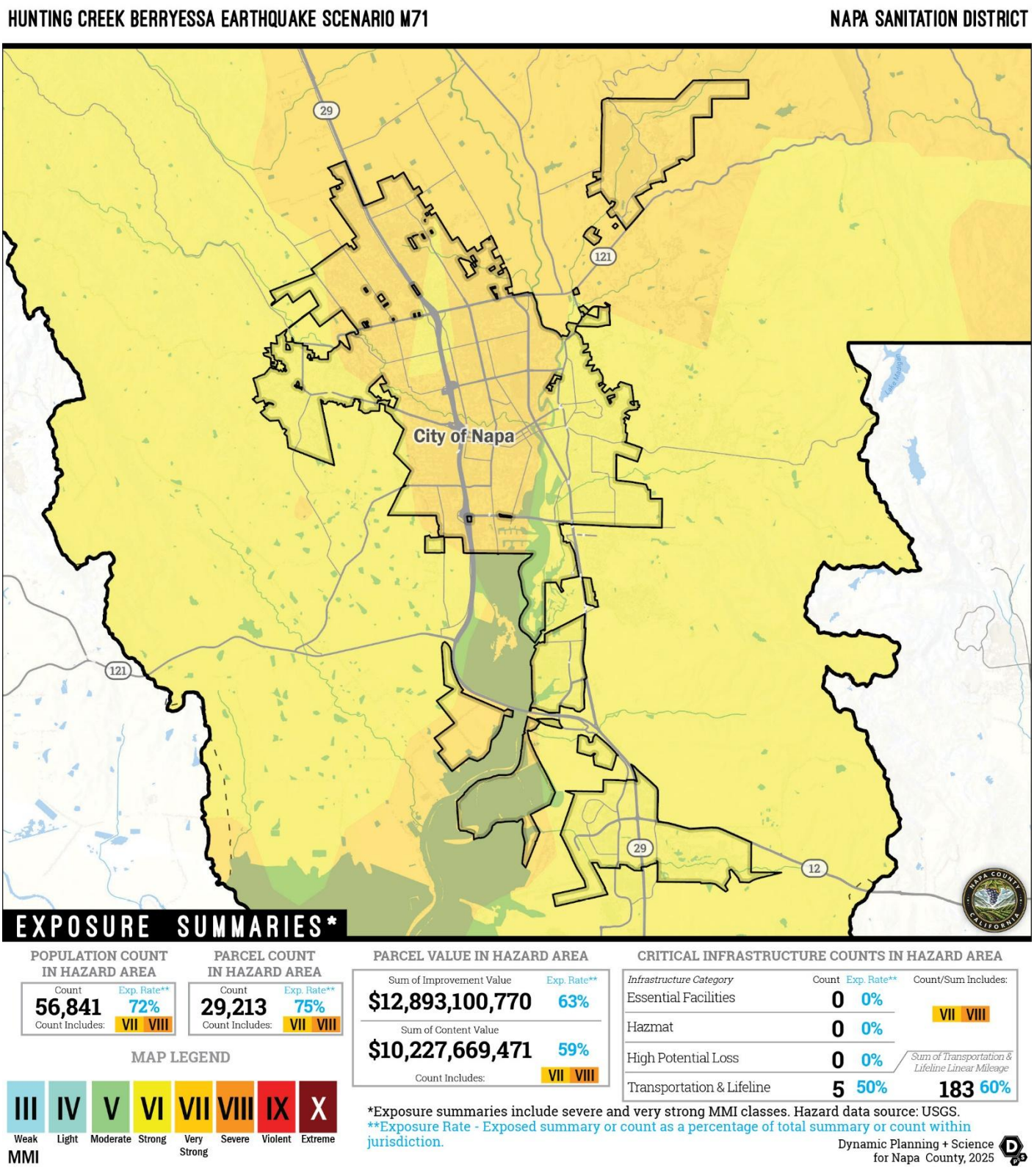


Figure 12-14: Exposure Summary – NapaSan Earthquake Risk (M7.1 Hunting Creek–Berryessa)

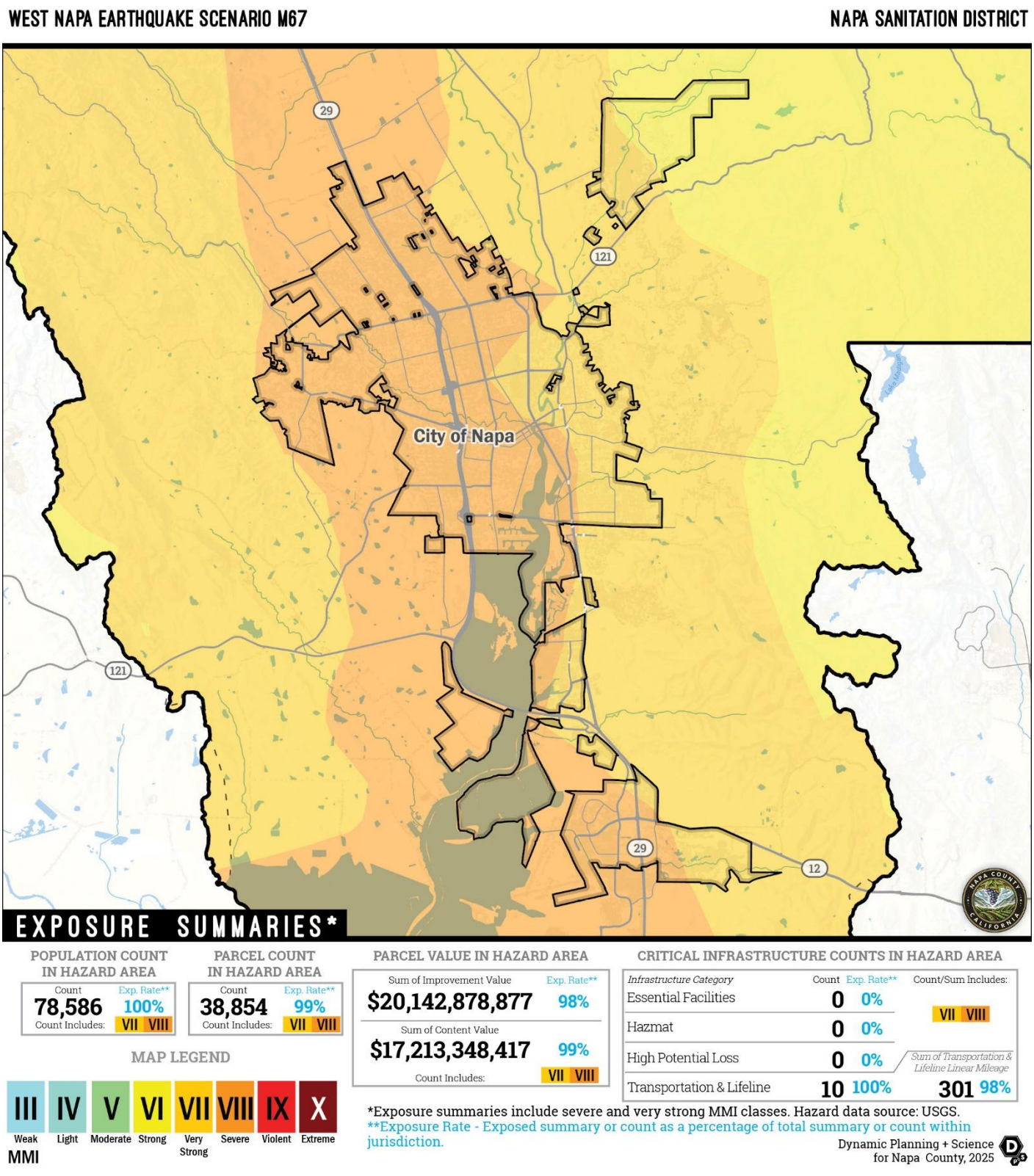


Figure 12-15: Exposure Summary – NapaSan Earthquake Risk (M6.7 West Napa)

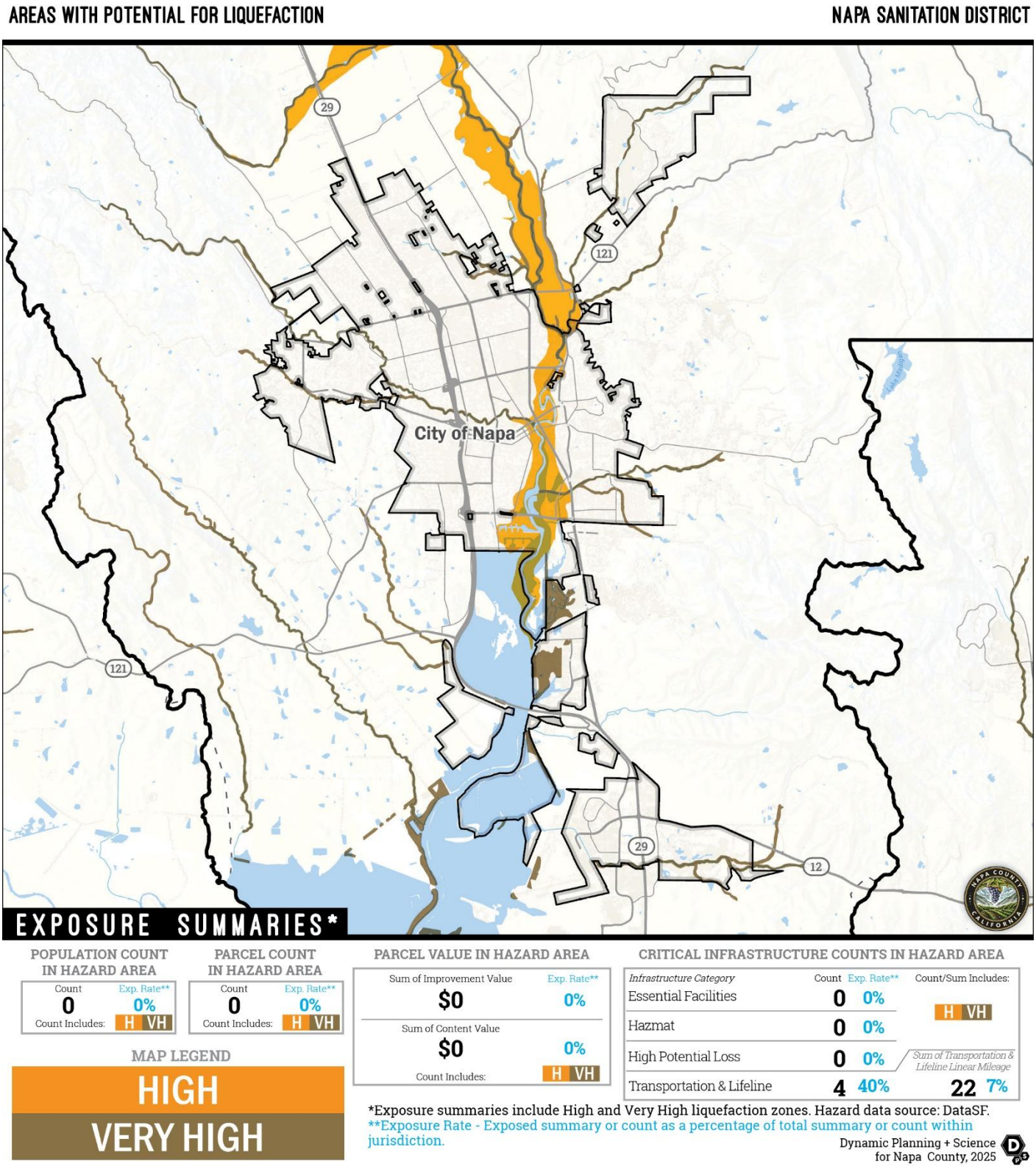


Figure 12-16: Exposure Summary – NapaSan Liquefaction Risk

12.5.2.3 Flood Hazard

Flooding represents a significant and well-documented hazard for NapaSan due to the district's alignment with the Napa River and its extensive low-lying floodplain areas. FEMA flood hazard mapping indicates that substantial portions of NapaSan's service area fall within the 100-year and 500-year flood zones, particularly along the Napa River corridor extending through the City of Napa and south toward San Pablo Bay. These flood-prone areas overlap with critical portions of the district's wastewater collection system, pump stations, and treatment infrastructure, increasing exposure to inundation during major storm events and prolonged periods of high river flow.

Based on the exposure analysis and shown in Figure 12-18, approximately 11,600 residents, or about 15 percent of the population within the district, are located in FEMA-mapped flood hazard areas. More than 4,500 parcels, representing roughly 12 percent of total parcels, fall within the 100-year and 500-year floodplains. The potential economic exposure is substantial, with an estimated $1.66 billion in improved property value and approximately $1.31 billion in content value located within flood hazard areas. These figures underscore the potential for widespread property damage, service disruption, and costly recovery efforts following major flood events.

Flood risk is especially concentrated in areas adjacent to the Napa River, where floodways and levee-protected zones coincide with critical infrastructure. While levees provide a degree of protection, residual risk remains from overtopping, structural failure, or events exceeding design capacity. Transportation and lifeline infrastructure is notably exposed, with approximately 40 percent of critical lifeline assets and 17 percent of total transportation and lifeline mileage located within flood hazard areas. Flooding of these assets can restrict access to facilities, disrupt wastewater conveyance, and complicate emergency response and recovery operations.

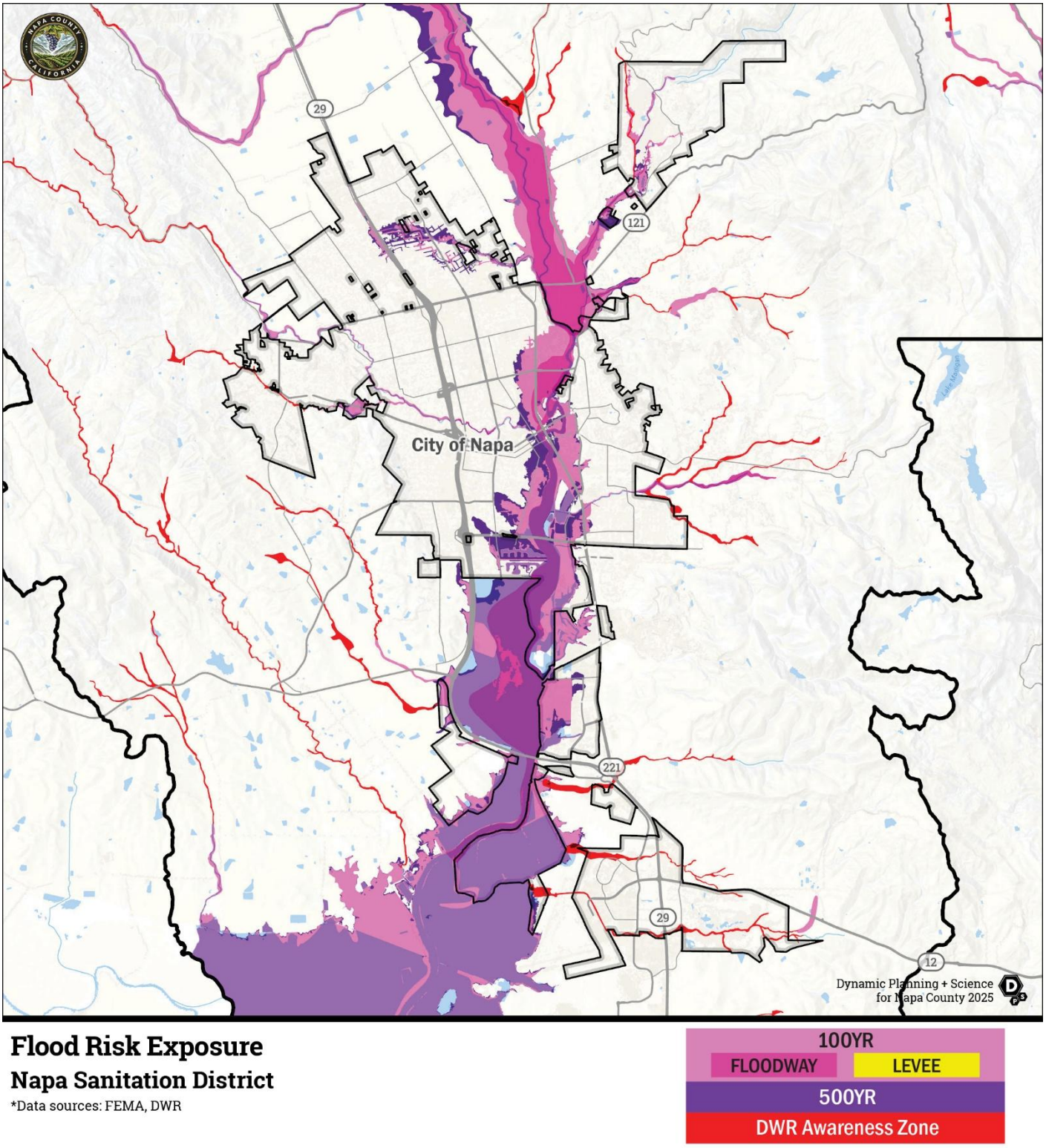


Figure 12-17: NapaSan Flood Risk (FEMA and DWR Awareness Zones)

