



Appendix A Planning Process

TO BE INSERTED AT END OF PROCESS

Appendix B References

ADDITIONAL SOURCES TO BE ADDED

2011 California Geologic Survey Deep Seated Landslide Susceptibility data

2013-2017 American Community Survey

2017 February Winter Storm After Action Report from Sacramento County OES

2017 January Winter Storms After Action Report

2017 Sacramento County Climate Vulnerability Assessment

2017 Sacramento County General Plan

2017 Sacramento County General Plan Land Use Element

2017 Vulnerability Assessment

2018 California State Hazard Mitigation Plan

2020 US Census Bureau Average Household Size

2021 *Critical Infrastructure at Risk – Sea Level Rise Planning Guidance for California’s Coastal Zone* by the California Coastal Commission

2021 Sacramento County Hazard Mitigation Plan

2021-2029 Sacramento County Housing Element

2023 California State Hazard Mitigation Plan

2023 State of California Hazard Mitigation Plan

2024 California Climate Adaptation Study

2024 review from UC Davis Health

2024 Sacramento County Climate Action Plan

2024 Sacramento County Flood Insurance Study

2025 Sacramento County Parcel/Assessor Data

2026 American, Bear, and Cosumnes Watersheds Resilience Plan

Administration for Community Living

Agricultural Commissioner

American River Flood Control District

American Society of Civil Engineers

Bureau of Land Management

CA DWR Division of Safety of Dams

CA DWR Pixel website

CA DWR SGMA Data Viewer

CAL FIRE

CAL FIRE (FHSZ SRA 2024, FHSZ FRA 2007)

CAL FIRE (LRA 2025)

CAL FIRE eGIS WUI21_1 Dataset

Cal OES

Cal-Adapt

Cal-Adapt – Precipitation: Decadal Averages Map

Cal-Adapt 2017/2023

Cal-Adapt Sea Level Rise, UC Berkeley, San Francisco Bay

Cal-Adapt SLR GIS

CalAtlas

California Adaptation Planning Guide

California Climate Adaptation Strategy (CAS) – 2014

California Coastal Inundation Depth Layer Mosaics

California Department of Conservation

California Department of Developmental Services

California Department of Finance

California Department of Finance

California Department of Fish and Game's Natural Diversity Database

California Department of Fish and Wildlife Service

California Department of Fish and Wildlife Service

California Department of Housing and Community Development

California Department of Parks and Recreation Office of Historic Preservation

California Department of Water Resources

California Department of Water Resources (CA DWR) Special Populations and Disadvantaged Community Mapping

California Department of Water Resources Statewide Airborne Electromagnetic Survey

California Division of Mines and Geology

California Energy Commission

California Environmental Protection Agency

California Environmental Protection Agency (Cal EPA) Disadvantaged Communities

California Environmental Quality Act (CEQA)

California Geological Survey

California Independent System Operator

California Natural Diversity Database

California Natural Resource Agency

California Natural Resources Report

California Ocean Protection Council

California Office of Emergency Services

California's Adaptation Planning Guide: Understanding Regional Characteristics

California's Fourth Climate Change Assessment

CDFW Invasive Species Program

Center for Disease Control (CDC) Social Vulnerability Index

Center for Western Weather and Water Extremes

Central Valley Flood Protection Board

CGS Liquefaction Zones 2015

Climate Change and Health Profile Report –Sacramento County

Contract Counties

County Emergency Operations Plan

Delta Risk Management Strategy

Department of Boating and Waterways

DSOD/Cal OES

DSOD/NID Dam Status 1/25

FEMA

FEMA CIS 2026

FEMA Community Disaster Resilience Zones

FEMA DFIRM 02/22/2024

FEMA Disaster Declaration Database

FEMA National Risk Index

FEMA Region IX (PIVOT database)

FEMA: Building Performance Assessment: Oklahoma and Kansas Tornadoes

FEMA’s Community Information System

FEMA’s National Risk Index, 2024

FirstStreet.org

FM Global Insurance company

Geological Information Services

Hazard Mitigation Planning Committee

Hazus-MH 6.1

HMPC input

Levee Failures in the Sacramento-San Joaquin River Delta. URS 2011

Levees in History: The Levee Challenge. Dr. Gerald E. Galloway, Jr., P.E., Ph.D., Water Policy Collaborative, University of Maryland, Visiting Scholar

Multi-Hazard Identification and Risk Assessment

NASA.gov

National Aeronautics and Space Administration

National Center for Atmospheric Research

National Climate Assessment

National Climatic Data Center Storm Events Database

National Drought Mitigation Center

National Environmental Policy Act (NEPA)

National Flood Insurance Program

National Integrated Drought Information System

National Inventory of Dams

National Levee Database

National Oceanic and Atmospheric Administration

National Oceanic and Atmospheric Administration Storm Prediction Center

National Oceanic and Atmospheric Administration's National Climatic Data Center

National Park Service

National Performance of Dams Program

National Weather Service

National Weather Service XMAC site

NFIP's Community Rating System

NOAA National Centers for Environmental Information (NCEI) Storm Events Database

NOAA Storm Prediction Center

Public Policy Institute

Sacramento Air Quality Management District

Sacramento Bee

Sacramento County (Amended) Safety Element Background Report

Sacramento County 2022 General Plan Background Report

Sacramento County 2025 Economic Development Strategic Plan

Sacramento County Agricultural Commissioner

Sacramento County Agricultural Commissioner

Sacramento County Building Department and Planning Department

Sacramento County Climate Action Plan: Communitywide Greenhouse Gas Reduction and Climate Change Adaptation

Sacramento County Department of Water Resources

Sacramento County Economic Development Strategic Plan

Sacramento County General Plan Economic Development Element

Sacramento County General Plan Land Use Element

Sacramento County General Plan Open Space Element Background Report

Sacramento County General Plan Safety Element Background Report

Sacramento County GIS

Sacramento County Office of Emergency Services

Sacramento County Planning Team

Sacramento County Public Works

Sacramento Metro Fire District CWPP

Sacramento-San Joaquin Delta and California Coastal Inundation Depth Layer Mosaics 2016

South Sacramento Habitat Conservation Plan

State Department of Water Resource's Delta Atlas

State of California Department of Conservation

State of California Sea Level Rise Guidance 2024 Science and Policy Update

Susceptibility to Deep-Seated Landslides map – CSG Map Sheet 58

The Board of Supervisors Report

The Watershed Management Plan

U.S Department of Agriculture

U.S. Department of Agriculture Secretarial Disaster Declarations

U.S. Drought Monitor

U.S. Fish and Wildlife Service National Wetlands Inventory maps

Uniform California Earthquake Rupture Forecast model

United Nations Intergovernmental Panel on Climate Change Sixth Assessment Synthesis Report

United States Geological Survey

United States Geological Survey Open File Report 2015-3009

University of California, Berkeley's Department of Environmental Science, Policy, and Management

US Army Corp of Engineers

US Bureau of Reclamation

US Census Bureau

US Fish and Wildlife Service October 2024 National Wetlands Inventory

US Forest Service

USDA Forest Service Region 5

USGS Earthquake Intensity Zonation and Quaternary Deposits, Miscellaneous Field Studies Map 9093, 1977

USGS Emergency Assessment of Post-Fire Debris Flow Hazards

USGS National Earthquake Information Center database

Vaisala National Lightning Detection Network

Western Regional Climate Center

Wildfire Safety Operations Center

“Wildland fire management and air quality in the southern Sierra Nevada: Using the Lion Fire as a case study with a multi-year perspective on PM2.5 impacts and fire policy” by D. Schweizer and R. Cisneros

Appendix C Mitigation Strategy

Sacramento County
Multi-Jurisdictional
2026 Local Hazard Mitigation Plan (LHMP) Update
HMPC Meetings #3 & #4 – Mitigation Strategy
June 10 & 11, 2026

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**SACRAMENTO COUNTY
MULTI-JURISDICTIONAL
2026 LOCAL HAZARD MITIGATION PLAN (LHMP) UPDATE
Hazard Mitigation Planning Committee (HMPC)
Meetings #3 and #4 – Mitigation Strategy**

**Wednesday June 10, 2026 (1:00 - 4:00 pm) | EMD Building, Rancho Cordova
Thursday June 11, 2026 (9:00 am - 12:00 pm) | Laguna Room at District 56, Elk Grove**

HMPC Meeting #3:

1. Introductions
2. LHMP Project Status and Next Steps/Timeline
3. Risk Assessment Status/Discussion
4. Priority Hazards Review
5. Develop Plan Goals and Objectives
6. Introduction to HMPC Meeting #4: Mitigation Alternatives/Actions/Projects

HMPC Meeting #4:

7. Introductions
8. Review Mitigation Categories and Selection Criteria
9. Brainstorming of Mitigation Alternatives/Actions/Projects by Hazard
10. Prioritization of Mitigation Actions/Projects
11. Next Steps
12. Questions?

Mitigation Strategy Meetings
June 10 & 11, 2026
Day 1

Status of the 2026 Sacramento County LHMP Update Project/Next Steps

FEMA's 4-Phase-10 Step DMA/CRS Planning Process

Phase I: Organize Resources

- 1) Get organized
- 2) Plan for public involvement
- 3) Coordinate with other departments and agencies

Phase II: Risk Assessment

- 4) Identify the hazard(s)
 - 5) Assess the risks
- Capability Assessment

Phase III: Mitigation Strategy

- 6) Set planning goals
- 7) Review mitigation alternatives
- 8) Draft an action plan

Phase IV: Adoption and Implementation

- 9) Adopt the plan
- 10) Implement the plan, evaluate its worth, and revise as needed

LHMP Project Schedule/Key Dates

2026 LHMP Update Meetings

- **June 10 (Wednesday):** HMPC Meeting #3 (Mitigation Strategy: Goals Development) (1:00 – 4:00 pm)
- **June 11 (Thursday):** HMPC Meeting #4 (Mitigation Strategy: Actions and Projects) (9:00 am – 12:00 pm)
- **November 4 (Wednesday):** Final Public Meeting #3 (5:30 – 7:00 pm)
- **November 5 (Thursday):** Final HMPC Meeting #5 (9:00 am – 12:00 pm)

Mitigation Strategy Meetings - Follow up

- **June 26 (Friday):** Mitigation Strategy (goals/actions) follow up processed and sent to Sacramento/HMPC
- **July 24 (Friday):** Mitigation Action (Project) Worksheets due to Foster Morrison

LHMP Document Drafts

- **August 14 (Friday):** HMPC (First) Draft LHMP to Sacramento/HMPC
- **September 18 (Friday):** Sacramento/HMPC comments due on Draft Plan
- **October 9 (Friday):** Comments incorporated into Public Review (Second) Draft to Sacramento
- **October 16 (Friday):** Public Review Draft on Sacramento website
- **November 20 (Friday):** all final Sacramento, HMPC, and Public input to Foster Morrison
- **December 11-18:** Public and final comments incorporated and LHMP ready for submittal to Cal OES
- **December 2026:** Cal OES Submittal

2026 Sacramento Hazard Identification & Profiles

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/Severity	Significance	Climate Change Influence
Aquatic Nuisance Species (plant/animal)	Limited	Occasional	Limited	Medium	Low
Climate Change	Extensive	Highly Likely	Limited	Medium	–
Dam Failure	Significant	Occasional	Catastrophic	High	Medium
Drought & Water Shortage (w/tree mortality)	Extensive	Likely	Critical	High	High
Earthquake (w/subhazards)	Extensive	Occasional	Catastrophic	Medium	Low
Flood: 1%/0.5%/0.2% annual chance	Significant	Occasional/Unlikely	Critical	High	Medium
Flood: Localized Stormwater	Significant	Highly Likely	Limited	Medium	Medium
Landslides, Mudslides, and Debris Flow	Limited	Occasional	Negligible	Medium?	Medium
Levee Failure	Significant	Occasional	Catastrophic	High	Medium
Sea Level Rise	Limited	Likely	Negligible	Medium	High
Severe Weather: Extreme Cold and Freeze	Extensive	Highly Likely	Limited	Medium	Medium
Severe Weather: Extreme Heat	Extensive	Highly Likely	Critical	High	High
Severe Weather: Heavy Rains and Storms (Hail, Lightning, Wind)	Extensive	Highly Likely	Limited to Critical	Medium	Medium
Severe Weather: High Winds and Tornadoes	Extensive	Highly Likely	Limited to Critical	Medium	Low
Subsidence	Limited	Likely	Limited	Medium	Medium
Wildfire (with smoke and air quality)	Extensive	Highly Likely	Catastrophic	High	High
Geographic Extent Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area Likelihood of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years. Magnitude/Severity Catastrophic: More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical: 25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited: 0-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible: Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact Climate Change Influence Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact					

Risk Assessment Methodology

Calculating Likelihood of Future Occurrence

The frequency of past events is used in this section to gauge the likelihood of future occurrences. Based on historical data, the likelihood of future occurrence is categorized into one of the following classifications:

- **Highly Likely:** Near 100% chance of occurrence in next year, or happens every year.
- **Likely:** Between 10 and 90% chance of occurrence in next year, or has a recurrence interval of 10 years or less.
- **Occasional:** Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.
- **Unlikely:** Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.