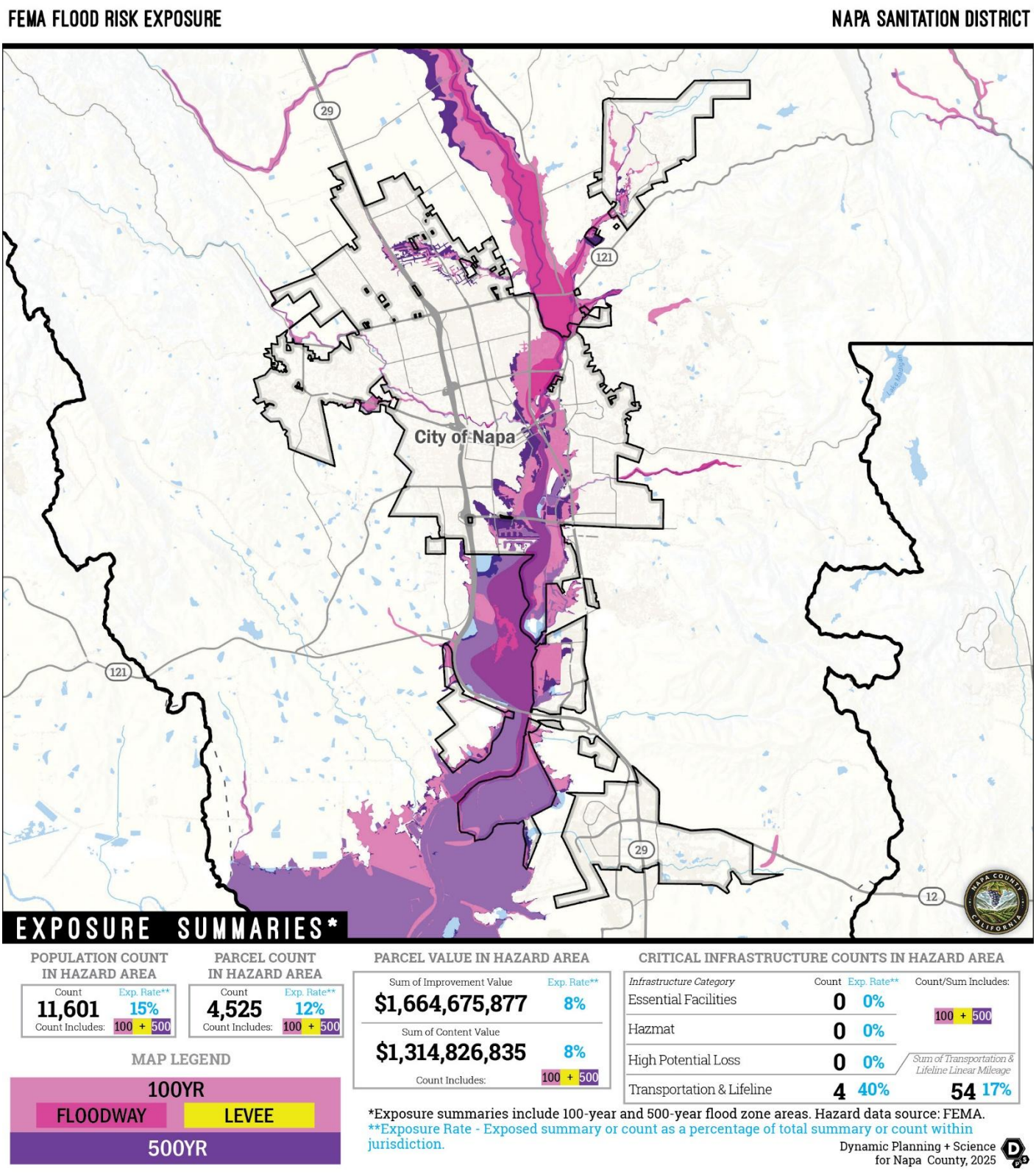


Figure 12-18: Exposure Summary – NapaSan Flood Risk (FEMA Zones)

12.5.2.4 Drought Hazard

The National Drought Monitor provides drought data and maps nationally and on a localized, watershed scale. The National Drought Monitor is the product of 11 agencies, including the NDMC, NOAA and USDA, and is available at http://droughtmonitor.unl.edu/. The National Drought Monitor categorizes the level of drought from D0 through D4, with D4 being the highest "exceptional drought." Table 12-5 depicts drought classifications and impacts from the level of drought occurrence in California, while Figure 12-19 shows a time series of the level of drought in Napa County from 2000 to 2026 according to the National Drought Monitor.

Drought is a persistent and escalating hazard for NapaSan due to the district's reliance on regional water supplies, increasing climate variability, and growing demand for reliable wastewater and recycled water services. Napa County has experienced multiple prolonged droughts over the past decade, resulting in reduced surface water availability, stressed groundwater resources, and heightened competition among municipal, agricultural, and environmental water uses. While drought does not directly damage infrastructure in the same way as floods or earthquakes, it poses significant operational and financial risks to NapaSan by altering influent flows, reducing recycled water demand in some sectors, and increasing the importance of reliable alternative water supplies.

Extended drought conditions can reduce wastewater influent volumes as water conservation measures take effect, potentially affecting treatment efficiency and revenue stability. At the same time, drought increases the strategic importance of NapaSan's recycled water system, which provides a locally controlled, drought-resilient supply for irrigation and non-potable uses. Facilities such as the Soscol Water Recycling Facility and associated pump stations and reservoirs play a critical role in offsetting potable water demand during dry periods. Ensuring the reliability and redundancy of this infrastructure is essential during drought conditions, when recycled water demand may increase even as overall wastewater flows decline.

Drought also creates indirect risks that intersect with other hazards. Reduced soil moisture and vegetation stress can contribute to land subsidence in localized areas, increase wildfire risk near facilities and conveyance corridors, and heighten the consequences of power outages during heat events. Operationally, drought-driven heat waves can place additional strain on mechanical and electrical systems, increase energy demands, and challenge workforce safety during outdoor maintenance activities.

Table 12-5: Drought Classifications and Impacts

Category	Description	Possible Impacts
D0	Abnormally Dry	▪ Soil is dry; irrigation delivery begins early ▪ Dryland crop germination is stunted ▪ Active fire season begins
D1	Moderate Drought	▪ Dryland pasture growth is stunted; producers give supplemental feed to cattle ▪ Landscaping and gardens need irrigation earlier; wildlife patterns begin to change ▪ Stock ponds and creeks are lower than usual
D2	Severe Drought	▪ Producers increase water efficiency methods and drought-resistant crops ▪ Grazing land inadequate ▪ Fire season is longer, with high burn intensity, dry fuels, and large fire spatial extent, more fire crews on staff ▪ Lake- and river-based tourism declines; boat ramps close ▪ Trees are stressed; plants increase reproductive mechanisms; wildlife diseases increase ▪ Water temperatures increase; programs to divert water to protect fish begin ▪ River flows decrease; reservoir levels are low and banks are exposed
D3	Extreme Drought	▪ Federal water is not adequate to meet irrigation contracts; extracting supplemental groundwater is expensive ▪ Fire season lasts year-round; fires occur in typically wet parts of the state; burn bans are implemented ▪ Ski and rafting business are low; mountain communities suffer ▪ Low water levels impede fish migration and cause lower survival rates ▪ Wildlife encroaches on developed areas; little native food and water is available for bears, which hibernate less ▪ Water sanitation is a concern; reservoir levels drop significantly; surface water is nearly dry; flows are very low; water theft occurs ▪ Livestock need supplemental feed, cattle and horses are sold; little pasture remains ▪ Well and aquifer levels decrease; homeowners drill new wells
D4	Exceptional Drought	▪ Fire season is very costly; number of fires and areas burned are extensive ▪ Many recreational activities are affected ▪ Fields are left fallow; orchards are removed; vegetable yields are low; honey harvest is small; agricultural unemployment is high, food aid is needed ▪ Fish rescue and relocation begin; pine beetle infestation occurs; forest mortality is high; wetlands dry up; wildlife death is widespread; algae blooms appear ▪ Poor air quality affects health: greenhouse gas emissions increase as hydropower production decreases; West Nile outbreaks rise ▪ Water shortages are widespread; surface water is depleted; federal irrigation water deliveries are curtailed; water prices are extremely high; wells are dry, more and deeper wells are drilled; water quality is poor

Source: Adapted from U.S. Drought Monitor Drought Classifications and Impacts

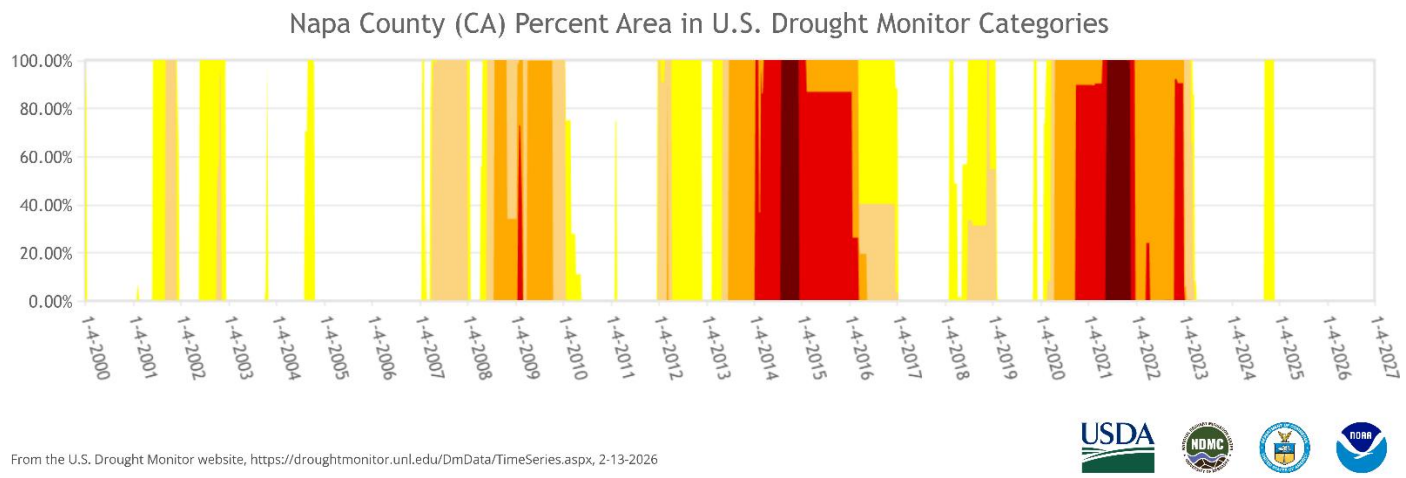


Figure 12-19: Drought Severity Timeline 2000-2026

12.5.2.5 Severe Weather Hazard

Although the City of Napa area benefits from a Mediterranean climate with some moderating marine influence from San Pablo Bay, the NapaSan remains vulnerable to a range of severe weather hazards, including high wind events and heavy rainfall. The most common problems associated with severe storms are loss of power, loss of access and, for a wastewater utility like NapaSan, inflow and infiltration (I&I) of stormwater into the collection system.

High Wind

High wind events can affect NapaSan by causing power outages or downing trees that block access for repairs or maintenance. Damage to overhead utilities and nearby electrical infrastructure can lead to power outages, potentially affecting critical collection and treatment systems, including communications and notification equipment.

Heavy Rain

Severe winter storm events can produce heavy rainfall, localized flooding, and hazardous site conditions. These events are often associated with atmospheric river systems that bring prolonged and intense precipitation to the Napa Valley, increasing the potential for drainage system exceedance and localized inundation.

Heavy rainfall can result in saturated soils across NapaSan's service area, particularly in lower-lying portions near the Napa River. These conditions may lead to ponding in intersections, blocked access roads, reduced effectiveness of stormwater infrastructure, and cause localized erosion or sediment transport. However, such flooding or inflow and infiltration (I&I) of stormwater into the wastewater system can overwhelm NapaSan's infrastructure and facilities, potentially causing sanitary sewer overflows. These releases can cause environmental pollution and public health emergencies.

NapaSan has completed several I&I projects over the past decade. Projects have consisted of rehabilitating sewer mains, manholes, and laterals and have achieved varied success. With the driver for the program to reduce peak wet weather flows in lieu of implementing large conveyance projects. Combined with climate change-driven sea level rise and tidal influences, I&I will only worsen over time if additional wastewater infrastructure in vulnerable basins are not hardened to resist stormwater intrusion.

12.5.2.6 Climate Change Hazard

Average annual temperatures across most of California have already increased by more than 1°F, with some areas experiencing rises of over 2°F when comparing the 1901–1960 average to that of 1986–2016. Daily maximum temperatures, a key indicator of extreme heat, are projected to increase by 4.4°F to 5.8°F by 2050 and by 5.6°F to 8.8°F by 2100. Heat waves that impact public health, known as heat-health events, are also expected to intensify across the state. By 2050, these events are projected to last up to two weeks longer in the Central Valley and occur four to ten times more often in the Northern Sierra region (California Natural Resources Agency, 2022).

California is already experiencing significant impacts from climate change, including prolonged drought, a lengthened wildfire season, increased coastal flooding and erosion, and widespread tree mortality. The state has observed rising average temperatures, more extreme heat days, fewer cold nights, a longer growing season, and shifts in the water cycle, with less winter precipitation falling as snow. In addition, summertime fog has declined by approximately 33%, and both snowmelt and rainwater runoff are occurring earlier in the year (Cal OES, 2018).

Long-term trends indicate a 12% to 20% decline in fog across California from 1900 through projections to 2070. Climate experts suggest that warming temperatures reduce the ability of air masses to cool enough to produce fog, which plays a critical role in supporting California's ecosystems (Grantham, Teodore; University of California, Berkeley, 2018).

Climate change is a cross-cutting hazard for NapaSan that is expected to intensify the frequency, severity, and complexity of many existing natural hazards affecting the district's infrastructure, operations, and service population. Regional climate projections for Napa County indicate increasing temperatures, more extreme precipitation variability, longer and more intense droughts, and a higher likelihood of extreme weather events. These changes have direct implications for wastewater treatment, recycled water production, energy use, and the long-term resilience of NapaSan's facilities located along the Napa River and within low-lying valley areas.

Rising temperatures and more frequent heat waves can stress mechanical and electrical systems, increase energy demand for treatment processes, and pose occupational health risks for staff performing outdoor or confined-space work. Warmer conditions may also affect wastewater characteristics, including biological treatment performance and odor control, requiring adaptive operational strategies. At the same time, climate-driven drought conditions increase the strategic importance of NapaSan's recycled water system as a reliable, locally controlled water supply, while also creating revenue and operational challenges associated with reduced influent flows during extended conservation periods.

Climate change is also expected to amplify flood risk through more intense atmospheric river storms and altered runoff patterns. Even where flood control infrastructure and levees are in place, larger and more frequent storm events increase the likelihood of overtopping, infrastructure inundation, and access constraints during emergencies. These flood risks are compounded by sea level rise and higher tidal influences in downstream areas, which can reduce drainage efficiency and increase backwater effects along the Napa River corridor. For NapaSan, these conditions elevate the risk of service disruption, equipment damage, and environmental impacts if facilities are compromised during extreme events.

In addition, climate change contributes to increased wildfire risk and associated secondary impacts, including power outages, smoke exposure, and debris flows following burn scars. While much of NapaSan's core infrastructure lies outside the highest wildfire hazard severity zones, utility shutoffs and regional emergency conditions can disrupt operations and staffing. Climate-driven seismic secondary hazards, such as liquefaction potential influenced by groundwater conditions, further underscore the interconnected nature of climate impacts on the district's systems.

Sea Level Rise

Sea level rise presents a growing long-term hazard for NapaSan due to the district's downstream location along the Napa River and its hydraulic connection to San Pablo Bay. While much of NapaSan's service area lies inland, low-lying southern portions of the district, particularly areas adjacent to tidal reaches of the Napa River and wetlands, are vulnerable to rising sea levels, higher tidal elevations, and increased backwater effects. These conditions can reduce the effectiveness of gravity drainage, increase baseline water levels in the river system, and exacerbate flooding during storm events.

Exposure analysis as shown in Figure 12-20 indicates that current sea level rise scenarios result in relatively limited direct impacts within the district when compared to other hazards, but the risks are spatially concentrated and operationally important. Approximately 1,270 residents, or about 2 percent of the population, are located within areas exposed to projected sea level rise ranging from low to intermediate-high scenarios. Fewer than 40 parcels fall within these exposure areas, with relatively low associated improvement and content values compared to flood or earthquake hazards. However, several transportation and lifeline segments—approximately 3 percent of system mileage—are located within areas influenced by sea level rise, highlighting potential access and operational challenges rather than widespread structural loss.

The primary concern for NapaSan is not immediate inundation of large service areas, but the compounding effects of sea level rise on flood risk, groundwater levels, and system performance over time. Rising sea levels can increase groundwater elevations and reduce hydraulic gradients, placing additional stress on buried sewer infrastructure, increasing the potential for infiltration and inflow, and reducing conveyance efficiency during wet-weather events. Sea level rise also heightens the risk of prolonged flooding in downstream areas during extreme tides combined with storm-driven river flows.

SEA LEVEL RISE EXPOSURE

NAPA SANITATION DISTRICT

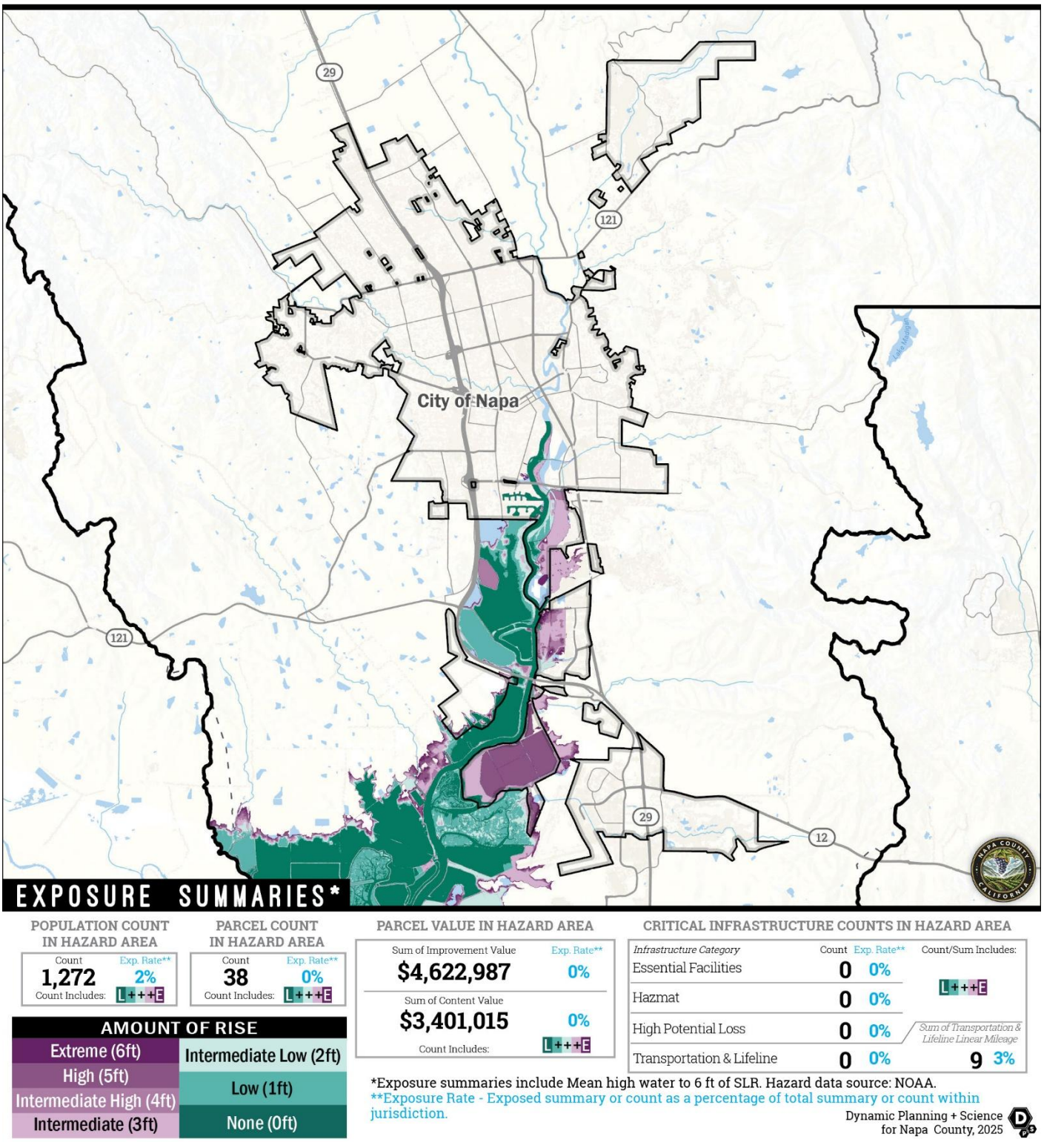


Figure 12-20: Exposure Summary – NapaSan Sea Level Rise

12.5.3 Climate Change Impacts & Vulnerable Populations

Climate change disproportionately affects vulnerable populations within NapaSan's service area by amplifying existing social, economic, and health inequities. Rising temperatures, more frequent heat waves, intensified flooding, prolonged droughts, and degraded air quality place greater strain on residents who have fewer resources to prepare for, respond to, and recover from hazard events. Communities located in low-lying areas near the Napa River, where flood risk and sea level rise impacts are concentrated, are more likely to experience repeated disruptions that affect housing stability, access to services, and public health.

Social Vulnerability Index patterns within the district indicate that higher vulnerability is clustered in parts of central and southern Napa, where higher proportions of low-income households, renters, elderly residents, and individuals with disabilities are present. These populations may face increased risks during climate-driven events due to limited mobility, reliance on electrically powered medical equipment, or reduced access to transportation during evacuations or service disruptions. Flooding and extreme heat can also disproportionately affect older adults and people with chronic health conditions, increasing the likelihood of heat-related illness, respiratory stress, and extended recovery times following disasters.

Language and cultural barriers further compound climate vulnerability for some residents within NapaSan's service area. Areas with higher proportions of households that speak Spanish or other languages at home may face challenges accessing timely emergency information, preparedness guidance, and post-event assistance if outreach is not culturally and linguistically appropriate. During climate-related emergencies, such as floods or wildfire smoke events, delays or gaps in communication can increase exposure and limit the effectiveness of protective actions.

Climate change also intersects with housing vulnerability, particularly in neighborhoods with higher renter occupancy and older housing stock. These areas may experience greater impacts from flooding, heat stress, or utility disruptions, while residents often have limited ability to invest in property-level mitigation or recovery. For NapaSan, climate change impacts on vulnerable populations underscore the importance of maintaining reliable wastewater and recycled water services during extreme events, as service disruptions can quickly escalate public health risks in densely populated or socially vulnerable areas.

12.5.4 Hazard Problem Statements

As part of the mitigation action identification process, the Planning Committee for each jurisdiction identified areas of concern (aka problem statements) for their respective facilities based on the risk assessment and vulnerability analysis, utilizing the RAMP mapping and static snapshot maps. Problem statements focused on the impact, victim, or threat that the hazard could create in the jurisdiction, as described in Table 12-6. Identifying common issues and weaknesses through these problem statements assisted the planning group in understanding the realm of resources needed for mitigation.

The goal is to have at least one mitigation action for every problem statement. Projects or actions have been developed to mitigate each problem identified. See Table 12-8 for a full list of mitigation actions and

corresponding problem statements that they address. Each problem statement is coded with a problem number for cross-referencing between Table 12-6 and Table 12-8

Table 12-6: NapaSan Hazard Problem Statements

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-SR-NSD-001	Climate Change	Threat	**Napa Sanitation District**	Sea-level rise increases overtopping risk at pond levees, accelerates structural degradation, and compounds storm surge and tidal flooding impacts along more than 9 miles of wastewater and recycled water infrastructure.	ma-SR-NSD-001
ps-SR-NSD-002	Climate Change	Impact	**Napa Sanitation District**	Rising groundwater tables and saltwater intrusion from sea-level rise increase infiltration, buoyancy hazards, pipeline corrosion, and operational instability for gravity mains, force mains, and recycled water systems.	ma-SR-NSD-001, ma-DR-NSD-001
ps-SR-NSD-003	Climate Change	Victim	**Napa Sanitation District**	Customers in low-lying and tidally influenced areas face service interruptions or backups from SLR-driven flooding during king tides and storm conditions.	ma-SR-NSD-001
ps-CC-NSD-001	Climate Change	Threat	**Napa Sanitation District**	Climate change is causing sea-level rise, changes in precipitation patterns, and more extreme hazard events like wildfire and flood, threatening reliability of the sanitary system.	ma-SR-NSD-001, ma-DR-NSD-001, ma-FL-NSD-001, ma-WF-NSD-001, ma-AH-NSD-001
ps-DR-NSD-001	Drought	Impact	**Napa Sanitation District**	Prolonged drought reduces influent flow and recycled water availability, increasing operational strain on treatment processes and limiting summer recycled water distribution capacity.	ma-DR-NSD-001
ps-DR-NSD-002	Drought	Impact	**Napa Sanitation District**	Drought-driven low wastewater flows increase solids accumulation, odor generation, corrosion risk, and collection system maintenance needs.	ma-DR-NSD-001
ps-DR-NSD-003	Drought	Impact	**Napa Sanitation District**	Soil desiccation and subsidence during extreme drought cause pipeline misalignment, cracking, joint failures, and structural stress at utility crossings.	ma-DR-NSD-001
ps-DR-NSD-005	Drought	Victim	**Napa Sanitation District**	Recycled water customers face delivery cutbacks or quality variability during extreme drought, affecting economic and operational continuity.	ma-DR-NSD-001
ps-EQ-NSD-001	Earthquake	Impact	**Napa Sanitation District**	Strong ground shaking can disrupt treatment and collection systems, damage pipelines, and cause cascading failures in communication systems, access roads, and power infrastructure.	ma-EQ-NSD-001
ps-EQ-NSD-002	Earthquake	Threat	**Napa Sanitation District**	Aging or unreinforced assets lack modern seismic hardening, increasing risk of rupture, overflow, or structural collapse.	ma-EQ-NSD-001

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-EQ-NSD-003	Earthquake	Impact	**Napa Sanitation District**	Damage to transportation routes may prevent staff and contractors from accessing critical assets, delaying emergency repairs and restoration of operations.	ma-EQ-NSD-001
ps-EQ-NSD-004	Earthquake	Impact	**Napa Sanitation District**	Backup power systems may not provide adequate redundancy during extended post-earthquake outages, risking treatment compliance.	ma-EQ-NSD-001, ma-AH-NSD-001
ps-FL-NSD-001	Flood	Threat	**Napa Sanitation District**	Riverine flooding and storm surge threaten primary access routes to the WWTP, restricting staff mobility and delaying emergency repairs.	ma-FL-NSD-001
ps-FL-NSD-002	Flood	Impact	**Napa Sanitation District**	Flooding at West Napa, River Park, and Stonecrest pump stations, combined with increased I&I and creek erosion from heavy rain events, causes equipment damage, electrical failures, and overflow risk.	ma-FL-NSD-001, ma-AH-NSD-001
ps-FL-NSD-003	Flood	Impact	**Napa Sanitation District**	Severe flood events can force system shutdowns disrupting collection, treatment, recycled water delivery, and revenue recovery.	ma-FL-NSD-001, ma-AH-NSD-001
ps-FL-NSD-004	Flood	Victim	**Napa Sanitation District**	Operations staff face safety risks, limited access, and hazardous working conditions during flood events and emergency responses.	ma-FL-NSD-001
ps-FL-NSD-005	Flood	Victim	**Napa Sanitation District**	Low-lying neighborhoods and critical facilities are vulnerable to sewer backups and service disruptions during flood events. Downstream populations, natural areas, and critical facilities face impacts from uncontrolled discharges or bypasses if floodwaters compromise systems.	ma-FL-NSD-001
ps-FL-NSD-006	Flood	Threat	**Napa Sanitation District**	Aging collection system components and undersized drainage structures worsen localized flooding, erosion, and facility access challenges.	ma-FL-NSD-001
ps-EW-NSD-001	Severe Weather	Impact	**Napa Sanitation District**	Heavy rain events that increase I&I or lead to flooding can overwhelm wastewater infrastructure, potentially causing sanitary sewer overflows.	ma-FL-NSD-001
ps-EW-NSD-002	Severe Weather	Impact	**Napa Sanitation District**	High winds can fell trees and damage electrical infrastructure, cutting off power to critical facilities and blocking maintenance and repair access, especially at remote pump stations.	ma-AH-NSD-001
ps-SW-NSD-001	Severe Weather	Threat	**Napa Sanitation District**	Severe weather events like atmospheric rivers are becoming more frequent due to climate change, threatening treatment process interruptions and pump station operability from heavy rain and high wind events.	ma-FL-NSD-001, ma-AH-NSD-001
ps-WF-NSD-001	Wildfire	Threat	**Napa Sanitation District**	Wildfire and PSPS events threaten power supply reliability, expose critical facilities to damage, and elevate structural failure risks along pipeline corridors.	ma-AH-NSD-001, ma-WF-NSD-001

Problem No.	Hazard	Area of Concern	Primary Agency	Problem Description	Related MA
ps-WF-NSD-002	Wildfire	Victim	**Napa Sanitation District**	Extended PSPS or wildfire-driven outages may exceed on-site generator fuel capacity, risking treatment process interruptions and pump station operability.	ma-AH-NSD-001
ps-WF-NSD-003	Wildfire	Victim	**Napa Sanitation District**	Contractors and off-site personnel may be unable to access critical assets due to road closures or active fire conditions, delaying service restoration.	ma-WF-NSD-001

12.6 Mitigation Strategy

This section provides the framework for how NapaSan will reduce hazard risk within its jurisdiction while supporting the broader goals of the Napa County MJHMP. It includes an overview of existing capabilities, opportunities to strengthen resilience, and the district's prioritized mitigation actions. Together, these elements demonstrate how NapaSan integrates hazard awareness into its planning and development processes while contributing to a coordinated countywide approach.