Calculating Vulnerability

Vulnerability is measured in general, qualitative terms, and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential:

- **Extremely Low:** The occurrence and potential cost of damage to life and property is very minimal to non-existent.
- **Low:** Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium:** Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High:** Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have already occurred in the past.
- **Extremely High:** Very widespread and catastrophic impact.

Defining Significance (Priority) of a Hazard

Defining the significance or priority of a hazard to a community is based on a subjective analysis of several factors. This analysis is used to focus and prioritize hazards and associated mitigation measures for the plan. These factors include the following:

- **Past Occurrences:** Frequency, extent, and magnitude of historic hazard events.
- **Likelihood of Future Occurrences:** Based on past hazard events.
- **Ability to Reduce Losses through Implementation of Mitigation Measures:** This considers both the ability to mitigate the risk of future occurrences as well as the ability to mitigate the vulnerability of a community to a given hazard event.

Risk Assessment Summary: Sacramento 2026 LHMP

Sacramento County Disasters since 2021 LHMP

- 2025 Wildfires and Straight-line Winds (both a federal and state disaster declaration)
- 2024 Severe Winter Storms, Tornadoes, Flooding, Landslides, Mudslides (both a federal and state disaster declaration)
- 2024 State of Emergency for Atmospheric River Storms (state disaster declaration)
- 2023 Tropical Storm Hilary (both a federal and state disaster declaration)
- 2023 Severe Winter Storms, Straight-line Winds, Flooding, Landslides, Mudslides (federal disaster declaration)
- 2023 State of Emergency for Atmospheric River Storms (state disaster declaration)
- 2023 State of Emergency for Atmospheric River Storms (state disaster declaration)
- 2023 Severe Winter Storms, Flooding, Mudslides (federal disaster declaration)
- 2023 Severe Winter Storms, Flooding, Landslides, Mudslides (federal disaster declaration)
- 2022 State of Emergency for Atmospheric River Storms (state disaster declaration)
- 2021 Drought (state disaster declaration)
- 2020 Wildfires (both a federal and state disaster declaration)
- 2020 Wildfires (both a federal and state disaster declaration)

Aquatic Nuisance Species: (Plant/Animal)

- This hazard focuses on “aquatic nuisance species” (both plants and animals) that can compound impacts associated with other natural hazards (such as flooding), cause impacts to human health, cause direct damage to infrastructure, and cause significant economic and other impacts to the Planning Area.
- The Aquatic Nuisance Species Hazard was included primarily as a result of the Golden Mussel, an invasive, non-native freshwater bivalve, discovered (10/2024) in the Port of Stockton by Cal DWR.
- This discovery is the first known occurrence of golden mussels in North America. The species poses a significant immediate threat to the ecological health of the Delta and all waters of the state, water conveyance systems, infrastructure and water quality.
- According to California Fish and Wildlife, aquatic nuisance species currently occurring in Sacramento County include: Water Hyacinth, Brazilian Waterweed, South American Spongeplant, Uruguay Water Primrose, Alligator Weed, Nutria, Golden Mussel, Curly Leaf Pondweed. Those at risk of occurring or spread in the County include: Quagga mussel, New Zealand Mudsnail, and Invasive Aquarium Fish.
- There have been no FEMA or state disaster declarations associated specifically with aquatic nuisance species. The NCDC does not track aquatic nuisance species incidents in the County. USDA declarations do not include Ag issues beyond severe weather events.
- CAN COUNTY CONFIRM THE AQUATIC NUISANCE SPECIES OF GREATEST CONCERN TO THE PLANNING AREA? PROVIDE DAMAGE INFORMATION ON PAST OCCURRENCES OR SPECIFIC AREAS OF CONCERN/ISSUES?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard

Climate Change

- The 2023 State of California Hazard Mitigation Plan stated that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the state’s infrastructure, water supplies, and natural

resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and both snowmelt and rainwater running off sooner in the year. Climate Change has the potential to alter the nature and frequency of most hazards.

- Each year, it is getting hotter. Snow levels seem to be higher (or larger), and the recent atmospheric river winter rains are more intense. Drought conditions continue to be cyclical, depending on the year.
- The combined effects of the drought, decline in forest health, temperature changes, and wildfires in and around neighboring counties, much contributed to climate change, have also led to poor air quality.
- The 2024 Sacramento County Climate Adaptation Plan identifies flooding, extreme heat, and sea level rise as having High potential impacts and wildfire and drought as having Medium potential impacts. Adaptive capacity for all but flood is considered of Medium potential; flood's adaptive capacity is considered of Low/Medium potential.
- ANY ADDITIONAL INFORMATION ON CLIMATE CHANGE IMPACTS OR SPECIFIC CONCERNS/ISSUES?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard

Dam Failure

- According to data provided by Cal DWR, DSOD data, there are 22 dams in Sacramento County constructed for flood control, storage, electrical generation, and recreational purposes. Of these, 0 are rated as extremely high, 7 rated as High Hazard, 5 as Significant Hazard, and 10 as Low Hazard.
- In addition to those dams located within Sacramento County, there are 37 other dams (19 Extremely High, 12 High Hazard, 6 Significant Hazard, and 0 Low Hazard) outside the County (located in Amador, Butte, Calaveras, El Dorado, Fresno, Madera, Nevada, Placer, San Joaquin, Shasta, Tuolumne, and Yuba Counties) with the potential to affect people and property in Sacramento County.
- 19 Extremely High and 16 High Hazard dams have inundations in Sacramento County. 3 additional High Hazard dams did not have an available inundation layer, so their impacts to Sacramento County are unknown. An inundation analysis was not performed on the Significant or Low Hazard dams. (This analysis currently excludes Folsom Dam)
- The most significant dams of concern include the Extremely High and High Hazard dams where loss of life is possible. The failure of a dam may affect the dam site and downstream areas.
- A search of the National Performance of Dams database shows two dam related incidents for Sacramento County (1995 and 1997) related to the Folsom Dam. However, these incidents were limited in scope and since those events, significant improvements to the Folsom Dam system have been made. Also to note, in February 2017, the Oroville spillway incident occurred. There was no disaster declaration in Sacramento for the Oroville event.
- WHAT DAMS ARE OF GREATEST CONCERN TO THE SACRAMENTO PLANNING AREA?
- Likelihood of Future Occurrence: Occasional
- Vulnerability: Extremely High
- Priority Hazard

Drought and Water Shortage (w/tree mortality)

- Sacramento County has been in and out of drought since 2014. Historical drought data for the Sacramento County Planning Area indicate there have been 5 significant droughts in the last 90 years.

- 3 state (1976, 2014, 2021) disaster declarations and 1 federal declaration (1977) for Sacramento County since 1950. USDA declarations from 2012-2025 include 26 Drought; 3 of these occurring since 2021. There have been 83 NCDC drought events in Sacramento County, related to the 2014-present drought.
- Sacramento County Planning Area's water supply is generally reliable and diverse, supported by a mix of local surface water, groundwater, and regional imports. The County benefits from its location in the Sacramento Valley, with abundant access to the Sacramento River and its tributaries, making it less vulnerable to severe shortages compared to drier parts of California.
- It was noted that in terms of overall water supply reliability, that reliability is high in normal/wet years. In the 2025 Annual Water Supply and Demand Assessment (statewide), suppliers in the Sacramento River hydrologic region (including Sacramento County) reported no projected shortages and sufficient supplies. Many urban suppliers showed surpluses (e.g., Sacramento City at 173%, Sacramento Suburban Water District at 215%).
- Tree mortality in Sacramento County is more localized to: Urban street/yard trees (affected by heat, drought stress, poor soil, irrigation issues, and pests), riparian/oak woodlands (e.g., blue oaks, valley oaks stressed by drought and development), and emerging pest issues like the Mediterranean Oak Borer which expanded in Sacramento County in 2023–2024, killing valley, blue, and Oregon white oaks in localized spots (e.g., Citrus Heights, Fair Oaks, City of Sacramento).
- Key concerns related to drought and water shortage, include the influence of water rights on water supply and usage, especially during years with a reduction in available water; this affects agricultural/irrigation and potable uses differently. Other issues include the drawdown of the groundwater table during repeated dry years. This can lead to the need to deepen wells increasing the costs of pumping and can also lead to subsidence. Other concerns include an increase in tree mortality and wildfire conditions leading to an increased risk of catastrophic wildfires. Additional conservation measures and restrictions in the Planning Area are also an ongoing concern during years of drought.
- WHAT HAS BEEN IMPACTED THE MOST? WAS WATER SUPPLY AFFECTED DURING THE RECENT DROUGHT, EVEN IN THE SHORT TERM? WHAT ARE THE MOST SIGNIFICANT CONCERNS MOVING FORWARD?
- Likelihood of Future Occurrence: Drought - Likely/Water supply - Occasional
- Vulnerability: High
- Priority Hazard

Earthquake (w/subhazards)

- Geological data indicates that no major active faults transect the County. No Alquist-Priolo earthquake fault zones are located in the County. Numerous faults are located in neighboring counties. Ground shaking may be experienced in Sacramento County from earthquakes associated with faults located outside of the County. Recent seismic studies of the Delta area show areas of significant seismic risk, that could impact area levees.
- Areas prone to liquefaction in the County were recently mapped in 2025 by the CGS. CGS mapping identifies portions of the City of Sacramento downtown area inside a liquefaction zone. Other studies have previously identified two primary areas prone to liquefaction in the Planning Area: Downtown City of Sacramento and areas within the Delta with saturated, loose sandy soils and areas of fill.
- The USGS National Seismic Hazard Maps provide acceleration and probabilities for various time periods. Data shows expected severity of earthquakes in the region is mostly low to slightly moderate.
- There have been two disaster declarations in Sacramento County from earthquake: 1989 Loma Prieta (both state and federal declarations were issued) and 2014 Napa earthquakes.