Within the Napa County MJHMP, the mitigation strategy serves as the roadmap for future hazard mitigation efforts. For NapaSan, the strategy outlined in this annex reflects the outcomes of the countywide planning process while also addressing the district's unique risks, priorities, and community needs. The strategy is designed to reduce vulnerabilities identified in the risk assessment, including the problem statements developed for flooding, earthquakes and liquefaction, slope failure, wildfire, drought, severe storms, extreme heat, and climate change.

Mitigation actions identified in this annex include both policy-based and project-based initiatives, with an emphasis on integrating resilience into land use planning, infrastructure investments, and community programs. Actions are structured to align with FEMA's requirements and to coordinate with existing district, county, and regional planning mechanisms. Each action identifies responsible parties, potential funding sources, and the resources needed for implementation.

For NapaSan, this strategy provides a framework for strengthening resilience by combining district-led initiatives, such as infrastructure improvements, and community preparedness, with regional coordination through the MJHMP. By advancing these efforts in alignment with the Strategic Plan and other local planning documents, NapaSan enhances its ability to reduce hazard risk while supporting long-term community safety, sustainability, and economic stability.

The subsections that follow describe these elements in detail:

- **Sections 12.6.1, Capabilities and Opportunities,** provides a summary of NapaSan's capacity to address natural hazards.
- **Section 12.6.2, Mitigation Action Plan,** presents the district's prioritized actions to guide implementation in coordination with countywide strategies.

Aligning the Action Plan

This section connects NapaSan's mitigation actions with its existing capabilities and areas for growth. Capability assessments are a required element of hazard mitigation planning under the Disaster Mitigation Act of 2000 and FEMA's 2023 guidance, ensuring that actions are realistic, achievable, and aligned with available resources.

The section begins with a summary of NapaSan's capabilities across four areas: planning and regulatory, administrative and technical, fiscal, and education and outreach. This overview highlights the tools and strengths that the district already uses to reduce hazard risk. The section then provides a detailed analysis of each capability area, identifying both current practices and opportunities to expand resilience.

12.6.1 Capabilities & Opportunities

This section provides a detailed assessment of NapaSan's current capabilities to support hazard mitigation, as well as future opportunities. This consists of describing how the district is planning for hazards and growth and a summary of its existing capabilities and the potential for enhancement.

12.6.1.1 Planning for Hazards & Growth

Planning for hazards and growth is a central responsibility of NapaSan, given its role in providing essential wastewater and recycled water services to a growing and hazard-prone region. NapaSan operates within a dynamic planning environment shaped by seismic risk, flooding along the Napa River, climate change, and long-term development pressures in and around the City of Napa. To address these challenges, the district integrates hazard awareness, infrastructure resilience, and growth projections into its long-range planning, capital improvement programming, and operational decision-making.

As development occurs within NapaSan's service area, the district plans for system capacity, redundancy, and adaptability to ensure new growth does not exacerbate existing vulnerabilities. This includes aligning sewer and recycled water system expansions with local land use plans, zoning, and regional growth forecasts, while also accounting for increased demand during peak wet-weather events and long-term climate variability. Growth planning places particular emphasis on protecting infrastructure located in flood-prone and liquefaction-susceptible areas, ensuring that new facilities and system upgrades are designed to withstand anticipated hazard conditions and future regulatory requirements.

Hazard planning is embedded in NapaSan's capital improvement planning process, which prioritizes projects that reduce risk, enhance system reliability, and support rapid recovery following disasters. Investments in pipeline rehabilitation, pump station upgrades, seismic strengthening, flood resilience, and energy reliability reflect a proactive approach to managing both current and future hazards. The district also coordinates closely with Napa County, the City of Napa, flood control agencies, and emergency management partners to align its planning efforts with regional hazard mitigation strategies and emergency response frameworks.

12.6.1.2 Development & Hazard Considerations

Development and hazard considerations are closely intertwined for NapaSan due to the district's service area encompassing both established urban neighborhoods and areas influenced by environmental constraints such as floodplains, seismic hazards, and climate-related risks. As land development and redevelopment occur within the City of Napa and surrounding areas, NapaSan must ensure that wastewater and recycled water infrastructure is planned, designed, and operated in a manner that minimizes exposure to natural hazards while accommodating future growth. This requires careful coordination with local land use policies, zoning regulations, and regional planning efforts.

Much of the district's infrastructure is located in low-lying valley areas near the Napa River, where flood risk and liquefaction potential are elevated. New development in or near these areas increases the importance of designing conveyance systems, pump stations, and treatment facilities that can withstand inundation, ground movement, and prolonged service disruptions. NapaSan evaluates development proposals to ensure adequate system capacity, proper elevation of critical components, and compatibility with floodplain management requirements. Where growth occurs in hazard-prone areas, additional design standards and mitigation measures are necessary to reduce long-term risk and protect both new and existing infrastructure.

Seismic hazards also play a key role in development considerations, particularly given the proximity of active faults and the potential for strong ground shaking across the entire service area. As development intensifies, the consequences of infrastructure failure increase, reinforcing the need for seismic design standards, flexible pipeline materials, and redundancy within the system. NapaSan incorporates lessons learned from past earthquakes and scenario modeling into its planning to ensure that new facilities and system upgrades are resilient and capable of rapid post-event recovery.

Climate change adds another layer of complexity to development planning by altering hazard conditions over time. Increased precipitation intensity, longer droughts, and higher temperatures influence how infrastructure must be sized, protected, and operated. NapaSan considers these evolving conditions when planning for growth, emphasizing adaptable designs that can accommodate future uncertainty.

12.6.1.3 Capabilities & Opportunities Assessment

To develop a realistic and actionable mitigation strategy, it must account for existing jurisdictional capabilities and what future opportunities there are to enhance those capabilities for purposes of hazard mitigation. This section provides an assessment of the district's existing capabilities and future opportunities, including planning and regulatory, administrative and technical, fiscal, and public outreach and education capabilities. This assessment also identifies opportunities to integrate this MJHMP into future planning, policies, or programs to weave mitigation efforts into daily operations and address hazard problems wholistically. Capabilities are categorized into four groups and include various mechanisms.

- **Planning and Regulatory Capabilities:** Existing long-range plans, emergency response plans, hazard-specific plans, land use policies, and building and development standards.

- **Administrative and Technical Capabilities:** Available expertise in emergency services, engineering, grant management, and community planning.
- **Fiscal Capabilities:** Budgetary capacity, taxing authority, grants, and other funding mechanisms that can support mitigation projects.
- **Outreach and Education Capabilities:** Existing programs for providing technical assistance, community education, public warnings, and stakeholder engagement.

A full description of the process used to develop the capabilities assessment is provided in Volume 1, Section 2.3.3.

This capabilities and opportunities assessment for NapaSan lists the various types of capabilities along with how they have been, currently are, or will in the future be integrated into hazard mitigation planning efforts. The three "HMP Integration" columns that identify the capability's status and usage are color-coded with green, yellow, or orange shading to communicate the following:

- **Status:** If the capability is present at all and what level of use it has generally.
- **Current Mitigation Use:** If the capability is currently being used in mitigation efforts, specifically, and at what level.
- **Future Opportunity:** If there is a future opportunity to integrate the capability into mitigation efforts and at what level.

Summary of Capabilities & Opportunities

This Capabilities and Opportunities Assessment for NapaSan summarizes the various types of capabilities it has for hazard mitigation currently. The assessment also identifies opportunities to integrate, expand, and improve the district's capabilities for future hazard mitigation. Table 12-7 provides a comprehensive list of capabilities and identifies the current status, current mitigation use, and future opportunities.

Planning & Regulatory

NapaSan demonstrates strong planning and regulatory capabilities, with hazard mitigation primarily integrated into long-range planning, capital investment, and regulatory compliance efforts. The district's 10-Year Capital Improvement Plan is a key strength, supporting infrastructure reliability, resource recovery, and system resilience through projects such as aging asset rehabilitation, inflow and infiltration reduction, pump station upgrades, and wastewater treatment plant improvements.

Although NapaSan does not maintain standalone plans for fire prevention, seismic safety, earthquake modernization, or floodplain response, these hazards are addressed through master planning, asset condition assessments, system capacity analysis, and capital programming. Seismic and building safety needs are incorporated into the Wastewater Treatment Plant Master Plan and Collection System Master Plan, while flood risk is addressed through capacity improvements, I&I reduction, stormwater coordination, and NPDES compliance.

NapaSan also has strong capabilities related to climate action, drought management, groundwater planning, stormwater coordination, and public outreach. The 2023 Climate Change Mitigation Plan, regional drought planning, recycled water system planning, and conservation outreach all support long-term resilience. Overall, NapaSan has a mature and integrated approach to hazard mitigation, with opportunities to strengthen its program through more formal hazard-specific planning and expanded coordination on wildfire and flood resilience.

Future integration of the MJHMP will occur through various processes and mechanisms outlined across multiple mitigation actions (Table 12-8). Key opportunities for future hazard mitigation integration with the districts existing planning mechanisms include using the updated risk assessment, hazard-specific vulnerability findings, and projected climate change impacts to inform implementation of the I&I Reduction & Flood Resilience Program (ma-FL-NSD-001), SLR Resilience Program (ma-SR-NSD-001), and Recycled Water Reliability & Drought Resilience Program (ma-DR-NSD-001).

Administrative & Technical

NapaSan's administrative and technical capabilities reflect a lean organizational structure that relies on cross-trained staff and integrated management rather than dedicated hazard-specific positions. The district does not have a designated Emergency Manager; instead, emergency management responsibilities are assumed by the General Manager and operations and maintenance supervisors during incidents. While this structure allows for flexibility and direct operational oversight, it also presents an opportunity to further formalize emergency management roles and succession planning as hazards and regulatory expectations continue to increase.

Technical capacity is a notable strength for NapaSan, particularly in engineering and infrastructure delivery. The district maintains strong in-house civil engineering expertise through its Capital Program Manager and Senior Civil Engineer, supporting the planning, design, and implementation of capital projects that enhance system reliability and hazard resilience. This technical foundation enables NapaSan to proactively address aging infrastructure, seismic considerations, flood exposure, and climate-related risks through its capital improvement program and master planning efforts.

Administrative support functions such as public outreach, GIS, and grant management are handled by existing staff rather than dedicated specialists. Outreach activities are coordinated through Administrative Services and communications functions, while GIS capabilities are integrated into the district's computerized maintenance management system and asset management processes. Similarly, grant identification and administration are managed by Finance staff as part of broader fiscal responsibilities. While these approaches are effective for current operations, expanding capacity in these areas could enhance NapaSan's ability to pursue external funding, improve hazard-related data analysis, and strengthen community engagement.

Overall, NapaSan's administrative and technical capabilities support effective day-to-day operations and long-term infrastructure planning, but continued growth, increasing hazard complexity, and evolving regulatory requirements may warrant additional staffing or formalized roles. Enhancing emergency

management coordination, GIS capacity, and grant development resources would further strengthen the district's ability to implement hazard mitigation projects and sustain resilient service delivery.

Warning Systems & Services

NapaSan benefits from a combination of regional warning systems and internal operational monitoring tools to support situational awareness during hazard events. For general emergencies, the district relies on Napa County's public alert systems, including Nixle and County Alert, to receive timely notifications related to evacuations, severe weather, and other regional hazards. Internally, NapaSan uses its computerized maintenance management system and SCADA alarms to monitor system performance, detect operational anomalies, and respond quickly to equipment failures or abnormal conditions, providing a strong foundation for operational warning and response.

Flood warning capabilities are primarily based on monitoring and coordination rather than a dedicated District-specific alert system. NapaSan tracks river discharge, rainfall, and system performance and coordinates closely with the City of Napa and Napa County flood managers during storm events. While this approach allows the district to respond to changing conditions, it presents an opportunity to formalize flood-specific thresholds or protocols that link external river forecasts with internal operational triggers.

Wildfire and geological hazard warnings are similarly addressed through regional and state systems rather than standalone District programs. NapaSan relies on County and Cal Fire alerts for wildfire-related warnings and situational updates, including evacuation information and public safety power shutoff notifications. For earthquakes, the district does not maintain a dedicated seismic warning system but benefits from statewide and federal tools such as the USGS ShakeAlert system, which provides limited early warning prior to strong ground shaking.

Overall, NapaSan's warning systems and services are effective in leveraging regional resources and internal monitoring capabilities, but they remain largely decentralized. Formalizing hazard-specific response protocols tied to existing warning systems—particularly for floods, wildfires, and seismic events—could further strengthen preparedness and improve the district's ability to proactively protect critical infrastructure and maintain service continuity during emergencies.

Fiscal

NapaSan has strong fiscal capabilities to support hazard mitigation, primarily through utility-based revenue mechanisms and long-term capital planning rather than voter-approved taxes or special financing tools. The district's primary and most reliable source of funding for mitigation-related investments is its sewer service fees, which provide a stable revenue stream to support operations, maintenance, and capital improvements that reduce vulnerability to hazards. In addition, system development fees assessed on new development help ensure that growth contributes proportionately to infrastructure capacity and resilience.

NapaSan has historically relied on a pay-as-you-go financing approach and has made limited use of general obligation bonds or special tax bonds. While this conservative fiscal strategy supports financial stability and

minimizes long-term debt, it may also limit the district's ability to rapidly scale large mitigation projects without phased implementation. Voter-approved levies for specific purposes are not currently used, representing a potential but unrealized funding option for future hazard mitigation needs.

Although NapaSan does not maintain an explicit policy to withhold spending in hazard-prone areas, hazard considerations are incorporated into capital improvement prioritization. The district's 10-Year Capital Improvement Program serves as the central fiscal tool for hazard mitigation, integrating asset management, inflow and infiltration reduction, recycled water system improvements, and climate adaptation projects. By directing capital funding toward rehabilitation, system hardening, and reliability upgrades, particularly in areas of known flood, seismic, or climate risk, NapaSan effectively reduces long-term exposure while maintaining fiscal discipline.

Overall, NapaSan's fiscal capabilities support a proactive, infrastructure-focused approach to hazard mitigation. Continued integration of hazard risk into capital planning, along with exploration of additional financing mechanisms or grant opportunities, could further enhance the district's capacity to address emerging risks and implement large-scale resilience projects as conditions evolve.

Education & Outreach

NapaSan demonstrates strong education and outreach capabilities, particularly in areas related to drought awareness, water conservation, and customer engagement. The district maintains a public-facing website that provides information on water conservation practices and drought conditions, supporting community understanding of water resource challenges and the role of wastewater and recycled water systems in long-term resilience. NapaSan also actively uses social media, particularly Facebook, to share timely information and updates related to drought conditions, conservation messaging, and District activities.

NapaSan regularly participates in community events, including local fairs, water conservation days, and public outreach initiatives, which provide opportunities to engage directly with residents, businesses, and agricultural users. These events support education on water use efficiency, recycled water benefits, and the importance of maintaining reliable wastewater services. In addition, the district provides technical assistance to the public and customers on wastewater-related issues and conservation practices, helping address questions and concerns that may arise during droughts or other hazard conditions.

Printed outreach materials, including newsletters and billing inserts, are used to reinforce key messages and reach customers who may not access information online or through social media. This multi-channel approach enhances the district's ability to communicate consistently across diverse audiences. While NapaSan does not maintain formal partnerships with Fire Safe Councils or the Napa County Resource Conservation District for hazard outreach, these organizations represent future opportunities for collaboration, particularly related to wildfire resilience and infrastructure protection. Overall, NapaSan's education and outreach capabilities support public awareness and preparedness, with a strong foundation that can be expanded to address a broader range of hazard mitigation topics over time.

ASSESSMENT LEGEND

HMP Integration

Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Table 12-7: NapaSan Capabilities and Opportunities Assessment

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Planning and Regulatory Capabilities				
Hazard Reduction Programs (Annually Conducted)				
Capital Improvements Program (CIP) or Plan				10-Year Capital Improvement Plan directly tied to Strategic Plan Goals (Infrastructure Reliability, Resource Recovery; updated annually with focus on rehabilitation, inflow & infiltration (I&I) reduction, pump station upgrades, and plant reliability projects
Annual Fire Prevention Plan				No standalone plan; addressed through OSHA compliance, Cal/OSHA workplace requirements, and facility-level fire protection measures (chemical storage, digester safety); future opportunity
Seismic Safety Program (Non-structural)				No standalone program; seismic evaluations conducted through WWTP Master Plan and asset condition assessments; retrofits addressed through CIP and Master Plan projects; future opportunity
Earthquake Modernization Plan (Building Safety)				No formal plan; facilities assessed in WWTP Master Plan and Collection System Master Plan; future opportunity
Stormwater Management Program (Annual Inspections)				WWTP Master Plan and permit compliance (NPDES) require stormwater monitoring and management; inspections conducted annually for treatment facilities and collection systems

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
Hazard Plans and Programs				
Floodplain Response Plan				No standalone floodplain response plan; considered in the Collection System Master Plan (capacity, I&I) and WWTP Master Plan; future opportunity to coordinate with City/County
Community Wildfire Protection Plan (CWPP)				Does not currently participate in Napa County CWPP; future opportunity to integrate protection wastewater assets
Ground Water Management Planning / Plans				Participates in regional water planning efforts through Collection System Master Plan, Recycled Water Strategic Plan, and WWTP Master Plan
Climate Action Plan				2023 Climate Change Mitigation Plan addresses GHG emissions reduction goals and adaptation
Drought Mgmt/ Contingency Plan				Participates in Napa County Drought Contingency Plan and coordinates with City of Napa on potable reuse studies; maintains Water Conservation Program page and integrates drought response with recycled water supply
FireWise Communities within District				Napa Firewise Foundation; future opportunity to collaborate
Hazard-Related Public Outreach Program				Conducts outreach on drought hazard through community events, Board updates, newsletters, and water conservation campaigns (Strategic Plan Goal 5)
Administrative and Technical				
Staff Capacity				
Emergency Manager				Incident Commander (General Manager) as designated Emergency Manager
Civil Engineer				Engineering Director/District Engineer
Dedicated Public Outreach Personnel				Public Information and Outreach Specialist
GIS Specialist and Capability				Engineers and Technicians manage GIS
Grant Manager, Writer, or Specialist				No dedicated grant manager; functions performed by Finance staff
Other	N/A	N/A	N/A	
Warning Systems/Services				

Resource	HMP Integration: Status	HMP Integration: Current Mitigation Use	HMP Integration: Future Opportunity	Notes / Additional Detail
General				Nixle / County Alert systems for general warnings; internally uses CMMS and SCADA alarms
Flood				No dedicated flood warning system; monitors river discharge and coordinates with City/County flood managers
Wildfire				No dedicated wildfire warning system; County/CalFire alerts
Geological Hazards				No dedicated seismic warning system; regional/state systems (USGS ShakeAlert)
Fiscal Capabilities				
Financial Resources for Hazard Mitigation				
Levy for Specific Purposes with Voter Approval				Not currently used
Utilities Fees				Sewer service fees
System Development Fee				Capacity charges on new development
General Obligation Bonds to Incur Debt				Historically relies on pay-as-you-go financing; limited use of general obligation bonds
Special Tax Bonds to Incur Debt				Not currently used
Withheld Spending in Hazard-Prone Areas				No explicit policy; futue opportunity via CIP
Stormwater Service Fees	N/A	N/A	N/A	Does not provide stormwater services
Capital Improvement Project Funding				10-Year CIP integrates asset management, I&I reduction, recycled water, and climate adaptation project
Education / Outreach Capabilities				
Education/Outreach Resources				
Website Dedicated to Hazard Topics				Website provides information on drought and water conservation
Dedicated Social Media				Actively uses Facebook to communicate about drought
Hazard Info. Avail. at Library/ Planning Desk	N/A	N/A	N/A	Not within district scope
Annual Public Safety Events				Regularly participates in community fairs, water conservation days, and drought outreach

Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Ability to Field Public Tech. Assistance Requests				Provides assistance related to wastewater and water conservation
Public Safety Newsletters or Printed Outreach				Newsletters and billing inserts
Fire Safe Councils				Local Fire Safe Councils; future opportunity to coordinate on infrastructure protection
Resource Conservation Districts				Napa County RCD; future opportunity to collaborate
Other	N/A	N/A	N/A	

12.6.2 Napa Sanitation District Mitigation Action Plan

NapaSan's mitigation actions were developed through a collaborative process informed by the updated risk assessment, local priorities, and extensive stakeholder engagement. As part of this 2026 MJHMP update, the district reviewed mitigation actions from its prior Local Hazard Mitigation Plan to determine which actions to carry forward, which to consolidate, and where entirely new strategies were required. This careful evaluation ensured that the updated action plan builds upon past commitments while also responding to current risks and future challenges.

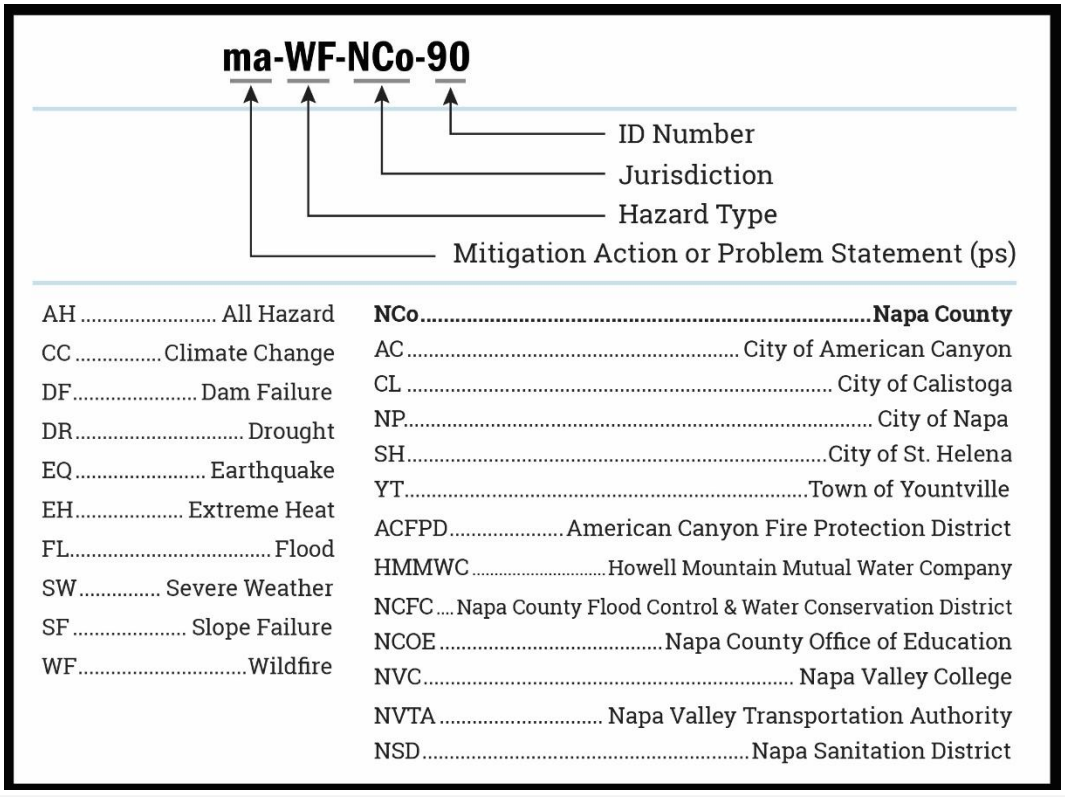


Figure 12-21: Mitigation Action Number Key

The plan addresses NapaSan's most significant hazards, including wildfire, earthquake, flood, drought, and climate change. Each mitigation action is designed to align with FEMA's hazard mitigation guidance and the requirements of the Disaster Mitigation Act of 2000. Where appropriate, overlapping or redundant actions were consolidated into broader, more comprehensive strategies that improve clarity, increase feasibility, and strengthen regional coordination.

The mitigation action prioritization method used by all participating jurisdictions is described in Volume 1, Section 4. Each action specific to NapaSan is documented in Table 12-8, which identifies the responsible department, implementation timeframe, potential funding sources, and resources required to complete the action. Each action is also assigned a unique alphanumeric identifier (see Figure 12-21) that links the strategy to its associated hazard and supports consistent monitoring and reporting.

NapaSan's approach recognizes that some hazards are most effectively addressed through regional efforts. Flood protection, drought resilience, and wildfire risk reduction often extend beyond the district's boundaries and require collaboration with county, regional, and state partners. By aligning local actions with regional strategies, NapaSan helps to consolidate resources, maximize funding opportunities, and ensure

that mitigation projects achieve the greatest benefit for San Pablo Bay, the Napa Valley, and the wider Napa County community.

Collectively, these mitigation actions provide a roadmap for reducing hazard risk, protecting vulnerable populations, and strengthening the long-term resilience of NapaSan.

Table 12-8: NapaSan Mitigation Action Plan

Mitigation No.	Hazard Type	Sub-Hazard	Mitigation Type	Year	Primary Agency	Title	Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Problem Statements
ma-AH-NSD-001	All Hazard		PPRO - Property Protection , SP - Structural Projects	2026	Napa Sanitation District	Power Reliability & Microgrid Project	Install microgrid, battery storage, and generator fuel-resilience improvements at critical pump stations and the WWTP.	Engineering	Medium	High	3-5 Years	Project	HMGP / BRIC , General Fund	High	ps-EQ-NSD-004, ps-SW-NSD-002, ps-SW-NSD-001, ps-WF-NSD-001, ps-WF-NSD-002, ps-FL-NSD-002, ps-FL-NSD-003, ps-CC-NSD-001
ma-CC-NSD-001	Climate Change	Sea Level Rise	PPRO - Property Protection , NRP - Natural Resource Protection , SP - Structural Projects	2026	Napa Sanitation District	SLR Resilience Program	Elevate and reinforce WWTP oxidation pond levees, improve seepage controls, and reduce SLR-driven overtopping risk. Improve access, raise manholes, and add protective design features in tidally influenced neighborhoods. Replace vulnerable pipes, add backflow protection, and upgrade corrosion-prone assets in SLR-affected basins.	Engineering	High	High	5-10 Years	Project	HMGP / BRIC , General Fund	Medium	ps-CC-NSD-001, ps-CC-NSD-001, ps-CC-NSD-002, ps-CC-NSD-003
ma-DR-NSD-001	Drought		NRP - Natural Resource Protection , SP - Structural Projects	2026	Napa Sanitation District	Recycled Water Reliability & Drought Resilience Program	Implement systemwide upgrades to expand recycled water storage, improve collection and treatment reliability during heatwaves, and ensure consistent delivery during multi-year droughts.	Engineering	High	High	3-5 Years	Project	HMGP / BRIC , General Fund	High	ps-CC-NSD-002, ps-DR-NSD-001, ps-DR-NSD-002, ps-DR-NSD-003, ps-DR-NSD-005, ps-CC-NSD-001
ma-EQ-NSD-001	Earthquake		PPRO - Property Protection , SP - Structural Projects	2026	Napa Sanitation District	Seismic Hardening of Treatment Facilities & Collection System	Improve resilience of facility access routes and retrofit critical treatment units, pump stations, and high-consequence pipelines vulnerable to shaking.	Engineering	High	High	5-10 Years	Project	HMGP / BRIC , General Fund	High	ps-EQ-NSD-001, ps-EQ-NSD-002, ps-EQ-NSD-003, ps-EQ-NSD-004
ma-FL-NSD-001	Flood		NRP - Natural Resource Protection , SP - Structural Projects	2026	Napa Sanitation District	I&I Reduction & Flood Resilience Program	As directed by the CSMP, implement targeted I&I control projects in basins most affected by flooding and atmospheric river events. Floodproof electrical systems, elevate controls, add barriers, and improve all-weather access to West Napa, River Park, Stonecrest, and other high-risk pump stations.	Engineering	Medium	High	3-5 Years	Project	HMGP / BRIC , General Fund	High	ps-FL-NSD-001, ps-FL-NSD-002, ps-FL-NSD-003, ps-FL-NSD-004, ps-FL-NSD-005, ps-FL-NSD-006, ps-SW-NSD-001, ps-SW-NSD-001, ps-CC-NSD-001
ma-WF-NSD-001	Wildfire		PPRO - Property Protection , NRP - Natural Resource Protection	2026	Napa Sanitation District	Wildfire Hardening & Vegetation Management	Protect exposed critical facilities and infrastructure in fire-prone corridors through structure hardening and vegetation management.	Engineering	Medium	High	3-5 Years	Project	HMGP / BRIC , General Fund , CalFIRE	Medium	ps-WF-NSD-003, ps-WF-NSD-001, ps-CC-NSD-001



Presented by Brieanna Jones

7/21/2026

OES NAPA COUNTY
OFFICE OF EMERGENCY SERVICES

Multi-Jurisdictional Hazard Mitigation Plan

Why have a MJHMP?



Goal 1: Protect people from loss of life, injury, and economic damage from hazards.

Goal 2: Protect critical facilities, infrastructure, property, and the continuity of essential services from hazards.

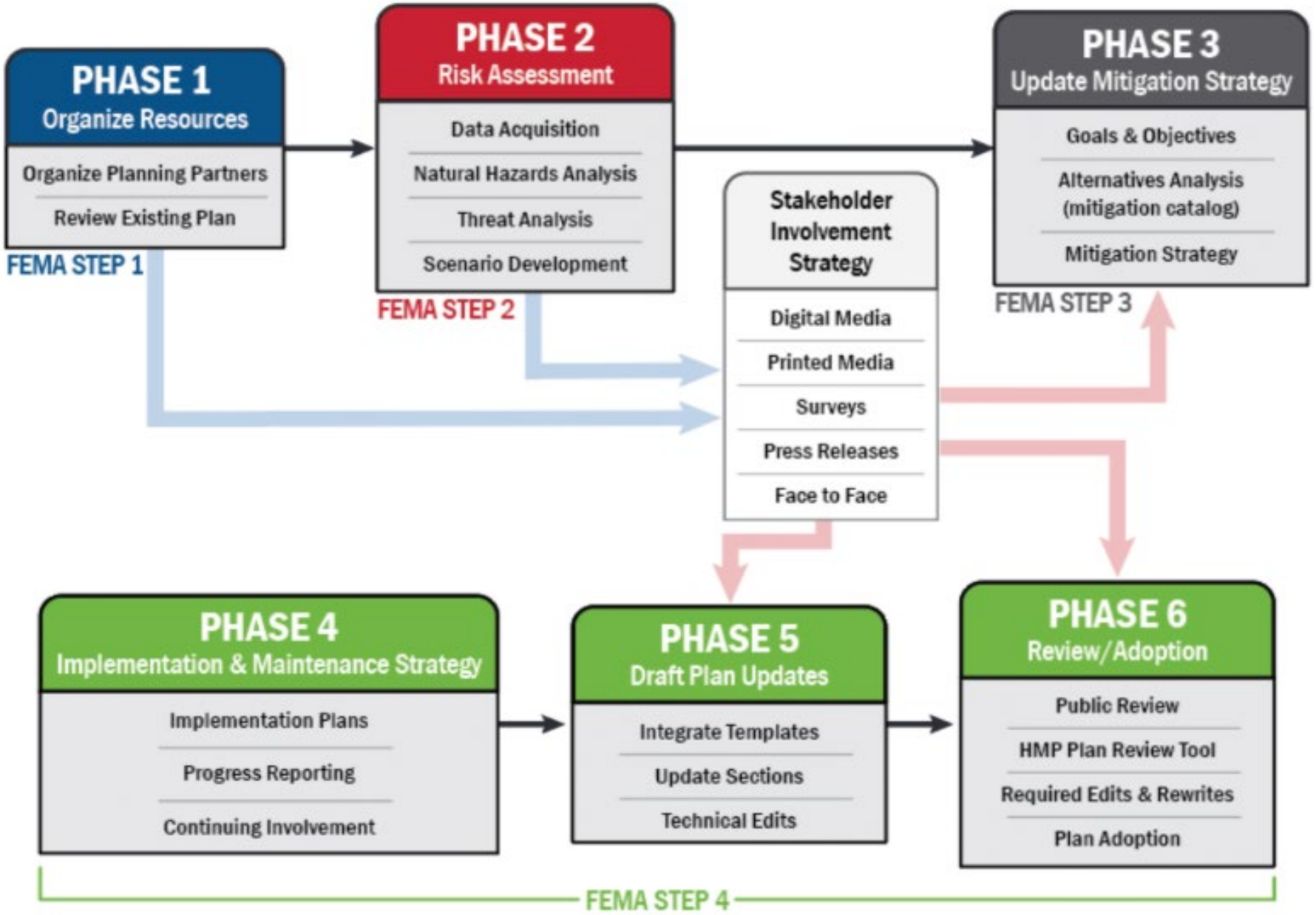




Goal 3: Preserve natural resources and ecological functions as hazard mitigation.