- There have been several felt occurrences in the County from regional earthquakes, with limited damages reported in the County. USGS identified 59, 5.0 or greater earthquakes that have occurred within 90 miles of City of Sacramento.
- Deterministic Hazus runs were conducted for the following: A Calaveras Fault 6.86M event; Concord and Green Valley Fault 6.80M event; and a Hayward + Rogers Creek Fault 7.58 event, and a San Andreas Fault 8.04M event.
- WHAT ARE THE MOST SIGNIFICANT ISSUES/CONCERNS RELATED TO EARTHQUAKE?
- Likelihood of Future Occurrence: Unlikely – large, damaging earthquake; Occasional – minor earthquake
- Vulnerability: Extremely High
- Priority Hazard

Flood Hazards

1%/0.5%/0.2% Annual Chance

- Historically, portions of Sacramento County have always been at risk to flooding because of its annual percentage of rainfall, the number of watercourses, and the miles of levees that traverse the County.
- New 2024 DFIRMs are being utilized for this 2026 LHMP Update.
- Flood zones in Sacramento County are quite extensive. High water levels are a common occurrence in winter and spring months due to increased flow from stormwater runoff and snowmelt. Several areas of the County are subject to flooding by the overtopping of rivers and creeks, levee failures, and the failure of urban drainage systems that can't accommodate large volumes during severe rainstorms.
- Flooding is the most significant natural hazard that Sacramento County faces. Sacramento is not just at high risk of flooding, but is at high risk of catastrophic flooding.
- However, ongoing improvements made to local dams, levee systems, and other areas prone to flooding, continue to reduce the risk and vulnerability of the Planning Area to future flood events.
- 26 state and 18 federal declarations from 1950-present were for heavy rains and flooding. Since 2021, includes six state and four federal disaster declarations. The NCDC lists 151 flood events since 1993.
- REVIEW RISK ASSESSMENT AND ADD INFORMATION ON MAJOR FLOOD EVENTS. NEED SUMMARY OF IMPACTS FROM THE 2022, 2023, and 2024 FLOOD EVENTS (THAT RESULTED IN DISASTER DECLARATIONS).
- Likelihood of Future Occurrence: 1%-Occasional; 0.5% – Unlikely; 0.2%-Unlikely
- Vulnerability: High
- Priority Hazard

Localized/Stormwater flooding

- Significant localized flood history in the County Planning Area– occurs annually
- Recent atmospheric river events occurring annually since 2021 have led to more significant flooding throughout the County, especially in areas of undersized or outdated drainage systems.
- WHAT ARE THE MOST SIGNIFICANT ISSUES AND CONCERNS RELATED TO LOCALIZED FLOODING? ADDITIONAL ISSUES WITH RECENT ATMOSPHERIC RIVER EVENTS?
- WHERE ARE THE PROBLEM AREAS? PICTURES/DESCRIPTIONS ON FLOOD EVENTS?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard

Landslides, Mudslides, and Debris Flows

- There have been no direct disaster declarations associated with landslides in Sacramento County. However, there have been 1 state and 4 federal disaster declarations, all occurring since 2021, related to flood that documented landslide issues. The NCDC contains no records of landslides in the County.
- The 2021 LHMP listed no recent landslide events. Research indicated that there were scattered debris flows and mudslides in October 2021 and December 2022/January 2023 after atmospheric river storms.
- CGS mapping indicates that the County Planning Area overall is at limited risk to landslide due to its relatively flat topography. Mapping also shows some areas within the northeastern portion of the Planning Area more prone to high and very high susceptibility for landslides.
- The 2021 LHMP identified a narrow strip along the eastern boundary of the Placer County line to the Cosumnes River as a potential landslide area. However, future slides on these slopes are expected to be minor in scope and do not pose a large scale threat to life or property. The 2021 LHMP also identified the American River Bluffs downstream from Folsom and in Fair Oaks and Carmichael, while a potential landslide area, are considered stable and not subject to fracture or landslides. STILL TRUE?
- CAN ANYONE PROVIDE ADDITIONAL INFORMATION ON PAST OR ACTIVE LANDSLIDE AREAS SINCE 2021? ANY ACTIVE LANDSLIDES TO BE MITIGATED? PHOTOS?
- Likelihood of Future Occurrence: Occasional
- Vulnerability: Medium
- Priority Hazard?

Levee Failure

- Over 500 miles of levees throughout the County. Many are accredited, providing protection against the 1% annual chance flood; certification is in process for others; and many miles of levee remain unaccredited.
- There have been two federal disaster declarations in Sacramento County directly related to levee failure: 1980 Delta Levee Break and 1972 Andrus Island Levee Break. In addition, as part of a 2023 federal disaster declaration for flood (DR-4683), a privately owned levee system along the Consumnes River (near Wilton and Sloughhouse in eastern/southern Sacramento County) experienced multiple breaches/ruptures. Reports indicate two to three major breaks along a roughly 31–34 mile stretch of levee, with at least 11 trouble spots identified.
- Although there have been numerous documented levee breaks in the Delta Area since 1900, most were prior to 1990 and do not reflect future failure potential due to extensive levee improvements in the area.
- Various levee system improvements (including certification projects) are in process throughout the Planning Area that will continue to reduce the overall risk and vulnerability to this hazard.
- WHAT ARE THE MOST SIGNIFICANT AREAS/CONCERNS/ISSUES WITH THESE LEVEES MOVING FORWARD?
- Likelihood of Future Occurrence: Occasional
- Vulnerability: Extremely High
- Priority Hazard

Severe Weather Hazards

Extreme Cold and Freeze

- Annual occurrences of cold temperatures and freeze events
- In Sacramento County monthly average minimum temperatures from November through April range from the upper-30s to upper-50s. The lowest recorded daily extreme was 17°F on December 11, 1932. In a typical year, minimum temperatures fall below 32°F on 8.3 days with no days falling below 0°F.
- No state or federal disaster declaration related to extreme cold or freeze. NCDC identified 16 extreme cold or freeze events since 1993.
- 3 USDA Disaster Declarations from freeze since 2012 (all occurring in 2022), with 1 additional event for heavy rains, high winds and hail that included cold weather in 2016.
- The 2021 LHMP noted specific years with extreme cold events, some of which resulted in deaths: 2018, 2019, and 2021. WHAT ABOUT SINCE 2021?
- Primary concerns related to extreme cold and freeze include impacts to vulnerable populations, especially those without shelter and the young, old, and those with medical issues. Pets and livestock are also at risk to extreme freeze and cold. Crop production can also be adversely impacted. OTHER?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard

Extreme Heat

- Annual occurrences of hot temperatures – it gets HOT every summer!
- In Sacramento County, monthly average maximum temperatures in the warmest months (May through October) range from the upper-70s to the low 90s. The highest recorded daily extreme was 114°F on July 17, 1925. In a typical year, maximum temperatures exceed 90°F on 65.4 days.
- There have been no FEMA or Cal OES disasters related to extreme heat and no USDA disaster declarations for extreme heat. The NCDC recorded 68 extreme heat events since 1993.
- Extreme heat can damage crops. This can be substantial if extreme heat occurs during periods of plant susceptibility to heat. Extreme heat contributes to PSPSs and increases threat of wildfire in the Planning Area. Heat domes have settled over the County in the past, triggering the opening of cooling centers. Vulnerable populations including those without shelter, outdoor workers, the young, old, and those with medical conditions are all at a heightened risk to extreme heat. Extreme heat also contributes to unhealthy air quality.
- PLEASE PROVIDE DETAILS ON NOTABLE EXTREME HEAT EVENTS AND HOW THE PLANNING AREA WAS AFFECTED.
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard

Heavy rains and storms (Hail, Lightning)

- Significant County history: annual occurrences.
- Average annual precipitation in Sacramento County is 18.15 inches per year. The highest recorded annual precipitation is 37.62 inches in 1983; the highest recorded precipitation for a 24-hour period is 5.28 inches on April 20, 1962. The lowest recorded annual precipitation was 11.76 inches in 1976.

- There have been 26 state and 18 federal declarations since 1950 for flooding, including heavy rains and storms. This includes 6 state and 4 federal events since 2021. USDA Declarations included 4 events for heavy rains and storms since 2012. The NCDC data recorded 9 hail, 29 heavy rain, 2 winter storm, and 1 lightning events for Sacramento County since 1950.
- Severe storms/heavy rains are the primary cause of most major flooding
- Atmospheric River events have been significant since the 2021 LHMP resulting in more frequent and intense storms, increasing the potential for catastrophic flooding. Power outages are more common during large storm events. Severe storms can lead to an increase in tree fall events.
- PLEASE PROVIDE DETAILS ON NOTABLE HEAVY RAIN AND STORM EVENTS AND HOW THE PLANNING AREA WAS AFFECTED.
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard

High Winds and Tornadoes

- Annual occurrences of high winds; tornadoes are more rare.
- No state or federal disaster declarations for high winds or tornadoes. In 2016, there were 2 USDA declarations with high winds as a component. The NCDC data recorded 107 high wind, 7 funnel cloud, and 15 tornado incidents for Sacramento County since 1950.
- Significant concerns are associated with high winds contributing to fire weather and red flag days, the fueling and spreading of wildfires and the triggering of PSPS events. Tree fall events also increase.
- CAN THE HMPC PROVIDE INFORMATION ON PAST HIGH WINDS AND TORNADO EVENTS AND DAMAGES? WHAT ARE THE PRIMARY CONCERNS?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard

Sea Level Rise

- Sea Level Rise (SLR), a new hazard for the 2026 LHMP, is increasingly becoming an issue of concern to the Sacramento County Planning Area.
- No state or federal disaster declarations related to SLR. NCDC does not track sea level rise issues.
- SLR poses significant risks to the County Planning Area. SLR escalates flood hazards, specifically through increased pressure on delta levee systems and higher tidal levels pushing inland. It can also accelerate the deterioration of levees protecting low-lying areas, increasing the threat of catastrophic flooding, particularly when combined with high-flow river events. Salt water intrusion is also a concern; rising sea levels can force salt water further into the Delta, contaminating freshwater supplies and impacting agricultural irrigation. As SLR continues, land areas will continue to be impacted, especially low lying areas already situated at or below sea level. OTHER CONCERNS?
- ANY NOTABLE AREAS OF CONCERN/ ISSUES TO NOTE, BOTH INSIDE AND OUTSIDE OF THE DELTA AREA?
- Likelihood of Future Occurrence: Likely
- Vulnerability: Medium
- Priority Hazard

Subsidence

- Sacramento County is generally affected by five types of subsidence: compaction of unconsolidated soils by earthquake shaking (liquefaction), compaction by heavy structures, the erosion of peat soils, peat oxidation, and fluid withdrawal.
- No state or federal disaster declarations related to Subsidence. NCDC does not track subsidence issues.
- The Delta in the southeast portion of the County is highly at risk to subsidence. The Delta, blanketed by peat and peaty alluvium deposits, is a primary area of concern prone to subsidence; areas with peat thickness over 10 feet have a greater potential for continued subsidence. In the Delta, subsidence can affect the islands as well as the levees.
- While subsidence of Delta lands has been reported to be a major risk to Delta levees, subsidence is limited and non-existent in some areas under and adjacent to the levees as those areas have consolidated over the last fifty years and oxidation of the peat foundations is more limited due to a reduction in farming activities in these areas.
- OTHER NOTABLE AREAS/ISSUES OF CONCERN, BOTH INSIDE AND OUTSIDE OF THE DELTA AREA?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard

Wildfire

- Wildfires occur on an annual basis in the Sacramento County Planning Area.
- Any ignition has the potential to become an out of control wildfire.
- 4 state (1973 2020 (twice), 2024) and 3 federal (2020 (twice) and 2025) disaster declarations for wildfire since 1950; 13 NCDC wildfire and 2 smoke events since 1993. Numerous CAL FIRE events have occurred in and around the County, with areas to the west, north and south primarily affected.
- Data also shows that PSPS events occurred during extreme fire weather: PG&E noted 3 events in 2019 and no events since the 2021 LHMP.
- CAL FIRE has new Fire Hazard Severity Zone mapping (SRA in 2024; LRA in 2025), which mapped Sacramento County into the FHSZs for the first time.
- Primary areas of concern for wildfire include: large concentrations of highly flammable brush in open space areas; the river bottom areas, especially located along the American River Parkway; eucalyptus groves where increased fire risk occurs; and fires coming into the County from Placer County, in the northern portion of the Planning Area. OTHERS?
- An increase in fire weather and red flag days continue to be a concern. Smoke and poor air quality, both from fires located within and outside the County, have been a significant issue in recent years.
- WHAT TYPE OF DAMAGES HAVE BEEN EXPERIENCED FROM WILDFIRE SINCE THE 2021 LHMP? WHAT ARE THE MOST SIGNIFICANT CONCERNS WITH THIS HAZARD? WHAT ABOUT SMOKE AND AIR QUALITY IMPACTS?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: High
- Priority Hazard

Sacramento County 2026 LHMP Update Priority Hazards

SHOULD ANY HAZARDS BE MOVED TO LOW PRIORITY – ARE THERE MITIGATION ACTIONS FOR EACH OF THESE HAZARDS?