Goal 4: Promote community resilience through planning, policies, capital improvements, education, and inter-jurisdictional collaboration.





Phases of Development

Background

In 2020, Napa County successfully met all approval requirements outlined in DMA 2000, Title 44 CFR § 201.6, and California SB 379 before officially adopted its 2020 MJHMP. This plan has been updated from the earlier plan and incorporated elements from Napa County's 2023 General Plan and other long-range planning mechanisms, as well as those of other participating jurisdictions. Guided by input from hazard mitigation stakeholders, several improvements were Implemented for the 2026 update, including:

2020 vs. 2026

- **Focused on Priority Hazards**: The hazard mitigation plan stakeholders decided to prioritize natural hazards over human-caused ones for the 2026 update. In particular, pandemic disease was identified as better suited for inclusion in other plans like the Emergency Operations Plan. In addition , this update recognizes recent shifts in severe weather hazard concerns, focusing on heavy rain, high wind, and winter weather as subhazards and increasing emphasis on extreme heat by profiling it separately.
- **Assessed Local Mitigation Progress**: The 2026 update included a review of progress made in local mitigation efforts since the 2020 MJHMP, ensuring continuity and identifying areas for improvement.
- **Enhanced Partnerships**: Strong partnerships among the county, municipals, special districts, and agency partners, were reinforced, emphasizing a collaborative approach and county-wide mitigation efforts.
- **Climate Change and FEMA Planning Guidance**: The 2026 MJHMP update has been aligned with the latest California and FEMA guidelines, which emphasize the integration of climate change considerations into hazard mitigation planning. Given the increasing impact of climate change in Napa Conty, and associated hazard risks, the updated plan includes comprehensive strategies to address evolving concerns that climate adaption and resilience measures are equably prioritized.

- **In 2020**: 9 jurisdictions were involved.
  - Plan was adopted June 9, 2020
- **In 2025**: 13 jurisdictions were involved.

Jurisdictions Involved

Napa County

Napa County

Municipalities

City of American Canyon

City of Calistoga

City of Napa

City of St. Helena

Town of Yountville

Special Districts

Howell Mountain Mutual Water Company

Napa County Flood Control and Water Conservation District

Napa County Office of Education

Napa Valley College

Napa Valley Transportation Authority

NapaSan

American Canyon Fire Protection District

Hazard Type	Explanation
Climate Change	High priority county-wide, profiled hazard.
Dam failure	High priority county-wide, profiled hazard.
Drought	High priority county-wide, profiled hazard
Earthquake/ Geologic Hazards	High priority county-wide, profiled hazard
Extreme Heat	Profiled as part of Severe Weather hazard
Extreme Cold	Profiled as part of Severe Weather hazard
Flood	High priority county-wide, profiled hazard
Hail	Profiled as part of Severe Weather hazard
Hazardous Material	While hazardous materials can release and impact the County, there are better avenues to address this hazard outside this Plan.
High Winds/ Straight Line Winds	High priority county-wide, profiled as part of Wildfire and Severe Weather hazards
Infestation	High priority county-wide, profiled as part of Ag Disaster hazard
Lightning	While lightning does occur in Napa County, no property damage, injuries, or death have been reported since 2000; not a priority in the County
Pandemic Disease	High priority county-wide, profiled hazard.
Severe Thunderstorm	While severe thunderstorms can occur in Napa County, no property damage, injuries, or death have been reported since 2000; not a priority in the County
Slope Failure	High priority county-wide, profiled hazard
Terrorism/Human Caused Threats	While terrorism is certainly a threat to the County and participating jurisdictions, it is best addressed in other plans as this HMP does not address human caused threats.
Tornado	Impacts to the County from tornados are extremely unlikely, if any.
Volcanic Activity	Due to distance from volcanoes and the limited chance of an eruption, this hazard was not identified as a priority.
Wildfire	High priority county-wide, profiled hazard
Winter Storm	Profiled as part of Severe Weather hazard

Napa County has received 28 federal disaster declarations since 1953, some of which were statewide, including:



9 Wildfires



2 Earthquakes



11 Severe Storms / Weather



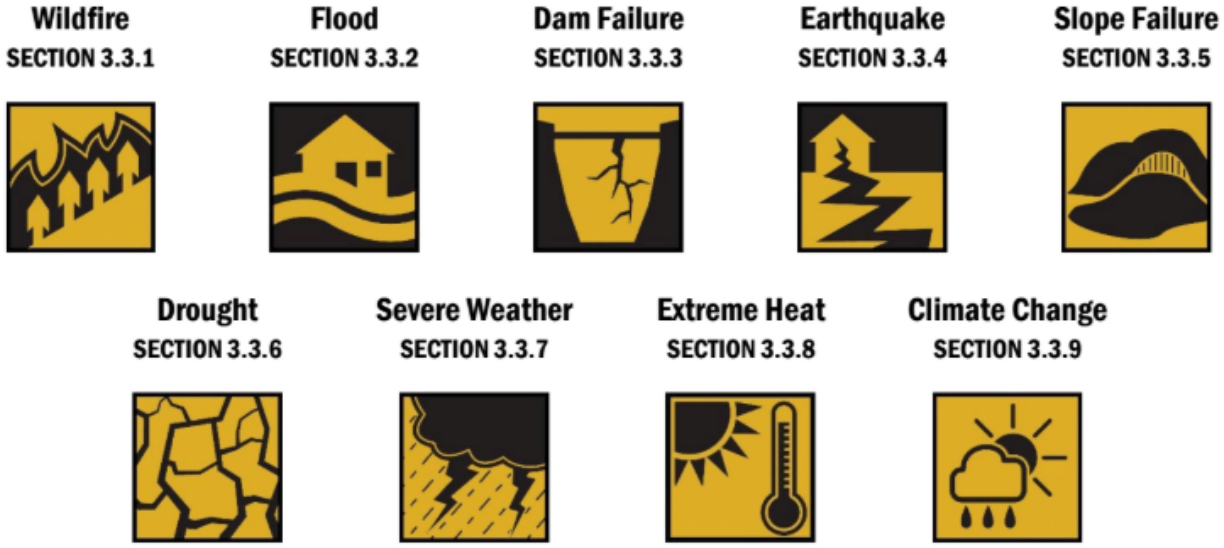
1 Drought



5 Floods

Severe weather and flooding events are most likely to occur in the winter months, with ten of the 29 federally-declared disasters occurring in January and February. Wildfires have typically occurred in the late summer, with 8 wildfire declarations from July through October.

2020 Hazard prioritization for the county and information about previous disasters



2025 Hazard Concerns

Wildfire Exposure

Exposure to the high and very high fire hazard severity zones

- 17,058 people at risk

Flood Exposure

Exposure to the 100-year and 500-year FEMA flood zones

- 20,141 people at risk

Dam Inundation Exposure

Exposure to the California DWR EAP statewide dam inundation zones

- 20,654 people at risk

Earthquake Exposure (M6.7 West Napa)

Exposure to the USGSD shaking scenario – very strong & severe

- 118,919 people at risk

Earthquake Exposure (M7.1 Hunting Creek Berryessa)

Exposure to the USGSD shaking scenario – very strong & severe

- 71,194 people at risk

Slope Failure Exposure

Exposure to high CGS landslide susceptibility

- 9,224 people at risk

Sea Level Rise Exposure

Exposure to the NOAA 0-6 foot sea level rise zones



Where do we go from here?



Q&A

Thank you for attending

Agenda Report to the Planning Commission

Agenda Section: SCHEDULED MATTERS
Department: Community Development Department - Planning Division

DATE:	July 21, 2026
FILE NUMBER:	N/A
SUBJECT:	Fiscal Year 2026-27 Planning Commission Work Plan
LOCATION OF PROPERTY:	N/A
APN:	N/A
GENERAL PLAN/ ZONING:	N/A
APPLICANT:	N/A
PROJECT PLANNER:	Natalie Bresee, Assistant Planner
REVIEWED BY:	Leza Mikhail, Community Development Director
CEQA DETERMINATION:	Not a CEQA Project (CEQA Guidelines §15378)
RECOMMENDED ACTION:	Receive, discuss, and recommend City Council approval of the proposed Fiscal Year (FY) 2026-27 Planning Commission Work Plan regarding Commission priorities for the upcoming fiscal year.

BACKGROUND:
On July 7, 2026, at the Special Planning Commission Meeting, at the direction of the Chair, the Planning Commission continued the 2026 Planning Commission Work Plan to the Regular Planning Commission Meeting on July 21, 2026.

The Planning Commission serves as the City's advisory body on land use planning matters. Its responsibilities include reviewing development applications, making recommendations to the City Council on policy and legislative matters, and implementing the General Plan, Zoning Code, and other adopted City plans and regulations. The Commission also provides a public forum for review of planning matters and helps ensure that development proposals are evaluated for consistency with applicable City requirements.

The City is currently in the process of establishing uniform and prescribed annual work plans for each of its committees and commissions for approval and alignment with City Council goals and available resources by department. The Fiscal Year 2026-27 Planning Commission Work

Plan (PC Work Plan) identifies anticipated projects, policy initiatives, recurring responsibilities, and study session items expected to come before the Planning Commission during the upcoming fiscal year. The PC Work Plan is intended to support agenda planning, public transparency, and coordination with City Council priorities. It is guided by adopted Council objectives related to housing, zoning code updates, community enhancement, economic development, permit streamlining, public engagement, interdepartmental coordination, and organizational effectiveness.

Several PC Work Plan items are also driven by State housing law, statutory review deadlines, applicant-submitted development applications, and previously initiated policy work directed by the City Council, City Manager and/or Department Director. Accordingly, the PC Work Plan is intended to remain flexible and may be adjusted as priorities, legal requirements, staff capacity, and City Council direction evolves.

The Planning Commission's bylaws establish the Commission's meeting schedule, order of business, and meeting procedures, including scheduled matters and agenda forecasting. The PC Work Plan functions within that existing procedural framework. It does not amend the bylaws, establish new procedural rules, or authorize the Commission to make informal or advance decisions or directives on potential future development applications or policy projects.

PROJECT DESCRIPTION:
N/A

ANALYSIS:
Discussion
During FY 2026-27, the Planning Commission is expected to continue its regular development review responsibilities while also considering several policy initiatives, code amendments, and study session items. These efforts support implementation of the General Plan, Housing Element, State housing laws, and City Council priorities.

The Work Plan is organized into topics that address the following categories:

- Current Planning and Development Review;
- Housing and State Mandate Implementation;
- Long-Range Planning and Policy Initiatives;
- Community Development / Economic Development;
- Infrastructure / Environmental Coordination;
- Commission Development and Public Engagement,
- Prior Fiscal Year Achievements and Decisions.

Current planning responsibilities will include review of discretionary applications requiring Planning Commission action or recommendation, including design review, use permits, subdivisions, variances, historic resource-related applications, and other applications processed pursuant to the Municipal Code. The timing and number of these items will depend on applicant submittals, completeness review, environmental review, statutory deadlines, and

staff capacity.

Housing-related work is expected to remain a significant part of the Commission's agenda. Anticipated items include Housing Element implementation, amendments needed to maintain consistency with State housing law, and potential updates to support objective standards, permit streamlining, and housing production.

Long-range planning and policy work is expected to include targeted zoning code amendments and cleanup items to correct inconsistencies, improve clarity, address implementation issues, and align the Municipal Code with the General Plan, Housing Element, and State law. This may include items already underway, such as amendments related to on-site storage uses, as well as future amendments related to objective development standards, accessory uses, entitlement procedures, or other zoning code provisions identified through implementation. To the extent planning-related issues arise from broader City initiatives, staff may bring items to the Planning Commission for review or input as appropriate.

The PC Work Plan is a flexible agenda-management tool that maintains the priorities of staff to balance workloads, resources and City Council goal alignment. Items may be added, removed, deferred, or reprioritized based on City Council direction, statutory mandates, applicant-driven project timelines, staff and consultant availability, public hearing requirements, and emerging legislative requirements, or as directed by the City Council or City Manager. Staff recommends that the Planning Commission receive, discuss, and approve the FY 2026-27 PC Work Plan.

Additional Information
To help introduce and frame the FY 2026-27 Planning Commission Work Plan, staff has prepared a proposed mission statement for Planning Commission consideration. The mission statement is intended to provide a concise summary of the Planning Commission's role in guiding land use and development decisions, implementing adopted City policies, and supporting the long-term interests of the community.

Staff is requesting Planning Commission input on the proposed mission statement and any recommended revisions before it is incorporated into the final Work Plan:

> *The City of St. Helena Planning Commission is a five-member body of community representatives appointed by the City Council. The goal of the Planning Commission is to guide land use and development decisions that implement the City's General Plan, preserve the unique character of St. Helena, promote housing opportunities, protect community resources, and ensure that growth occurs in a manner that benefits current and future residents.*

Fiscal Impact
The proposed PC Work Plan identifies projects and initiatives that will be completed through existing Community Development Department staffing resources and consultant support as authorized through the City Council adopted budget.

ISSUES:

Staff has not identified any issues with the Fiscal Year 2026-27 Planning Commission Work Plan

CORRESPONDENCE:
No correspondence has been received at the time of the agenda posting.

STAFF RECOMMENDATION:
Receive, discuss, and recommend City Council approval of the proposed Fiscal Year (FY) 2026-27 Planning Commission Work Plan regarding Commission priorities for the upcoming fiscal year.

ATTACHMENTS:
1. Adopted PC By Laws
2. Fiscal Year 2026-27 PC Work Plan

CITY OF ST. HELENA

RESOLUTION NO. 2018-116

Resolution of the Council of the City of St Helena adopting revisions to the City of St Helena Planning Commission By-Laws

RECITALS

The City Council of the City of St. Helena hereby resolves as follows:

A. Whereas, the City of St. Helena Planning Commission voted unanimously to amend its By-Laws at its Regular Meeting on July 17, 2018; and

B. Whereas, the City of St Helena Protocol for Committees, Commissions and Boards requires City Council approval of any modifications to the By-Laws of a Committee, Commission or Board.