Sacramento County

Priority Hazards:

- Aquatic Nuisance Species (plant/animal)
- Climate Change
- Dam Failure
- Drought & Water Shortage (w/tree mortality)
- Earthquake (w/subhazards)
- Flood: 1%/0.5%/0.2% Annual Chance
- Flood: Localized Stormwater
- Landslide, Mudslide, and Debris Flow
- Levee Failure
- Sea Level Rise
- Severe Weather: Extreme Cold and Freeze
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rains and Storms (Hail, Lightning, Wind)
- Severe Weather: High Winds and Tornadoes
- Subsidence
- Wildfire (w/smoke and air quality)

Non-Priority Hazards:

-
-

City of Citrus Heights

Priority Hazards:

- Climate Change
- Dam Failure
- Drought & Water Shortage (w/tree mortality)
- Flood: 1%/0.5%/0.2% annual chance
- Flood: Localized/Stormwater
- Severe Weather: Extreme Cold and Freeze
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rains and Storms (Hail, Lightning, Wind)
- Severe Weather: High Winds and Tornadoes
- Wildfire (w/smoke and air quality)

Non-Priority Hazards:

- Aquatic Nuisance Species (plant/animal)
- Earthquake (w/subhazards)
- Landslide, Mudslide, and Debris Flow
- Levee Failure
- Sea Level Rise?
- Subsidence
-

City of Elk Grove

Priority Hazards:

- Climate Change
- Dam Failure
- Drought & Water Shortage (w/tree mortality)
- Earthquake (w/subhazards)
- Flood: 1%/0.5%/0.2% annual chance
- Flood: Localized/Stormwater
- Levee Failure
- Severe Weather: Extreme Cold and Freeze
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rains and Storms (Hail, Lightning, Wind)
- Wildfire (w/smoke and air quality)

Non-Priority Hazards:

- Aquatic Nuisance Species (plant/animal)
- Landslide, Mudslide, and Debris Flow
- Sea level rise?
- Severe Weather: High Winds and Tornadoes
- Subsidence
-

City of Folsom

Priority Hazards:

- Aquatic Nuisance Species (plant/animal)
- Climate Change
- Dam Failure
- Drought & Water Shortage (w/tree mortality)
- Flood: 1%/0.5%/0.2% annual chance
- Flood: Localized/Stormwater
- Severe Weather: Extreme Cold and Freeze
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rains and Storms (Hail, Lightning, Wind)
- Severe Weather: High Winds and Tornadoes
- Wildfire (w/smoke and air quality)

Non-Priority Hazards:

- Earthquake (w/subhazards)
- Landslide, Mudslide, and Debris Flow
- Levee Failure
- Sea level rise?
- Subsidence
-

City of Galt

Priority Hazards:

- Climate Change
- Drought & Water Shortage (w/tree mortality)
- Flood: 1%/0.5%/0.2% annual chance
- Flood: Localized/Stormwater
- Severe Weather: Heavy Rains and Storms (Hail, Lightning, Wind)
- Wildfire (w/smoke and air quality)

Non-Priority Hazards:

- Aquatic Nuisance Species (plant/animal)
- Dam Failure
- Earthquake (w/subhazards)
- Landslide, Mudslide, and Debris Flow
- Levee Failure
- Sea Level Rise?
- Severe Weather: Extreme Cold and Freeze
- Severe Weather: Extreme Heat
- Severe Weather: High Winds and Tornadoes
- Subsidence
-

City of Isleton

Priority Hazards:

- Climate Change
- Drought & Water Shortage (w/tree mortality)
- Flood: 1%/0.5%/0.2% annual chance
- Flood: Localized/Stormwater

Non-Priority Hazards:

- Aquatic Nuisance Species (plant/animal)
- Dam Failure
- Earthquake (w/subhazards)
- Landslide, Mudslide, and Debris Flow
- Severe Weather: Extreme Cold and Freeze

- Levee Failure
- Sea Level Rise?
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rains and Storms (Hail, Lightning, Wind)

- Severe Weather: High Winds and Tornadoes
- Subsidence
- Wildfire (w/smoke and air quality)
-

City of Rancho Cordova

Priority Hazards:

- Climate Change
- Dam Failure
- Drought & Water Shortage (w/tree mortality)
- Earthquake (w/subhazards)
- Flood: 1%/0.5%/0.2% annual chance
- Flood: Localized/Stormwater

Non-Priority Hazards:

- Aquatic Nuisance Species (plant/animal)
- Landslide, Mudslide, and Debris Flow
- Levee Failure
- Sea Level Rise?

- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rains and Storms (Hail, Lightning, Wind)
- Severe Weather: High Winds and Tornadoes
- Wildfire (w/smoke and air quality)

- Severe Weather: Extreme Cold and Freeze
- Subsidence
-

City of Sacramento

Priority Hazards:

- Aquatic Nuisance Species (plant/animal)
- Climate Change
- Dam Failure
- Drought & Water Shortage (w/tree mortality)
- Earthquake (w/subhazards)
- Flood: 1%/0.5%/0.2% Annual Chance
- Flood: Localized Stormwater

Non-Priority Hazards:

- Landslide, Mudslide, and Debris Flow
- Subsidence

- Levee Failure
- Severe Weather: Extreme Cold and Freeze
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rains and Storms (Hail, Lightning, Wind)
- Severe Weather: High Winds and Tornadoes
- Wildfire (w/smoke and air quality)

- Sea Level Rise?
-

American River Flood Control District

Priority Hazards:

- Flood: 1%/0.5%/0.2% Annual Chance
- Flood: Localized Stormwater
- Levee Failure
- Severe Weather: Heavy Rains and Storms (Hail, Lightning, Wind)

Non-Priority Hazards:

- Aquatic Nuisance Species (plant/animal)
- Climate Change
- Dam Failure
- Drought & Water Shortage (w/tree mortality)
- Earthquake (w/subhazards)
- Landslide, Mudslide, and Debris Flow
- Sea Level Rise?
- Severe Weather: Extreme Cold and Freeze
- Severe Weather: Extreme Heat
- Severe Weather: High Winds and Tornadoes
- Subsidence
- Wildfire (w/smoke and air quality)

Cosumnes Community Services District/Fire

Priority Hazards:

- Drought & Water Shortage (w/tree mortality)
- Flood: 1%/0.5%/0.2% Annual Chance
- Levee Failure
- Severe Weather: Extreme Heat
- Wildfire (w/smoke and air quality)

Non-Priority Hazards:

- Aquatic Nuisance Species (plant/animal)
- Climate Change
- Dam Failure
- Earthquake (w/subhazards)
- Flood: Localized Stormwater
- Landslide, Mudslide, and Debris Flow
- Sea Level Rise
- Severe Weather: Extreme Cold and Freeze
- Severe Weather: Heavy Rains and Storms (Hail, Lightning, Wind)
- Severe Weather: High Winds and Tornadoes
- Subsidence

Citrus Heights Water District

Priority Hazards:

- Dam Failure
- Drought & Water Shortage (w/tree mortality)
- Earthquake (w/subhazards)
- Severe Weather: Extreme Cold and Freeze

Non-Priority Hazards:

- Aquatic Nuisance Species (plant/animal)
- Climate Change
- Flood: 1%/0.5%/0.2% annual chance
- Flood: Localized/Stormwater
- Landslide, Mudslide, and Debris Flow
- Levee Failure
- Sea Level Rise?
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rains and Storms (Hail, Lightning, Wind)
- Severe Weather: High Winds and Tornadoes
- Subsidence
- Wildfire (w/smoke and air quality)

Los Rios Community College District

Priority Hazards:

- Severe Weather: Heavy Rains and Storms (Hail, Lightning, Wind)
-

Non-Priority Hazards:

- Aquatic Nuisance Species (plant/animal)
- Climate Change
- Dam Failure
- Drought & Water Shortage (w/tree mortality)
- Earthquake (w/subhazards)
- Flood: 1%/0.5%/0.2% Annual Chance
- Flood: Localized Stormwater
- Landslide, Mudslide, and Debris Flow
- Levee Failure
- Sea Level Rise?
- Severe Weather: Extreme Cold and Freeze
- Severe Weather: Extreme Heat
- Severe Weather: High Winds and Tornadoes
- Subsidence
- Wildfire (w/smoke and air quality)

Sacramento Area Sewer District

Priority Hazards:

- Climate Change
- Dam Failure
- Flood: 1%/0.5%/0.2% annual chance
- Levee Failure
- Wildfire (w/smoke and air quality)

Non-Priority Hazards:

- Aquatic Nuisance Species (plant/animal)
- Drought & Water Shortage (w/tree mortality)
- Earthquake (w/subhazards)
- Flood: Localized/Stormwater
- Landslide, Mudslide, and Debris Flow
- Sea Level Rise?
- Severe Weather: Extreme Cold and Freeze
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rains and Storms (Hail, Lightning, Wind)
- Severe Weather: High Winds and Tornadoes
- Subsidence

Sacramento County Water Agency

Priority Hazards:

- Aquatic Nuisance Species (plant/animal)
- Climate Change
- Dam Failure
- Drought & Water Shortage (w/tree mortality)
- Earthquake (w/subhazards)
- Flood: 1%/0.5%/0.2% Annual Chance
- Flood: Localized Stormwater
- Landslide, Mudslide, and Debris Flow
- Levee Failure
- Severe Weather: Extreme Cold and Freeze
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rains and Storms (Hail, Lightning, Wind)
- Severe Weather: High Winds and Tornadoes

Non-Priority Hazards:

- Sea Level Rise?
- Subsidence
- Wildfire
-

Sacramento Metro Fire District

Priority Hazards:

- Climate Change
- Dam Failure
- Drought & Water Shortage (w/tree mortality)
- Earthquake (w/subhazards)
- Flood: 1%/0.5%/0.2% Annual Chance
- Flood: Localized Stormwater

Non-Priority Hazards:

- Aquatic Nuisance Species (plant/animal)
- Landslide, Mudslide, and Debris Flow
- Sea Level Rise?

- Levee Failure
- Severe Weather: Extreme Cold and Freeze
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rains and Storms (Hail, Lightning, Wind)
- Severe Weather: High Winds and Tornadoes
- Wildfire (w/smoke and air quality)

- Subsidence
-

Southgate Recreation and Park District***Priority Hazards:***

- Climate Change
- Dam Failure
- Drought & Water Shortage (w/tree mortality)
- Flood: 1%/0.5%/0.2% Annual Chance
- Flood: Localized Stormwater
- Levee Failure

Non-Priority Hazards:

- Aquatic Nuisance Species (plant/animal)
- Earthquake (w/subhazards)
- Landslide, Mudslide, and Debris Flow

- Severe Weather: Extreme Cold and Freeze
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rains and Storms (Hail, Lightning, Wind)
- Severe Weather: High Winds and Tornadoes
- Wildfire (w/smoke and air quality)

- Sea Level Rise?
- Subsidence
-

Twin Rivers Unified School District***Priority Hazards:***

- Drought & Water Shortage (w/tree mortality)
- Flood: 1%/0.5%/0.2% annual chance
- Flood: Localized/Stormwater
- Levee Failure
- Severe Weather: Extreme Cold and Freeze

Non-Priority Hazards:

- Aquatic Nuisance Species (plant/animal)
- Climate Change
- Dam Failure
- Earthquake (w/subhazards)
- Landslide, Mudslide, and Debris Flow

- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rains and Storms (Hail, Lightning, Wind)
- Wildfire (w/smoke and air quality)

- Sea Level Rise?
- Severe Weather: High Winds and Tornadoes
- Subsidence
-

Reclamation District 3

Priority Hazards:

- Flood: 1%/0.5%/0.2% annual chance
- Flood: Localized/Stormwater
- Levee Failure
- Sea Level Rise?
- Severe Weather: Heavy Rains and Storms (Hail, Lightning, Wind)

Non-Priority Hazards:

- Aquatic Nuisance Species (plant/animal)
- Climate Change
- Dam Failure
- Drought & Water Shortage (w/tree mortality)
- Earthquake (w/subhazards)
- Landslide, Mudslide, and Debris Flow
- Severe Weather: Extreme Heat
- Severe Weather: High Winds and Tornadoes
- Subsidence
- Wildfire (w/smoke and air quality)
-

BALMD

Priority Hazards:

- Dam Failure
- Flood: 1%/0.5%/0.2% annual chance
- Flood: Localized/Stormwater
- Levee Failure
- Sea Level Rise?
- Severe Weather: Heavy Rains and Storms (Hail, Lightning, Wind)
-

Non-Priority Hazards:

- Aquatic Nuisance Species (plant/animal)
- Climate Change
- Drought & Water Shortage (w/tree mortality)
- Earthquake (w/subhazards)
- Landslide, Mudslide, and Debris Flow
- Severe Weather: Extreme Cold and Freeze
- Severe Weather: Extreme Heat
- Severe Weather: High Winds and Tornadoes
- Subsidence
- Wildfire (w/smoke and air quality)
-

Reclamation District 341

Priority Hazards:

- Aquatic Nuisance Species (plant/animal)
- Climate Change
- Earthquake (w/subhazards)
- Flood: 1%/0.5%/0.2% annual chance
- Levee Failure
- Sea Level Rise?
- Severe Weather: Heavy Rains and Storms (Hail, Lightning, Wind)
- Severe Weather: High Winds and Tornadoes
- Subsidence
-

Non-Priority Hazards:

- Dam Failure
- Drought & Water Shortage (w/tree mortality)
- Flood: Localized/Stormwater
- Landslide, Mudslide, and Debris Flow
- Severe Weather: Extreme Cold and Freeze
- Severe Weather: Extreme Heat
- Wildfire (w/smoke and air quality)
-

Reclamation District 349

Priority Hazards:

- Flood: 1%/0.5%/0.2% annual chance
- Flood: Localized/Stormwater
- Levee Failure
- Sea Level Rise?
- Severe Weather: Heavy Rains and Storms (Hail, Lightning, Wind)

Non-Priority Hazards:

- Aquatic Nuisance Species (plant/animal)
- Climate Change
- Dam Failure
- Drought & Water Shortage (w/tree mortality)
- Earthquake (w/subhazards)
- Landslide, Mudslide, and Debris Flow
- Severe Weather: Extreme Cold and Freeze
- Severe Weather: Extreme Heat
- Severe Weather: High Winds and Tornadoes
- Subsidence
- Wildfire (w/smoke and air quality)

Reclamation District 369

Priority Hazards:

- Dam Failure
- Flood: 1%/0.5%/0.2% annual chance
- Flood: Localized/Stormwater
- Levee Failure
- Sea Level Rise?
- Severe Weather: Heavy Rains and Storms (Hail, Lightning, Wind)

Non-Priority Hazards:

- Aquatic Nuisance Species (plant/animal)
- Climate Change
- Drought & Water Shortage (w/tree mortality)
- Earthquake (w/subhazards)
- Landslide, Mudslide, and Debris Flow
- Severe Weather: Extreme Cold and Freeze
- Severe Weather: Extreme Heat
- Severe Weather: High Winds and Tornadoes
- Subsidence
- Wildfire (w/smoke and air quality)

Reclamation District 551

Priority Hazards:

- Flood: 1%/0.5%/0.2% annual chance
- Flood: Localized/Stormwater
- Levee Failure
- Sea Level Rise?
- Severe Weather: Heavy Rains and Storms (Hail, Lightning, Wind)

Non-Priority Hazards:

- Aquatic Nuisance Species (plant/animal)
- Climate Change
- Dam Failure
- Drought & Water Shortage (w/tree mortality)
- Earthquake (w/subhazards)
- Landslide, Mudslide, and Debris Flow
- Severe Weather: Extreme Cold and Freeze
- Severe Weather: Extreme Heat
- Severe Weather: High Winds and Tornadoes
- Subsidence
- Wildfire (w/smoke and air quality)

Reclamation District 554

Priority Hazards:

- Dam Failure
- Flood: 1%/0.5%/0.2% annual chance
- Flood: Localized/Stormwater
- Levee Failure

- Sea Level Rise?
- Severe Weather: Heavy Rains and Storms (Hail, Lightning, Wind)
-

Non-Priority Hazards:

- Aquatic Nuisance Species (plant/animal)
- Climate Change
- Drought & Water Shortage (w/tree mortality)
- Earthquake (w/subhazards)
- Landslide, Mudslide, and Debris Flow
- Severe Weather: Extreme Cold and Freeze

- Severe Weather: Extreme Heat
- Severe Weather: High Winds and Tornadoes
- Subsidence
- Wildfire (w/smoke and air quality)
-

Reclamation District 556

Priority Hazards:

- Dam Failure
- Flood: 1%/0.5%/0.2% annual chance
- Flood: Localized/Stormwater
- Levee Failure

- Sea Level Rise?
- Severe Weather: Heavy Rains and Storms (Hail, Lightning, Wind)
-

Non-Priority Hazards:

- Aquatic Nuisance Species (plant/animal)
- Climate Change
- Drought & Water Shortage (w/tree mortality)
- Earthquake (w/subhazards)
- Landslide, Mudslide, and Debris Flow

- Severe Weather: Extreme Cold and Freeze
- Severe Weather: Extreme Heat
- Severe Weather: High Winds and Tornadoes
- Subsidence
- Wildfire (w/smoke and air quality)

Reclamation District 563

Priority Hazards:

- Flood: 1%/0.5%/0.2% annual chance
- Flood: Localized/Stormwater
- Levee Failure
- Sea Level Rise?

- Severe Weather: Heavy Rains and Storms (Hail, Lightning, Wind)
- Subsidence
-

Non-Priority Hazards:

- Aquatic Nuisance Species (plant/animal)
- Climate Change
- Dam Failure
- Drought & Water Shortage (w/tree mortality)
- Earthquake (w/subhazards)

- Landslide, Mudslide, and Debris Flow
- Severe Weather: Extreme Cold and Freeze
- Severe Weather: Extreme Heat
- Severe Weather: High Winds and Tornadoes
- Wildfire (w/smoke and air quality)

Reclamation District 800

Priority Hazards:

- Climate Change
- Flood: 1%/0.5%/0.2% annual chance
- Levee Failure
- Sea Level Rise?

- Severe Weather: Heavy Rains and Storms (Hail, Lightning, Wind)
- Severe Weather: High Winds and Tornadoes
-

Non-Priority Hazards:

- Aquatic Nuisance Species (plant/animal)
- Dam Failure
- Drought & Water Shortage (w/tree mortality)
- Earthquake (w/subhazards)
- Flood: Localized/Stormwater

- Landslide, Mudslide, and Debris Flow
- Severe Weather: Extreme Cold and Freeze
- Severe Weather: Extreme Heat
- Subsidence
- Wildfire (w/smoke and air quality)

Reclamation District 1000

Priority Hazards:

- Aquatic Nuisance Species (plant/animal)
- Climate Change
- Flood: 1%/0.5%/0.2% annual chance
- Levee Failure
- Sea Level Rise?

- Severe Weather: Heavy Rains and Storms (Hail, Lightning, Wind)
- Severe Weather: High Winds and Tornadoes
-

Non-Priority Hazards:

- Dam Failure
- Drought & Water Shortage (w/tree mortality)
- Earthquake (w/subhazards)
- Flood: Localized/Stormwater
- Landslide, Mudslide, and Debris Flow

- Severe Weather: Extreme Cold and Freeze
- Severe Weather: Extreme Heat
- Subsidence
- Wildfire (w/smoke and air quality)

Reclamation District 1002

Priority Hazards:

- Dam Failure
- Flood: 1%/0.5%/0.2% annual chance
- Flood: Localized/Stormwater
- Levee Failure

- Sea Level Rise?
- Severe Weather: Heavy Rains and Storms (Hail, Lightning, Wind)
-

Non-Priority Hazards:

- Aquatic Nuisance Species (plant/animal)
- Climate Change
- Drought & Water Shortage (w/tree mortality)
- Earthquake (w/subhazards)
- Landslide, Mudslide, and Debris Flow

- Severe Weather: Extreme Cold and Freeze
- Severe Weather: Extreme Heat
- Severe Weather: High Winds and Tornadoes
- Subsidence
- Wildfire (w/smoke and air quality)

Reclamation District 1601

Priority Hazards:

- Flood: 1%/0.5%/0.2% annual chance

- Flood: Localized/Stormwater

- Levee Failure
- Sea Level Rise?

- Subsidence

Non-Priority Hazards:

- Aquatic Nuisance Species (plant/animal)
- Climate Change
- Dam Failure
- Drought & Water Shortage (w/tree mortality)
- Earthquake (w/subhazards)
- Landslide, Mudslide, and Debris Flow

- Severe Weather: Extreme Cold and Freeze
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rains and Storms (Hail, Lightning, Wind)
- Severe Weather: High Winds and Tornadoes
- Wildfire (w/smoke and air quality)

Reclamation District 2111

Priority Hazards:

- Flood: 1%/0.5%/0.2% annual chance
- Flood: Localized/Stormwater
- Levee Failure
- Sea Level Rise?

- Severe Weather: Heavy Rains and Storms (Hail, Lightning, Wind)
- Subsidence

Non-Priority Hazards:

- Aquatic Nuisance Species (plant/animal)
- Climate Change
- Dam Failure
- Drought & Water Shortage (w/tree mortality)
- Earthquake (w/subhazards)
- Landslide, Mudslide, and Debris Flow

- Severe Weather: Extreme Cold and Freeze
- Severe Weather: Extreme Heat
- Severe Weather: High Winds and Tornadoes
- Wildfire (w/smoke and air quality)
-

Mitigation Strategy: Goals

The most important element of the LHMP is the resulting mitigation strategy which serves as the long-term blueprint for reducing potential losses identified in the risk assessment. The mitigation strategy is comprised of three components:

13. Mitigation Goals
14. Mitigation Actions
15. Mitigation Action (Implementation) Plan

Mitigation Goals

Up to now, the Hazard Mitigation Planning Committee (HMPC) has been involved in collecting and providing data for the 2026 Sacramento County Local Hazard Mitigation Plan Update. From this information, a Risk Assessment has been developed that describes the risk and vulnerability of Sacramento to identified hazards and includes an assessment of the County's current capabilities for countering these threats through existing policies, programs, and projects.

This analysis identifies areas where improvements could or should be made. Formulating Goals should lead to incorporating these improvements into the Mitigation Strategy portion of the LHMP. Our planning goals should provide direction for what risk reduction activities can be undertaken to make the Sacramento County Planning Area more disaster resilient.

Mitigation Goals are general guidelines that represent the County's vision for reducing or avoiding losses from identified hazards. Goals are stated without regard for achievement, that is, implementation, cost, schedule, and means are not considered.

Goals are public policy statements that:

- **Represent basic desires of the jurisdiction;**
- **Encompass all aspects of planning area, public and private;**
- **Are nonspecific, in that they refer to the quality (not the quantity) of the outcome;**
- **Are future-oriented, in that they are achievable in the future; and**
- **Are time-independent, in that they are not scheduled events.**
 - ✓ While goals are not specific (quantitative), they should not be so general as to be meaningless or unachievable.
 - ✓ Goal statements may form the basis for objectives. They should be stated in such a way as to develop one or more objectives related to each goal.
 - ✓ The key point in writing goals is to remember that they must deal with results, not the activities that produce those results.
 - ✓ Consider other planning area goals from other regional/county/city programs, plans and priorities.

Types/Sources of other area mitigation plans/ programs include:

- General Plans
- Master and Strategic Plans

- Stormwater Program and Plans
- Flood/Levee/Stormwater Management Plans and Studies
- Drought Plans, Urban/Integrated Regional Water Management Plans
- Earthquake Studies and Plans
- Community Wildfire Protection Plans
- Strategic Fire Plans
- Dam Emergency Action Plans
- Emergency Operations Plans
- Climate Plans
- Others?

2018 California State Hazard Mitigation Plan Goals

1. Significantly reduce life loss and injuries.
2. Minimize damage to structures and property, as well as minimizing interruption of essential services and activities.
3. Protect the environment.
4. Promote community resilience through integration of hazard mitigation with public policy and standard business practices.

2023 State Hazard Mitigation Plan Goals

GOAL 1—Significantly reduce risk to life, community lifelines, the environment, property, and infrastructure by planning and implementing whole-community risk reduction and resilience strategies.