RESOLUTION

Therefore, the City Council of the City of St. Helena hereby resolves as follows:

1. This action is not a project under the California Environmental Quality Act; and
2. The City Council authorizes amendments to the City of St Helena Planning Commission By-Laws and are hereby approved, as amended by the Planning Commission on July 17, 2018 (attached).

Approved at a Regular Meeting of the St. Helena City Council on August 28, 2018, by the following vote:

Mayor Galbraith:	Yes
Vice Mayor White:	Yes
Councilmember Koberstein:	Yes
Councilmember Dohring:	Yes
Councilmember Ellsworth:	Yes

APPROVED:

Alan Galbraith, Mayor

ATTEST:

Cindy Tzafopoulos, City Clerk

CITY OF ST. HELENA Incorporated March 24, 1878 Re-incorporated May 14, 1889 STATE OF CALIFORNIA

ST. HELENA PLANNING COMMISSION

BY-LAWS

The following rules shall be applicable to the organization of the St. Helena Planning Commission, to the convening or calling of meetings, and to the transaction of business when the Commission has convened and acts or serves in an official capacity, pursuant to law.

ORGANIZATION AND ELECTION AND DUTES OF OFFICERS

RULE 1. The Commission shall elect a Chairperson and Vice Chairperson and designate a Secretary at the first regular meeting of the Planning Commission in July to serve for a period of one year from the date of their election. However, the Planning Commission, by majority vote, may choose to elect a Chairperson or Vice-Chairperson at a different meeting to address a resignation. In the case of a resignation of the Chair, the Vice-Chair shall become the interim Chair until formal election of a new Chairperson occurs.

RULE 2. The Chairperson of the Planning Commission shall preserve order and decorum and shall decide questions of order. The Vice Chairperson shall preside in the absence of the Chairperson.

RULE 3. The Chairperson of the Planning Commission may second any motion and present and discuss any matter as a member of the Commission without having to step down from the Chair and shall be entitled to vote on all matters before the Planning Commission.

RULE 4. The Secretary shall be a City Employee, normally the Planning Director.

RULE 5. The Secretary shall be responsible for the preparation of the Planning Commission minutes and shall assure that all official actions or decisions by the Commission shall be recorded within the minutes. Consistent with Municipal Code section 2.60.030, the Commission shall keep a public record of its resolutions, transactions, findings and determinations. Those records are kept as minutes that summarize Commission action, in the same manner as City Council minutes.

RULE 6. The City Attorney of the City of St. Helena shall be the legal counsel to the Planning Commission.

RULE 7. The video recordings of each meeting are designated as the official record of the Planning Commission agenda and action and are to be made available on the City of St Helena website.

SCHEDULE OF MEETINGS

RULE 8. The Planning Commission shall hold at least two Regular Meetings per month, which shall be held on the first and third Tuesdays of the month. In the event the first or third Tuesday is a holiday, an alternate meeting may be held. An additional Adjourned Meeting may be held, if

necessary. Such regular meetings may be canceled by a vote of the majority of Commission members present at a regular or special meeting or when a quorum is not available. Meetings shall be held in the same locale used by the City Council or at City Hall or the Fire Department starting at 6:00 P.M. Adjourned Meetings, Special Meetings, meeting relocation, or revised starting time shall be by a three-fifths vote of the Planning Commission. Notice of such meeting shall be given in accordance with State law.

RULE 9. Emergency or special meetings may be called as provided in Section 54956 of the Government Code of the State of California.

RULE 10. In the absence of a quorum all items on the agenda shall be continued to the next scheduled meeting.

AGENDA

RULE 11. An agenda shall be prepared by the Secretary of the Planning Commission for each meeting of the Planning Commission.

RULE 12. All matters to be considered by the Commission shall be properly filed with the City in compliance with the provisions, standards, and procedures established by adopted City Ordinances. The Secretary shall not accept for presentation to the Commission any matter unless it is properly made on the prescribed forms properly filled out with all data attached.

RULE 13. Any matter that comes before the Commission orally under Public Forum shall not be discussed or acted upon by the Commission unless and until it is heard as a scheduled agenda item at a Regular, Adjourned, or Special meeting of the Commission.

RULE 14. Request for informal or advance decisions concerning potential future developments or plans will not be considered by the Planning Commission.

RULE 15. The regular order of business of the Commission shall be:

1. CALL TO ORDER
2. PLEDGE OF ALLEGIANCE & ROLL CALL
3. MINUTES APPROVAL
4. PUBLIC FORUM
5. COMMUNICATIONS & PETITIONS
6. RECOMMENDED CONSENT CALENDAR
7. CONTINUED ITEMS
8. SIGN PERMIT/ADMINISTRATIVE DETERMINATION
9. PUBLIC HEARINGS - PLANNING COMMISSION ACTION IS FINAL (DR/UP/VAR/LLA/TPM)
10. PUBLIC HEARINGS – PUBLIC HEARINGS/RECOMMENDATIONS TO CITY COUNCIL (TSM/ZOTA/GPA/REZONE)
11. NAPA COUNTY REFERRALS
12. SCHEDULED MATTERS
13. REPORTS BY STAFF AND PLANNING COMMISSION
14. AGENDA FORECAST
15. ADJOURNMENT

RULE 16. The Chairperson may revise the order of the agenda for a particular meeting in order to expedite business for the convenience of the public or for improved continuity.

RULE 17. Commission meetings may remain in session up to, but no later than 10:00 P.M. However, the Commission may, by a unanimous vote, extend the meeting if the Commission deems such extension necessary. Otherwise, the meeting shall be adjourned to another day acceptable to the Commission, or unfinished business may be continued to the next Regular Meeting.

CONDUCT OF PUBLIC HEARINGS

RULE 18. Letters, petitions, or other written material pertaining to any item on the agenda may be filed with the secretary of the Commission prior to the time of the public hearing or may be presented to the Commission at the time of the public hearing. The Commission shall consider such material in deciding any issue before it. All written material shall become part of the Commission's file on the agenda item.

RULE 19. Items submitted after packet distribution: Materials related to any item on the Agenda submitted to the Planning Commission after distribution of the agenda packet are available for inspection in the Secretary of the Commission's office at 1480 Main Street, St. Helena, CA during normal business hours. All such materials will be brought to the meeting and will be available for public inspection at the meeting site. Either City Staff or the Chairperson at the hearing shall give public notice of any such materials. If copies are not available in sufficient quantity for interested parties or members of the public at the hearing, the Chairperson shall take reasonable steps to afford all such persons the opportunity to inspect the materials before the start of the hearing on a scheduled matter. The purpose of the foregoing is to avoid the interruption of testimony with requests for inspection of materials.

RULE 20. Any person desiring to address the Planning Commission may, when recognized by the Chairperson, give his or her name and address. A person appearing in a representative capacity shall provide the name and address of each represented party.

RULE 21. Testimony and argument relative to any item scheduled on the agenda as a Public Hearing shall, unless otherwise ordered by the Chairperson, be presented in the following order and within the time limits specified.

a. The Chairperson shall declare the Public Hearing to be open.
b. Disclosure of Ex Parte Communication*
c. Staff Report, including acknowledgement and/or reading of written testimony.
d. Presentation of the project by applicants, and/or agents/consultants directly associated with the project. (10 minutes)
e. Commission questions to staff and the applicant for purposes of clarification of staff report and proposed project.
f. Public Testimony in support or opposition of the project. (4 minutes per person)
g. Applicant and/or staff response to new information or questions raised by public testimony.
h. Chairperson declares public hearing to be closed.
i. Planning Commission debate, and motion.
j. Roll Call Vote.

Note: At the option of the Chairperson the public or applicant may give further testimony on the question, provided it is directly related to the motion.

* Ex Parte Communication is hereby defined as any additional factual information obtained by commissioners that pertains to an individual decision, including visiting a project site, meeting with a project applicant and/or meeting with interested citizens.

RULE 22. The Chairperson may, in the interest of facilitating the business of the Planning Commission, limit the amount of time that a person may use in addressing the Planning Commission. Opponents and proponents shall be given equal opportunity for presentation. A project applicant should always be given the right, reasonable opportunity and time, to respond fully to evidence and arguments presented after the applicant has made his/her opening presentation.

RULE 23. The applicant or his or her appointed representative may, with the permission of the Planning Commission, withdraw, or request a continuance on any matter pending before the Commission at any time prior to the Commission acting on such matter.

VOTING

RULE 24. A majority of the members of the Commission shall constitute a quorum. Unless otherwise required by federal, state or local regulation, the affirmative vote of a majority of the quorum is necessary to take action. If a majority is unable to be assembled on any motion (including a motion to continue a matter to a specific time) relating to a specific project for which the Commission must make a recommendation to the City Council, the project shall be referred to Council with a divided recommendation which reflects the individual votes of the Commissioners. If a majority is unable to be assembled on any motion (including a motion to continue a matter to a specific time) relating to a specific project for which the Commission has final authority, the matter before the Commission shall be deemed denied and the applicant may appeal such decision in accordance with the applicable rules. A tie vote, or deadlock, constitutes a denial unless the applicant requests a continuance of the item to a subsequent meeting at which a quorum is present, prior to a vote to deny the item.

RULE 25. On matters of procedure or order of business the Chairperson may make a motion and without a second and after calling for objection and hearing none, so order. In the event of objection, the Chairperson shall call for a second and a roll call vote.

MISCELLANEOUS

RULE 26. The Commission shall conduct their duties in keeping with the governing standards as provided by the Planning Commission Standards of Conduct document, maintaining the highest level of professionalism during their tenure serving the residents of the City of St. Helena.

RULE 27. Unless otherwise provided by these Rules, all proceedings before the Commission shall be conducted in accordance with and pursuant to the parliamentary rules of procedure as prescribed in "Rosenbergs's Rules of Order."

RULE 28. Testimony and argument relative to any other item on the agenda shall generally follow the procedure for a Public Hearing as may be modified at the discretion of the Chairperson.

RULE 29. Any rule of these By-Laws may be altered, amended, or repealed by majority vote of the Commission (subject to approval by the City Council), except that such alteration, amendment, or repeal shall not affect any pending matter.

RULE 30. Any rule of these By-Laws may be temporarily suspended by unanimous consent of the Commission.

RULE 31. A Resolution of the Planning Commission may be adopted conditionally and referred to the Secretary of the Commission for drafting in proper form.

RULE 32. Commission members shall decide for themselves whether they have a conflict of interest on any matter before the Commission. Such determination shall be made in accordance with State law and the City of St Helena Protocol for Committee, Commissions and Boards or any amendment thereto. When a member has disqualified himself/herself, he/she shall remove himself/herself from the dais stating their reasons for conflict of interest. The member shall also remove himself/herself from the meeting room, unless they are permitted to remain for a qualified interest as set forth in State law.

RULE 33. Failure to adhere to any of these rules does not result in the invalidation of any decision or action of the Planning Commission.

RULE 34. Any violation of these rules does not result in a cause of action against the City of St. Helena.

RULE 35. Subject to compliance with all established laws and regulations, any violation of these rules shall not impact the outcome of a vote or action on a specific project.

Amended, Approved and Adopted at a Regular Meeting of the Planning Commission on July 17, 2018, by the following roll call vote:

MOTION CARRIED BY THE FOLLOWING ROLL CALL VOTE:

AYES: Commissioners Ponte, Monnette and Hardy
NOES: None
ABSENT: Commissioner Knudsen
ABSTAIN: None

CITY OF ST. HELENA
Planning Commission

Work Plan for Fiscal Year 2026-2027
(*July 1, 2026 – June 30, 2027)*

Accomplishments for Fiscal Year 2025-2026
(*July 1, 2025 – June 30, 2026)*

Commissioners:

Christopher Warner, Chairperson

Sue Frudek, Vice Chairperson

Autumn Anderson

Michelle Covell

Hector Lopez

City of St. Helena
Community Development Department
1088 College Avenue
St. Helena, CA 94574

MISSION STATEMENT

The City of St. Helena Planning Commission is a five-member body of community representatives appointed by the City Council. The goal of the Planning Commission is to guide land use and development decisions that implement the City's General Plan, preserve the unique character of St. Helena, promote housing opportunities, protect community resources, and ensure that growth occurs in a manner that benefits current and future residents.

PLANNING COMMISSION ROLES & RESPONSIBILITIES

Pursuant to Chapter 2.60 of the St. Helena Municipal Code, the Planning Commission serves as the City's advisory body on planning and development matters and is responsible for carrying out duties delegated by the City Council and Municipal Code.

The Planning Commission's primary responsibilities include:

- Reviewing and acting upon development applications as authorized by the Municipal Code.
- Conducting public hearings on land use and development matters.
- Making recommendations to the City Council regarding amendments to the General Plan, Housing Element, Zoning Ordinance, and other planning-related policies.
- Reviewing environmental documents prepared pursuant to the California Environmental Quality Act (CEQA).
- Evaluating development proposals for consistency with adopted City plans, policies, and regulations.
- Providing opportunities for public participation in planning and land use decisions.
- Assisting with implementation of State housing laws and local planning initiatives.

FY 2026-27 WORK PLAN

The FY 2026-27 Planning Commission Work Plan should provide the goals/objectives (no more than five) of the workplan, the activities to accomplish the goals, the priority ranking of each goal, and where feasible the timeline anticipated to accomplish the goal.

1. Schedule, notice, and conduct bi-monthly meetings (usually held on the 1st and 3rd Tuesday of each month) for the purpose of carrying out the roles and responsibilities described within this work plan. **(Ongoing)**
2. Conduct workshops, open to the public for the purpose of studying, evaluating, and facilitating decision-making regarding items scheduled for public hearings, or with relevance to land use. These workshops serve to educate the Planning Commissioners about City planning policies, legal requirements, department procedures, and work programs.
    - The Department has a general list of anticipated land use application projects/ entitlements that may be presented to the Planning Commission during the 2026 - 2027 fiscal year, which includes, but is not limited to, the following projects:
        - Adams Street Castellucci Hotel

- Alilia Hotel Expansion
- 1360 Main Street Redevelopment

- Outside of regularly scheduled public hearing items or projects established by the Community Development Department or by referral by the City Council, educational workshops/study sessions for the 2026 - 2027 fiscal year may include the following topics (dependent on Department workload and capacity) suggested throughout the fiscal year, listed in order of priority:
    - Zoning Ordinance Amendments
        - ADU Ordinance Update
        - Short-Term Rental Ordinance Update
        - Sign Ordinance Update
        - Miscellaneous Code Update 1
        - Inclusionary Housing Requirements
        - Accessory Cultural Art Overlay
    - General Plan Annual Review
    - Brown Act and Robert's Rules of Order **(TBD - As necessary)**
    - California Environmental Quality Act and State Legislative Updates **(TBD - As necessary)**
        - Permit Streamlining Act **(TBD - As necessary)**
- In addition to the workshop items identified above that fall under the direct purview of the Planning Commission and/or are on the Community Development Department workplan, the following informational/educational workshops are of interest to the Planning Commission. These workshops fall under the purview and/or workplans of other City Departments, outside agencies, or are outside of the Planning Commission purview, and may be scheduled, depending on the availability of requisite outside staff or agency participation:
    - Napa County Office of Emergency Services
        - Hazard Mitigation Plan Informational Presentation
    - St. Helena Evacuation Plan
    - Napa County Regional Climate Action & Adaptation Plan (RCAAP)
    - Napa Countywide Transportation Plan & Active Transportation Plan
    - Housing Element and RHNA Implementation
    - Napa Local Agency Formation Commission (LAFCO)
    - Napa Valley Vine Trail Planning and Implementation
    - Our Town St Helena
    - Chamber of Commerce

3. Attend the League of California Cities Planning Commissioners Academy **(Spring 2027)**

FY 2025-26 ACCOMPLISHMENTS

During FY 2025-26, the Planning Commission continued to advance City Council priorities, review development applications, and provide policy guidance on a variety of planning matters.