GOAL 2—Build capacity and capabilities to increase disaster resilience among historically underserved populations, individuals with access and functional needs, and communities disproportionately impacted by disasters and climate change.

GOAL 3—Incorporate equity metrics, tools, and strategies into all mitigation planning, policy, funding, outreach, and implementation efforts.

GOAL 4—Apply the best available science and authoritative data to design, implement, and prioritize projects that enhance resilience to natural hazards and climate change impacts.

GOAL 5—Integrate mitigation principles into laws, regulations, policies, and guidance to support equitable outcomes to benefit the whole community.

GOAL 6— Significantly reduce barriers to timely, efficient, and effective hazard mitigation planning and action.

Goals from Other Sacramento Area Plans

Sacramento County Emergency Operations Plan (EOP), Sacramento County OES, May 2022

Operational Goals: During the response phase, the agencies charged with responsibilities in this plan should focus on the following five goals:

1 Mitigate Hazards

2 Meet basic human needs

3 Address needs of People with Access and Functional Needs

4 Restore essential services

5 Support community and economic recovery

Operational Priorities: Operational priorities govern resource allocation and the response strategies for the County and its political subdivisions during an emergency. Below are operational priorities addressed in this plan:

- **Save Lives** – The preservation of life is the top priority and takes precedence over all other considerations.
- **Protect Health and Safety** – Measures should be taken to mitigate the impact of the emergency on public health and safety.
- **Protect Property** – All feasible efforts must be made to protect public and private property and resources, including critical infrastructure, from damage during and after an emergency.
- **Preserve the Environment** – All possible efforts must be made to protect the environment from damage during an emergency.

Sacramento County General Plan Safety Element, 2017

Seismic and Geologic Hazards

GOAL:	Minimize the loss of life, injury, and property damage due to seismic and geological hazards.
Policy:	SA-1. The County shall require geotechnical reports and impose the appropriate mitigation measures for new development located in seismic and geologically sensitive areas.
Policy:	SA-2. The County shall protect citizens from the hazards of old architecture affected by seismic activity
Policy:	SA-3. The County shall support efforts by Federal, State, and other local jurisdictions to investigate local seismic and geological hazards and support those programs that effectively mitigate these hazards.
Policy:	SA-4. The County shall prohibit development on ground surfaces which exceed 40 percent in slope, such as the bluff areas along the American River. Development shall be set back from these slopes at a distance established by the Zoning Code

Flooding

GOAL:	Minimize the loss of life, injury, and property damage due to flood hazards.
Policy:	SA-5. A comprehensive drainage plan for major planning efforts shall be prepared for streams and their tributaries prior to any development within the 100-year floodplain and/or the 200-year floodplain in areas subject to the Urban Level of Flood Protection, defined by full watershed development without channel modifications. The plan shall: a. Determine the elevation of the future 100-year flood and/or the 200-year flood in areas subject to the Urban Level of Flood Protection, associated with planned and full development of the watershed; b. Determine the boundaries of the future 100-year floodplain and/or the 200-year floodplain in areas subject to the Urban Level of Flood Protection, for both flood elevations (planned and full development) based on minimum 2-foot contour intervals; c. Assess the feasibility of gravity drainage into the existing flowline of the stream; d. Assess the feasibility of alternative means of drainage into the stream; e. Identify potential locations for sedimentation ponds and other stormwater treatment facilities; f. Determine practical channel improvements and/or detention basins to provide the flood control needs of the proposed development; g. Determine the location and extent of marsh, vernal pool and riparian habitat; h. Develop measures for protecting and mitigating natural habitat; i. Develop measures for protecting and mitigating for federal and state listed endangered species; j. Develop and ensure implementation of measures that would reduce vector larvae; k. Identify appropriate plant species to be included as part of the natural features of the comprehensive drainage plan. (Modified 2016)
Policy:	SA-6. The County will coordinate with the City of Sacramento, the Army Corps of Engineers, the Sacramento Area Flood Control Agency, and other Federal, State and local governments and agencies to develop a plan to finance, develop and construct flood control project improvements to reduce flooding potential in Sacramento County. The construction of flood control projects along the Sacramento and American Rivers and the immediate connection of local streams to these rivers shall be included in these projects. Such projects should provide 200-year flood protection.
Policy:	SA-6a. The County will continue to coordinate with parties responsible for flood management facilities and structures (e.g., pump stations, levees, canals, channels, and dams) to provide proper maintenance and/or improvements. (Added 2016)
Policy:	SA-6b. The County will continue to coordinate with relevant organizations and agencies (e.g., Federal Emergency Management Agency (FEMA) and State of California Department of Water Resources (CADWR)) when updating floodplain mapping, flood management plans, local hazard mitigation plans, and other emergency response plans to consider the impacts of urbanization and climate change on long-term flood safety and flood event probabilities. (Added 2016)
Policy:	SA-6c. The County will continue to coordinate with local, regional, state, and federal agencies to maintain an adequate flood management information base, prepare risk assessments, and identify strategies to mitigate flooding impacts. (Added 2016)
Policy:	SA-7. In accordance with the County Floodplain Management Ordinance, the County shall locate, when feasible, new essential public facilities outside of flood hazard zones ¹ , including hospitals and health care facilities, emergency shelters, fire stations, emergency command centers, and emergency communications facilities; or identify construction methods or other methods to minimize damage if these facilities are located in flood hazard zones.
Policy:	SA-8. Maintain the structural and operational integrity of essential public facilities during flooding.
Policy:	SA-9. New and modified bridge structures should minimize any increase in water surface elevations of the 100-year floodplain, or the 200-year floodplain in areas subject to the Urban Level of Flood Protection. (Modified 2016)

GOAL:	Minimize the loss of life, injury, and property damage due to flood hazards.
Policy:	SA-10. Fill within the 100-year floodplain of creeks outside of the Urban Service Boundary is permissible to accommodate structures (e.g., residential, commercial, accessory) and septic systems, and only when the Board of Supervisors finds that the fill will not impede water flows or storm runoff capacity. Such development shall not cause an increase in base flood elevation of the 100-year floodplain exceeding 0.10 feet, unless analysis clearly indicated that the physical and/or economic use of adjacent property within the floodplain will not be adversely affected. A permit is required if the fill is within the jurisdiction of the Central Valley Flood Protection Board.
Policy:	SA-11. The County shall implement the improvement of natural drainage channels and certain floodplains for urbanized or urbanizing portions of the County to reduce local flooding. Such improvements shall comply with the General Plan policies contained in the Conservation Element, Urban Streams, and Channel Modification Section.
Policy:	SA-12. The County shall continue local efforts that encourage implementation of the Federal Flood Insurance Program.
Policy:	SA-13. Where new upstream development in Sacramento County will increase or potentially impact runoff onto parcels downstream in a neighboring jurisdiction, such as the City of Sacramento, Sacramento County will coordinate with the appropriate neighboring jurisdiction to mitigate such impacts.
Policy:	SA-14. The County shall require, when deemed to be physically or ecologically necessary, all new urban development and redevelopment projects to incorporate runoff control measures to minimize peak flows of runoff and/or assist in financing or otherwise implementing Comprehensive Drainage Plans.
Policy:	SA-15. The County shall regulate, through zoning and other ordinances, land use and development in all areas subject to potential flooding and prohibit urban uses on unprotected flood land.
Policy:	SA-16. Deny creation of parcels that do not have buildable areas outside the 100-year floodplain, or the 200-year floodplain in areas subject to the Urban Level of Flood Protection, unless otherwise allowed in the Floodplain Management Ordinance. (Modified 2016)
Policy:	SA-17. For residential zoning, the area outside the 100-year floodplain, or the 200-year floodplain in areas subject to the Urban Level of Flood Protection, must be contiguous or reasonably situated to provide buildable area for a residence and associated structures. Examples of structures include swimming pools, sheds, barns, detached garages, and other outbuildings that are normally associated with residential development. There may be exceptions (such as the Delta area) as allowed in the Floodplain Management Ordinance. (Modified 2016)
Policy:	SA-18. Vehicular access to the buildable area of newly created parcels must be at or above the 10-year flood elevation. Exceptions may be made when the existing public street from which access is obtained is below the 10-year flood elevation. There may be exceptions (such as the Delta area) as allowed in the Floodplain Management Ordinance.
Policy:	SA-18a. Provide unobstructed access to levees on county-owned lands, whenever practicable, for maintenance and emergencies. Require setbacks and easements to provide access to levees from private property. (Added 2016)
Policy:	SA-18b. Urban flood control levees should have adequate setbacks consistent with local, regional, State, and federal design and management standards. (Added 2016)
Policy:	SA-19. Creation of lots that require watercourse crossings for single lots, or that will likely encourage watercourse crossings to be built by property owners (lots with useable area on both sides of a watercourse) will not be allowed unless a detailed hydraulic study is approved by Water Resources and there is found to be no adverse impact in accordance with the County Floodplain Management Ordinance.
Policy:	SA-20. Levees for the purpose of floodplain reclamation for development shall be strongly discouraged. Floodplain restoration shall be encouraged to provide flood protection and enhancement and protection of a riparian ecosystem.

GOAL:	Minimize the loss of life, injury, and property damage due to flood hazards.
Policy:	SA-21. If levee construction is approved to reclaim floodplain for new development, 200-year flood protection is required.
Policy:	SA-22. Areas within a 100-year floodplain, or within the 200-year floodplain in areas subject to the Urban Level of Flood Protection, shall not be upzoned to a more intensive use unless and until a Master Drainage Plan is prepared that identifies areas of the floodplain that may be developed. (Modified 2016)
Policy:	SA-22a. Sacramento County will evaluate development projects and all new construction located within a defined Flood Hazard Zone (FHZ) to determine whether the 200-year Urban Level of Flood Protection or 100-year FEMA flood protection applies, and whether the proposed development or new construction is consistent with that standard. Prior to approval of development projects or new construction subject to either standard, the appropriate authority must make specific finding(s) related to the following: a. Urban Level of Flood Protection standard (200-year) applies to projects in a Flood Hazard Zone that meet certain criteria, developed by the State of California Department of Water Resources, related to urbanization, watershed size and potential flood depth. b. Federal Emergency Management Agency (FEMA) standard of protection (100-year) applies to projects in a Special Flood Hazard Area that are not subject to the Urban Level of Flood Protection. (Added 2016)
Policy:	SA-22b. New development shall be elevated as required by the applicable flood standards (100-year, or 200-year in areas subject to the Urban Level of Flood Protection) and should be constructed to be resistant to flood damage consistent with the Floodplain Management Ordinance. (Added 2016)

Fire Hazards

GOAL:	Minimize the loss of life, injury, and property damage due to fire hazards.
Policy:	SA-23. The County shall require that all new development meets the local fire district standards for adequate water supply and pressure, fire hydrants, and access to structures by firefighting equipment and personnel.
Policy:	SA-24. The County shall require, unless it is deemed infeasible to do so, the use of both natural and mechanical vegetation control in lieu of burning or the use of chemicals in areas where hazards from natural cover must be eliminated, such as levees and vacant lots.
Policy:	SA-25. The County shall work with local fire districts to develop high visibility fire prevention programs, including those which provide voluntary home inspections and awareness of home fire prevention measures.
Policy:	SA-26. The County and fire districts shall develop programs to provide citizens with self-preparedness and community readiness skills for large or extended accidental, natural, and terrorist emergencies/incidents.
Policy:	SA-27. The County shall require, where appropriate, the use of fire resistant landscaping and building materials for new construction developments that are cost effective.
Policy:	SA-28. The County shall encourage and require, to the maximum extent feasible, automatic fire sprinkler systems for all new commercial and industrial development to reduce the dependence on fire department equipment and personnel.
Policy:	SA-29. The County and fire districts will work together to regulate hazardous materials to mitigate emergency responses.
Policy:	SA-30. The County, medical community, and fire districts shall work to improve EMS response system that includes first responder emergency care and transportation services. a. Properly locating resources to provide timely response b. Paramedic services from every fire station

Emergency Response

GOAL:	An Emergency Preparedness System that can effectively respond in the event of a natural or manmade disaster.
Policy:	SA-32 The County will implement the Local Hazard Mitigation Plan in the planning and operations of the County to achieve the goals, objectives, and actions of the County's Local Hazard Mitigation Plan.
Policy:	SA-33. The County shall continue its coordinative efforts, including evacuation planning, with service agencies, the cities within the County, and cities within surrounding counties.
Policy:	SA-34. The County shall increase its efforts to inform and educate the general public of disaster response and emergency preparedness procedures.
Policy:	SA-35. The County shall ensure that the siting of critical emergency response facilities such as hospitals, fire, sheriff's offices and substations, and other emergency service facilities and utilities have minimal exposure to flooding, seismic and geological effects, fire, and explosions.
Policy:	SA-36. The County shall require that high intensity land uses proposed in areas highly susceptible to multiple hazards, such as the Delta, provide mitigation measures that include emergency evacuation routes. Consideration shall be given to the need for additional roads, particularly in the Delta, that may serve as evacuation routes. The County Regional Emergency Operations Office has a study of evacuation routes for various levee breach scenarios for reaches of the Sacramento River north of Freeport and for the American River.
Policy:	SA-37. The County shall continue to maintain its response to flood emergencies by maintaining and updating the following: a. Flood Emergency Action Plan, to address potential flooding in levee and dam inundation areas, consistent with the California Water Code, and; b. Community flood evacuation and rescue maps, making them available to the public, as appropriate. (Added 2016)

Sacramento County Goals from Previous 2021 LHMP (This is what we are updating):

GOAL 1: Minimize risk and vulnerability of the Sacramento County community to the impacts of natural hazards, including consideration of the exacerbation of natural hazards and unique hazards due to climate change; and protect lives and reduce damages and losses to property, public health, economy, and the environment.

GOAL 2: Provide protection for critical facilities, infrastructure, utilities, and services from hazard impacts, to include hardening and other efforts to establish redundancy and reliability, to prevent or minimize loss, and to facilitate recovery.

GOAL 3: Enhance public outreach, education, awareness, and preparedness for all hazards to minimize hazard related losses and to include effective strategies for reaching underserved communities and vulnerable populations.

GOAL 4: Increase community capabilities and leverage inter-agency and public-private coordination and resources to mitigate losses and to be prepared for, respond to, and recover from a disaster event.

GOAL 5: Assure conformance to federal and state hazard mitigation initiatives and maximize potential for mitigation implementation.

Other Example Goal Statements

- Minimize risk and vulnerability from natural hazards
- Increase communities' awareness of vulnerability to hazards
- Increase the use of shared resources
- Improve communities' capabilities to mitigate losses
- Maintain coordination of disaster plans with changing DHS/FEMA needs
- Maintain FEMA eligibility/position jurisdictions for grant funding
- Maintain/enhance the flood mitigation program to provide 200/500-year flood protection
- Maintain current service levels
- Provide protection for existing buildings from hazards
- Provide protection for future development from hazards
- Provide protection for natural and cultural resources from hazard impacts
- Provide protection for people's lives from hazards
- Provide protection for public health
- Provide protection for critical services (fire, police, etc.) from hazard impacts
- Provide protection for critical lifeline utilities from hazard impacts
- Reduce exposure to hazard related losses
- Reduce the number of emergency incidents
- Make better use of technology

General Recommendation for Categories of Goals

- Reduce Losses/Protection of Life, Property, Public Health, and the Environment from all Hazards
- Reduce Losses/Protection of Critical Facilities and Infrastructure from all Hazards
- Public Education
- Increase Jurisdictional Capabilities to all Hazards
- Any Hazard-specific goals
- Integrate strategies for the protection of underserved and vulnerable populations

Goals Development

The purpose of goal's development is to reach a consensus on goals for the Sacramento County 2026 LHMP Update. Provided above are the 2021 LHMP Goals and other example goals for this LHMP. ***You can confirm the previous goals, reword those above, or develop your own goals.*** It is important that the HMPC establish its own goals for this 2026 LHMP Update.

You will each be given 3 sticky notes. On each note you will write what you think the goals for this LHMP Update should be. ***Use one sticky note for each goal.***

When done, we will:

- Pin/tape them to the wall/easel-chart and arrange them by category
- Combine and reword them into 3-5 goals for the plan and send them out to the HMPC for further review and refinement

Mitigation Strategy Meetings
June 10 & 11, 2026
Day 2

Mitigation Strategy Action Development: Ground Rules

Rule 1: All participating jurisdictions **MUST** have a Mitigation Action/Project to address each of their Priority Hazards (those rated as a high or medium significance in their Hazard Identification table).

Rule 2: Every Mitigation Action/Project **MUST** be supported by Risk Assessment Data contained within Chap 4 of the Base Plan and Jurisdictional Annexes. Note: this might necessitate backfilling the hazard risk assessment data.

Rule 3: The Mitigation Actions/Projects for this 2026 LHMP should reflect each jurisdiction's WISH LIST for mitigation, regardless of funding source.

Rule 4: Any Mitigation Action/Project that might be considered for FEMA mitigation grant funding over the next 5-years covered by this LHMP **MUST** be included in this 2026 LHMP.

Rule 5: While the updated Mitigation Strategy should include all potential Mitigation Actions/Projects for the participating jurisdictions (regardless of funding source), keep in mind that the jurisdictions are **NOT** obligated to implement **ANY** of the identified Mitigation Actions/Projects – all are always subject to funding and changing priorities.

Rule 6: Each Mitigation Action/Project to be included in this LHMP **MUST** have a Mitigation Action Worksheet completed by the owning jurisdiction, department or agency. This applies to Mitigation Actions/Projects being carried forward from the County's/City's /District's previous 2021 LHMP.

REMEMBER: Having a FEMA approved LHMP for Sacramento County and participating jurisdictions is a prerequisite for being eligible to apply for FEMA pre and post disaster mitigation funding.

Mitigation Strategy: Actions

Mitigation Actions are specific projects and activities that help achieve the LHMP goals and accomplish risk reduction in the community.

Categories of Mitigation Actions

PREVENTION: Preventive measures are designed to keep the problem from occurring or getting worse. Their objective is to ensure that future development is not exposed to damage and does not increase damage to other properties.

- Planning
- Zoning
- Open Space Preservation
- Land Development Regulations
 - ✓ Subdivision regulations
 - ✓ Building Codes
 - Fire-Wise Construction
 - ✓ Floodplain development regulations
 - ✓ Geologic Hazard Areas development regulations (for roads too!)
- Storm Water Management
- Fuels Management, Fire-Breaks

EMERGENCY SERVICES: protect people during and after a disaster. A good emergency services program addresses all hazards. Measures include:

- Warning (flooding, tornadoes, winter storms, geologic hazards, fire)
 - ✓ NOAA Weather Radio
 - ✓ Sirens
 - ✓ “Reverse 911” (Emergency Notification System)
- Emergency Response
 - ✓ Evacuation & Sheltering
 - ✓ Communications
 - ✓ Backup power supply/generators
 - ✓ Emergency Planning
 - Activating the EOC (emergency management)
 - Closing streets or bridges (police or public works)
 - Shutting off power to threatened areas (utility company)
 - Holding/releasing children at school (school district)
 - Ordering an evacuation (mayor)
 - Opening emergency shelters (Red Cross)
 - Monitoring water levels (engineering)
 - Security and other protection measures (police)
- Critical Facilities Protection (Buildings or locations vital to the response and recovery effort, such as police/fire stations, hospitals, sewage treatment plants/lift stations, power substations)

- ✓ Buildings or locations that, if damaged, would create secondary disasters, such as hazardous materials facilities and nursing homes
- ✓ Lifeline Utilities Protection
- Post-Disaster Mitigation
- Building Inspections
 - ✓ ID mitigation opportunities & funding before reconstruction

PROPERTY PROTECTION: Property protection measures are used to modify buildings subject to damage rather than to keep the hazard away. A community may find these to be inexpensive measures because often they are implemented by or cost-shared with property owners. Many of the measures do not affect the appearance or use of a building, which makes them particularly appropriate for historical sites and landmarks.

- Retrofitting/disaster proofing
 - ✓ Floods
 - Wet/Dry floodproofing (barriers, shields, backflow valves)
 - Relocation/Elevation
 - Acquisition
 - Retrofitting
 - ✓ High Winds/Tornadoes
 - Safe Rooms
 - Securing roofs and foundations with fasteners and tie-downs
 - Strengthening garage doors and other large openings
 - ✓ Winter Storms
 - Immediate snow/ice removal from roofs, tree limbs
 - “Living” snow fences
 - ✓ Geologic Hazards (Landslides, earthquakes, sinkholes)
 - Anchoring, bracing, shear walls
 - Dewatering sites, agricultural practices
 - Catch basins
 - ✓ Drought
 - Improve water supply (transport/storage/conservation)
 - Remove moisture competitive plants (Tamarisk/Salt Cedar)
 - Water Restrictions/Water Saver Sprinklers/Appliances
 - Grazing on CRP lands (no overgrazing-see Noxious Weeds)
 - Create incentives to consolidate/connect water services
 - Recycled wastewater on golf courses
 - ✓ Wildfire, Grassfires
 - Replacing building components with fireproof materials
 - Roofing, screening
 - Create “Defensible Space”
 - Installing spark arrestors
 - Fuels Modification
 - ✓ Noxious Weeds/Insects

- Mowing
- Spraying
- Replacement planting
- Stop overgrazing
- Introduce natural predators

➤ Insurance

NATURAL RESOURCE PROTECTION: Natural resource protection activities are generally aimed at preserving (or in some cases restoring) natural areas. In so doing, these activities enable the natural beneficial functions of floodplains and watersheds to be better realized. These natural and beneficial floodplain functions include the following:

- storage of floodwaters
- absorption of flood energy
- reduction in flood scour
- infiltration that absorbs overland flood flow
- groundwater recharge
- removal/filtering of excess nutrients, pollutants, and sediments from floodwaters
- habitat for flora and fauna
- recreational and aesthetic opportunities

Methods of protecting natural resources include:

- Wetlands Protection
- Riparian Area/Habitat Protection/Threatened-Endangered Species
- Erosion & Sediment Control
- Best Management Practices

Best management practices (“BMPs”) are measures that reduce nonpoint source pollutants that enter the waterways. Nonpoint source pollutants come from non-specific locations. Examples of nonpoint source pollutants are lawn fertilizers, pesticides, and other farm chemicals, animal wastes, oils from street surfaces and industrial areas and sediment from agriculture, construction, mining and forestry. These pollutants are washed off the ground’s surface by stormwater and flushed into receiving storm sewers, ditches and streams. BMPs can be implemented during construction and as part of a project’s design to permanently address nonpoint source pollutants. There are three general categories of BMPs:

1. Avoidance: Setting construction projects back from the stream.
2. Reduction: Preventing runoff that conveys sediment and other water-borne pollutants, such as planting proper vegetation and conservation tillage.
3. Cleanse: Stopping pollutants after they are en route to a stream, such as using grass drainageways that filter the water and retention and detention basins that let pollutants settle to the bottom before they are drained:

- Dumping Regulations
- Set-back regulations/buffers
- Fuels Management
- Water Use Restrictions

- Landscape Management
- Weather Modification

STRUCTURAL: Projects that have traditionally been used by communities to control flows and water surface elevations. Structural projects keep flood waters away from an area. They are usually designed by engineers and managed or maintained by public works staff. These measures are popular with many because they “stop” flooding problems. However, structural projects have several important shortcomings that need to be kept in mind when considering them for flood hazard mitigation:

- They are expensive, sometimes requiring capital bond issues and/or cost sharing with Federal agencies, such as the U.S. Army Corps of Engineers or the Natural Resources Conservation Service.
- They disturb the land and disrupt natural water flows, often destroying habitats or requiring Environmental Assessments.
- They are built to a certain flood protection level that can be exceeded by a larger flood, causing extensive damage.
- They can create a false sense of security when people protected by a structure believe that no flood can ever reach them.
- They require regular maintenance to ensure that they continue to provide their design protection level.