Recommendations to City Council

The Planning Commission reviewed and provided recommendations on the following policy and legislative matters:

- 1030 Fulton Lane General Plan Amendment
- Vision Triangle Zoning Ordinance Amendment
- Calculation of Floor Area Zoning Ordinance Amendment
- Short-Term Rental Zoning Ordinance Amendment
- Alcohol Sales Zoning Ordinance Amendment
- Spring Grove Tentative Subdivision Map
- Sylvaner Tentative Parcel Map
- Kidd Ranch Tentative Parcel Map
- On-site Storage Zoning Ordinance Amendment

Accepted status reports on the following topics/projects:

Reviewed potential amendments to the Zoning Ordinance intended to improve consistency with State law, clarify development standards, and address implementation issues identified by staff.

- 2023 Zoning Code Update Study Session
- ADU Ordinance Amendment Study Session
- Short-Term Rental Ordinance Study Session

Processed Appeals of Discretionary Land Use Applications for the following projects:

Not applicable. No appeals were filed for Planning Commission review.

Approved Development Projects

The Planning Commission continued to review and take action on discretionary development applications throughout the fiscal year.

Applications reviewed included:

- Major Design Review (2 Projects)
- Demolition (3 Projects)
- Conditional Use Permits/ Amendments (2 Projects)
- Tentative Subdivision Map (3 Projects)
- Major Sign Permit (4 Projects)

Received Informational Training Sessions from the following Agencies:

Not applicable. It is the goal of the Community Development Department to

provide trainings to the Planning Commission on topics of interest every other year, depending on the availability of requisite outside staff or agency participation and Department workload.

Agenda Report to the Planning Commission

Agenda Section: SCHEDULED MATTERS
Department: Community Development Department - Planning Division

DATE:	July 21, 2026
FILE NUMBER:	N/A
SUBJECT:	Nomination and election of a new Planning Commission Chair and Vice Chair and designation of the Commission Secretary.
LOCATION OF PROPERTY:	N/A
APN:	N/A
GENERAL PLAN/ ZONING:	N/A
APPLICANT:	N/A
PROJECT PLANNER:	Natalie Bresee, Assistant Planner
REVIEWED BY:	Leza Mikhail, Community Development Director
CEQA DETERMINATION:	Not a CEQA Project (CEQA Guidelines §15378)
RECOMMENDED ACTION:	Staff recommends that the Planning Commission, nominate and elect a Chair to serve a one-year term, nominate and elect a Vice Chair to serve a one-year term, and designate the Community Development Director as the Commission Secretary in accordance with Rule 1 of the Planning Commission By-Laws.

BACKGROUND:
Rule 1 of the Planning Commission By-Laws provides that the Commission shall elect a Chair and Vice Chair and designate a Commission Secretary at its first regular meeting in July to serve a one-year term. The Commission's current officers were elected in July 2025, and their terms have expired. Accordingly, the Commission is requested to conduct its annual election of officers.

PROJECT DESCRIPTION:
The Planning Commission will nominate and elect a Chair and Vice Chair to serve one-year terms and designate the Community Development Director as the Commission Secretary in accordance with Rule 1 of the Planning Commission By-Laws.

ANALYSIS:
N/A

ISSUES:
N/A

CORRESPONDENCE:
N/A

STAFF RECOMMENDATION:
Staff recommends that the Planning Commission, nominate and elect a Chair to serve a one-year term, nominate and elect a Vice Chair to serve a one-year term, and designate the Community Development Director as the Commission Secretary in accordance with Rule 1 of the Planning Commission By-Laws.

ATTACHMENTS:
1. Adopted PC By Laws

CITY OF ST. HELENA

RESOLUTION NO. 2018-116

Resolution of the Council of the City of St Helena adopting revisions to the City of St Helena Planning Commission By-Laws

RECITALS

The City Council of the City of St. Helena hereby resolves as follows:

A. Whereas, the City of St. Helena Planning Commission voted unanimously to amend its By-Laws at its Regular Meeting on July 17, 2018; and

B. Whereas, the City of St Helena Protocol for Committees, Commissions and Boards requires City Council approval of any modifications to the By-Laws of a Committee, Commission or Board.

RESOLUTION

Therefore, the City Council of the City of St. Helena hereby resolves as follows:

1. This action is not a project under the California Environmental Quality Act; and
2. The City Council authorizes amendments to the City of St Helena Planning Commission By-Laws and are hereby approved, as amended by the Planning Commission on July 17, 2018 (attached).

Approved at a Regular Meeting of the St. Helena City Council on August 28, 2018, by the following vote:

Mayor Galbraith:	Yes
Vice Mayor White:	Yes
Councilmember Koberstein:	Yes
Councilmember Dohring:	Yes
Councilmember Ellsworth:	Yes

APPROVED:

Alan Galbraith, Mayor

ATTEST:

Cindy Tzafopoulos, City Clerk

CITY OF ST. HELENA Incorporated March 24, 1878 Re-incorporated May 14, 1889 STATE OF CALIFORNIA

ST. HELENA PLANNING COMMISSION

BY-LAWS

The following rules shall be applicable to the organization of the St. Helena Planning Commission, to the convening or calling of meetings, and to the transaction of business when the Commission has convened and acts or serves in an official capacity, pursuant to law.

ORGANIZATION AND ELECTION AND DUTES OF OFFICERS

RULE 1. The Commission shall elect a Chairperson and Vice Chairperson and designate a Secretary at the first regular meeting of the Planning Commission in July to serve for a period of one year from the date of their election. However, the Planning Commission, by majority vote, may choose to elect a Chairperson or Vice-Chairperson at a different meeting to address a resignation. In the case of a resignation of the Chair, the Vice-Chair shall become the interim Chair until formal election of a new Chairperson occurs.

RULE 2. The Chairperson of the Planning Commission shall preserve order and decorum and shall decide questions of order. The Vice Chairperson shall preside in the absence of the Chairperson.

RULE 3. The Chairperson of the Planning Commission may second any motion and present and discuss any matter as a member of the Commission without having to step down from the Chair and shall be entitled to vote on all matters before the Planning Commission.

RULE 4. The Secretary shall be a City Employee, normally the Planning Director.

RULE 5. The Secretary shall be responsible for the preparation of the Planning Commission minutes and shall assure that all official actions or decisions by the Commission shall be recorded within the minutes. Consistent with Municipal Code section 2.60.030, the Commission shall keep a public record of its resolutions, transactions, findings and determinations. Those records are kept as minutes that summarize Commission action, in the same manner as City Council minutes.

RULE 6. The City Attorney of the City of St. Helena shall be the legal counsel to the Planning Commission.

RULE 7. The video recordings of each meeting are designated as the official record of the Planning Commission agenda and action and are to be made available on the City of St Helena website.

SCHEDULE OF MEETINGS

RULE 8. The Planning Commission shall hold at least two Regular Meetings per month, which shall be held on the first and third Tuesdays of the month. In the event the first or third Tuesday is a holiday, an alternate meeting may be held. An additional Adjourned Meeting may be held, if

necessary. Such regular meetings may be canceled by a vote of the majority of Commission members present at a regular or special meeting or when a quorum is not available. Meetings shall be held in the same locale used by the City Council or at City Hall or the Fire Department starting at 6:00 P.M. Adjourned Meetings, Special Meetings, meeting relocation, or revised starting time shall be by a three-fifths vote of the Planning Commission. Notice of such meeting shall be given in accordance with State law.

RULE 9. Emergency or special meetings may be called as provided in Section 54956 of the Government Code of the State of California.

RULE 10. In the absence of a quorum all items on the agenda shall be continued to the next scheduled meeting.

AGENDA

RULE 11. An agenda shall be prepared by the Secretary of the Planning Commission for each meeting of the Planning Commission.

RULE 12. All matters to be considered by the Commission shall be properly filed with the City in compliance with the provisions, standards, and procedures established by adopted City Ordinances. The Secretary shall not accept for presentation to the Commission any matter unless it is properly made on the prescribed forms properly filled out with all data attached.

RULE 13. Any matter that comes before the Commission orally under Public Forum shall not be discussed or acted upon by the Commission unless and until it is heard as a scheduled agenda item at a Regular, Adjourned, or Special meeting of the Commission.

RULE 14. Request for informal or advance decisions concerning potential future developments or plans will not be considered by the Planning Commission.

RULE 15. The regular order of business of the Commission shall be:

1. CALL TO ORDER
2. PLEDGE OF ALLEGIANCE & ROLL CALL
3. MINUTES APPROVAL
4. PUBLIC FORUM
5. COMMUNICATIONS & PETITIONS
6. RECOMMENDED CONSENT CALENDAR
7. CONTINUED ITEMS
8. SIGN PERMIT/ADMINISTRATIVE DETERMINATION
9. PUBLIC HEARINGS - PLANNING COMMISSION ACTION IS FINAL (DR/UP/VAR/LLA/TPM)
10. PUBLIC HEARINGS – PUBLIC HEARINGS/RECOMMENDATIONS TO CITY COUNCIL (TSM/ZOTA/GPA/REZONE)
11. NAPA COUNTY REFERRALS
12. SCHEDULED MATTERS
13. REPORTS BY STAFF AND PLANNING COMMISSION
14. AGENDA FORECAST
15. ADJOURNMENT

RULE 16. The Chairperson may revise the order of the agenda for a particular meeting in order to expedite business for the convenience of the public or for improved continuity.

RULE 17. Commission meetings may remain in session up to, but no later than 10:00 P.M. However, the Commission may, by a unanimous vote, extend the meeting if the Commission deems such extension necessary. Otherwise, the meeting shall be adjourned to another day acceptable to the Commission, or unfinished business may be continued to the next Regular Meeting.

CONDUCT OF PUBLIC HEARINGS

RULE 18. Letters, petitions, or other written material pertaining to any item on the agenda may be filed with the secretary of the Commission prior to the time of the public hearing or may be presented to the Commission at the time of the public hearing. The Commission shall consider such material in deciding any issue before it. All written material shall become part of the Commission's file on the agenda item.

RULE 19. Items submitted after packet distribution: Materials related to any item on the Agenda submitted to the Planning Commission after distribution of the agenda packet are available for inspection in the Secretary of the Commission's office at 1480 Main Street, St. Helena, CA during normal business hours. All such materials will be brought to the meeting and will be available for public inspection at the meeting site. Either City Staff or the Chairperson at the hearing shall give public notice of any such materials. If copies are not available in sufficient quantity for interested parties or members of the public at the hearing, the Chairperson shall take reasonable steps to afford all such persons the opportunity to inspect the materials before the start of the hearing on a scheduled matter. The purpose of the foregoing is to avoid the interruption of testimony with requests for inspection of materials.

RULE 20. Any person desiring to address the Planning Commission may, when recognized by the Chairperson, give his or her name and address. A person appearing in a representative capacity shall provide the name and address of each represented party.

RULE 21. Testimony and argument relative to any item scheduled on the agenda as a Public Hearing shall, unless otherwise ordered by the Chairperson, be presented in the following order and within the time limits specified.

a. The Chairperson shall declare the Public Hearing to be open.
b. Disclosure of Ex Parte Communication*
c. Staff Report, including acknowledgement and/or reading of written testimony.
d. Presentation of the project by applicants, and/or agents/consultants directly associated with the project. (10 minutes)
e. Commission questions to staff and the applicant for purposes of clarification of staff report and proposed project.
f. Public Testimony in support or opposition of the project. (4 minutes per person)
g. Applicant and/or staff response to new information or questions raised by public testimony.
h. Chairperson declares public hearing to be closed.
i. Planning Commission debate, and motion.
j. Roll Call Vote.

Note: At the option of the Chairperson the public or applicant may give further testimony on the question, provided it is directly related to the motion.

* Ex Parte Communication is hereby defined as any additional factual information obtained by commissioners that pertains to an individual decision, including visiting a project site, meeting with a project applicant and/or meeting with interested citizens.

RULE 22. The Chairperson may, in the interest of facilitating the business of the Planning Commission, limit the amount of time that a person may use in addressing the Planning Commission. Opponents and proponents shall be given equal opportunity for presentation. A project applicant should always be given the right, reasonable opportunity and time, to respond fully to evidence and arguments presented after the applicant has made his/her opening presentation.

RULE 23. The applicant or his or her appointed representative may, with the permission of the Planning Commission, withdraw, or request a continuance on any matter pending before the Commission at any time prior to the Commission acting on such matter.

VOTING

RULE 24. A majority of the members of the Commission shall constitute a quorum. Unless otherwise required by federal, state or local regulation, the affirmative vote of a majority of the quorum is necessary to take action. If a majority is unable to be assembled on any motion (including a motion to continue a matter to a specific time) relating to a specific project for which the Commission must make a recommendation to the City Council, the project shall be referred to Council with a divided recommendation which reflects the individual votes of the Commissioners. If a majority is unable to be assembled on any motion (including a motion to continue a matter to a specific time) relating to a specific project for which the Commission has final authority, the matter before the Commission shall be deemed denied and the applicant may appeal such decision in accordance with the applicable rules. A tie vote, or deadlock, constitutes a denial unless the applicant requests a continuance of the item to a subsequent meeting at which a quorum is present, prior to a vote to deny the item.

RULE 25. On matters of procedure or order of business the Chairperson may make a motion and without a second and after calling for objection and hearing none, so order. In the event of objection, the Chairperson shall call for a second and a roll call vote.

MISCELLANEOUS

RULE 26. The Commission shall conduct their duties in keeping with the governing standards as provided by the Planning Commission Standards of Conduct document, maintaining the highest level of professionalism during their tenure serving the residents of the City of St. Helena.

RULE 27. Unless otherwise provided by these Rules, all proceedings before the Commission shall be conducted in accordance with and pursuant to the parliamentary rules of procedure as prescribed in "Rosenbergs's Rules of Order."

RULE 28. Testimony and argument relative to any other item on the agenda shall generally follow the procedure for a Public Hearing as may be modified at the discretion of the Chairperson.

RULE 29. Any rule of these By-Laws may be altered, amended, or repealed by majority vote of the Commission (subject to approval by the City Council), except that such alteration, amendment, or repeal shall not affect any pending matter.

RULE 30. Any rule of these By-Laws may be temporarily suspended by unanimous consent of the Commission.

RULE 31. A Resolution of the Planning Commission may be adopted conditionally and referred to the Secretary of the Commission for drafting in proper form.

RULE 32. Commission members shall decide for themselves whether they have a conflict of interest on any matter before the Commission. Such determination shall be made in accordance with State law and the City of St Helena Protocol for Committee, Commissions and Boards or any amendment thereto. When a member has disqualified himself/herself, he/she shall remove himself/herself from the dais stating their reasons for conflict of interest. The member shall also remove himself/herself from the meeting room, unless they are permitted to remain for a qualified interest as set forth in State law.

RULE 33. Failure to adhere to any of these rules does not result in the invalidation of any decision or action of the Planning Commission.

RULE 34. Any violation of these rules does not result in a cause of action against the City of St. Helena.

RULE 35. Subject to compliance with all established laws and regulations, any violation of these rules shall not impact the outcome of a vote or action on a specific project.

Amended, Approved and Adopted at a Regular Meeting of the Planning Commission on July 17, 2018, by the following roll call vote:

MOTION CARRIED BY THE FOLLOWING ROLL CALL VOTE:

AYES: Commissioners Ponte, Monnette and Hardy
NOES: None
ABSENT: Commissioner Knudsen
ABSTAIN: None