Structural measures include:

- Detention/Retention structures
- Erosion and Sediment Control
- Basins/Low-head Weirs
- Channel Modifications
- Culvert resizing/replacement/Maintenance
- Levees and Floodwalls
- Anchoring, grading, debris basins (for landslides)
- Fencing (for snow, sand, wind)
- Drainage System Maintenance
- Reservoirs (for flood control, water storage, recreation, agriculture)
- Diversions
- Storm Sewers

PUBLIC INFORMATION: A successful hazard mitigation program involves both the public and private sectors. Public information activities advise property owners, renters, businesses, and local officials about hazards and ways to protect people and property from these hazards. These activities can motivate people to take protection:

- Hazard Maps and Data
- Outreach Projects (mailings, media, web, speakers, displays)
- Library Resources
- Real Estate Disclosure
- Environmental Education

Mitigation Actions/Projects from 2021 Sacramento County LHMP (This is what we are updating)

Action Title	Complete	Ongoing	Not Yet Started	In 2026 Update*
Sacramento County**				
All Hazard Actions				
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	X			
Action 2. Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness		X		
Action 3. County-wide Mass Care and Shelter Plan Update	X			
Action 4. County-wide Evacuation Annex Update	X			
Action 5. Evacuation Planning Countywide	X	X		
Action 6. Expand Broadband/Wifi Access		X		
Climate Change and Pandemic Actions				
Action 7. Implement and improve telecommuting and remote work access for County operations		X		
Action 8. Implement the actions contained within the Sacramento County Climate Action/Adaptation Plan		X		
Action 9. Develop and incentivize carbon sequestration plans and programs		X		
Action 10. Update the Sacramento County Climate Action for carbon neutrality by 2030		X		
Dam Failure, Earthquake (and liquefaction), Flood: 1%, 0.5%, 0.2% annual chance, Flood: Localized Flood, Levee Failure, Subsidence, and Severe Weather: Heavy Rains and Storms Actions				
Action 11. Bicycle/pedestrian bridge across Discovery Park connecting Garden Highway to the Jibboom Street bridge			X	
Action 12. Acquire Floodprone Properties		X		
Action 13. Maintain and improve railroad embankment levee from south of Freeport to south of Hood, a reach owned by CA Parks Department (Railroad Museum)			X	
Action 14. McCormack Williamson flood control weir	X			
Action 15. Flood risk mitigation for mobile home and recreational vehicle parks		X		
Action 16. Plan for Public Information (PPI)		X		
Action 17. Mitigation of repetitive loss flood areas and properties		X		
Action 18. Flood risk mapping		X		
Action 19. Storm Ready		X		
Action 20. Alder Creek flood hazard mitigation			X	
Action 21. Operational protocol for American River pump stations that are affected by the reoperation of Folsom Dam	X	X		
Action 22. Arcade Creek flood control	X	X		
Action 23. Beach Stone Lakes area flood risk reduction program		X		

Action Title	Complete	Ongoing	Not Yet Started	In 2026 Update*
Action 24. Protect critical facilities from flooding		X		
Action 25. Dam Safety (Activity 630)		X		
Action 26. Flood fighting for Delta legacy communities: Hood, Courtland, Locke, Walnut Grove		X		
Action 27. Implement Delta Small Communities		X		
Action 28. Elevate houses to reduce flood risk		X		
Action 29. Flood emergency management exercises		X		
Action 30. Flood evacuation mapping		X		
Action 31. Floodproofing non-residential structures		X		
Action 32. Flood insurance studies (modeling and mapping the special flood hazard area)		X		
Action 33. Update Hydrology Standards		X		
Action 34. Laguna Creek flood control, modeling, and mapping		X		
Action 35. Update County GIS aerial photography and LiDAR topography		X		
Action 36. Maintain and improve Sacramento River levee from south of Freeport to south of Hood, a reach owned and operated by CA DWR Maintenance Area 9		X		
Action 37. Use existing Aggregate Mining Pits for Flood Control		X		
Action 38. Implement Storm Drain Capital Improvement Plan		X		
Action 39. Woodside Condominiums Flood Risk Reduction			X	X
Action 40. Implement Actions In The Courtland Flood Risk Reduction Plan 2021		X		
Action 41. Implement Actions In The Walnut Grove West Flood Risk Reduction Plan 2021		X		
Action 42. Implement Actions In The Locke Flood Risk Reduction Plan 2021		X		
Drought & Water Shortage, Severe Weather: Extreme Heat, and Wildfire Actions				
Action 43: Reduce the urban heat island effect through the implementation of "cool communities" strategies, including but not limited to, increasing tree plantings, using cool/green roofs and cool/pervious pavements		X		
Action 44. Defensible Space and Vegetation Management; Development of Areas of Refuge		X		
Action 45. Wildfire Suppression - Regional Parks and Open Space (urban interface)		X		
Action 46. Wildfire Fighting - Support		X		
Action 47. Wildfire Suppression		X		
Severe Weather: Extreme Cold and Freeze and High Wind and Tornado Actions				
Action 48. Establish Warming Centers with Backup Power		X		
City of Citrus Heights				
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan				

Action Title	Complete	Ongoing	Not Yet Started	In 2026 Update*
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness				
Action 3. Cable Trellis w/ Vines Shading Project				
Action 4. Trash Racks and Debris Cages Project				
Action 5. Protection of Transportation Infrastructure Project				
Action 6. Neighborhood Storm Drain Project				
Action 7. Neighborhood Storm Drain Master Plan				
Action 8. Storm Drain Inlet Retrofit Project				
Action 9. Reduce Citrus Heights extreme heat events and associated hazards by Increase tree planting/canopy preservation/enhancement (this is in general plan) Project				
Action 10. Increase pedestrian and bicycle evacuation routes by constructing regional bike/pedestrian trail infrastructure, and expanding connection to neighborhoods (particularly in vulnerable areas) Project				
Action 11. Interconnected Transportation System Project				
Action 12. Critical Facility Generator Project				
Action 13. Critical Street Floodproofing Project				
Action 14. Creek Maintenance and Restoration Project				
Action 15. CMP Storm Drain Replacement Project				
City of Elk Grove Actions				
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan				
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness				
Action 3. Elk Grove Green Street Project: Repurposing Urban Runoff with Green Infrastructure Technologies				
Action 4. Mutual Aid Agreements				
Action 5. City of Elk Grove's Storm Drainage Master Plan (SDMP)				
Action 6. Create a Climate-Smart Stormwater Management System				
Action 7. Implement a Comprehensive and Climate-Smart Green Infrastructure Strategy				
Action 8. Upgrade the City's Laguna West Levee System to Mitigate Climate-Related Flood Impacts				
Action 9. Establish a Resilient Pedestrian and Bicycle Infrastructure Network				
City of Folsom Actions				
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan				
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness				
Action 3. Redevelopment Area Drainage Improvements				
Action 4. Stormwater Basin Maintenance and Operation Project				

Action Title	Complete	Ongoing	Not Yet Started	In 2026 Update*
Action 5. Stormwater Utility Fee				
Action 6. Fuel Reduction and Modification				
Action 7. Comprehensive Cooling City Strategy				
Action 8. Identification and Upgrades to Heating and Cooling Centers				
Action 9. Landscape and Irrigation Modifications				
Action 10. Landscape Ordinance and Model Water Efficient Landscape Ordinance Implementation				
Action 11. Post Disaster Staff Training				
Action 12. Weed Abatement Program				
City of Galt Actions				
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan				
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness				
Action 3. Future Development Projects shall complete a Climate Action Plan Consistency Review Checklist.				
Action 4. Develop a Robust Geographic Based System (GIS) to Geographically Locate Issues/Actions/Mitigation in the City.				
Action 5. Perform Vegetative Control of City Drainages and Channels by Natural Methods				
Action 6. Continue Work with the Other Groundwater Sustainability Agencies (GSAs) in the Cosumnes Subbasin of the San Joaquin Valley Basin (DWR Basin No. 5-022.16) who are Working Together to Develop a Single Groundwater Sustainability Plan (GSP).				
Action 7. Increase Resiliency of City Critical Infrastructure and Emergency Operations and against Hazards.				
Action 8. Maintain City Drainages, Channels and Open Spaces				
City of Isleton Actions				
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan				
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness				
Action 3. Support climate change mitigation laws				
Action 4. Support drought mitigation laws. Establish RWIP (Redundant Water for Isleton Plan)				
Action 5. Levee Reinforcement Projects				
Action 6. Implement IFIP (Isleton Flood Improvement Plan) and create and activate IFMA (Isleton Flood Management Agency)				
Action 8. Activate Emergency Operation Plan (Cooling Center)				
Action 9. Storm Water Runoff Rehabilitation Project				
Action 10. Wastewater Treatment Plant Pond Levee Elevation Raise to 200-year Flood Standard				

Action Title	Complete	Ongoing	Not Yet Started	In 2026 Update*
City of Sacramento Actions				
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan				
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness				
Action 3. Coordination with Relevant Organizations and Agencies to Consider the Impacts of Urbanization and Climate Change on Long-Term Natural Hazard Safety				
Action 4. Maintain and Identify Changes in Critical Facilities GIS Layer to Support Emergency Management Efforts				
Action 5. Community Outreach on Multi-Hazard Preparation & Pre-mitigation				
Action 6. Evaluation and Mitigation of Critical Facilities in Identified Hazard Areas				
Action 7. Retrofit of Repetitive Loss Properties				
Action 8. Safeguard Essential Communication Services				
Action 9. Multi-lingual Disaster Education				
Action 10. Cal OES Safety Assessment Program Evaluators				
Action 11. National Flood Insurance Program & Community Rating System Continuation				
Action 12. Develop a Master Generation Plan for Pump Stations				
Action 13. Develop a Disaster Housing Plan				
Action 14. Disaster Resistant Business Program				
Action 15. Develop Enhanced Emergency Planning for Special Needs Populations in the City of Sacramento Emergency Operations Plan and Other Planning Documents				
Action 16. Establish a Post-Disaster Action Plan				
Action 17. Flood Recovery Plan				
Action 18. Public Information Flood Response Plan (Action #18 from 2016)				
Action 19. Construction of a New Emergency Operation Center (EOC) (Action 19 from 2016 plan)				
Action 20. Emergency Operation Center (EOC) Expansion and Information Technology Upgrade (Action 20 from 2016 plan)				
Action 21. Protection of Transportation Infrastructure (Action 21 from 2016 plan)				
Action 22. Public Education Campaign for Everbridge System (Action 22 from 2016 plan)				
Action 23. Regional Emergency and Disaster Preparedness Exercises to Test Operational & Emergency Plans (Action 23 from the 2016 plan)				
Action 24. Special Needs and Critical Facilities Database and Advanced Warning System (Action 24 from 2016 plan)				
Action 25. Asset Inventory				

Action Title	Complete	Ongoing	Not Yet Started	In 2026 Update*
Action 26. Protection of City Information Technology Infrastructure (Action 27 from 2016 plan)				
Action 27. Travel Time Model for Lower American and Sacramento Rivers and their Major Tributaries (Action 29 from 2016 plan)				
Action 28. Watershed Spill Contamination to Drinking Water Quality: Preparedness for Events and Recovery				
Action 29. Purchase Drones for Use in Disaster Preparedness, Mitigation, and Response				
Action 30. Map and Assess Vulnerability to Sea Level Rise (Action 32 from 2016 plan)				
Action 31. Emission Study of City Sump and Pump Stations (Action 33 from 2016 plan)				
Action 32. Climate Change Mitigation Actions/Climate Change Adaptation Plan for Drinking Water Quality (Action 34 from 2016 plan)				
Action 33. Harmful Algal Bloom (HAB) Surveillance and Response Planning (Action 35 from 2016 plan)				
Action 34. Perform a Groundwater Recharge Feasibility Study (Action 37 from 2016 plan)				
Action 35. Retrofit Historical Buildings				
Action 36. Heating Centers in High Priority Locations				
Action 37. Cooling Centers in High Priority Locations				
Action 38. Extreme Weather Outreach Strategy				
Action 39. Severe Weather Action Plan				
Action 40. Coordinate with Stakeholder on Proposed Flood Control Project on Magpie Creek				
Action 41. Adopt Additional Floodplain Development Standards				
Action 42. Drainage Projects for Repetitive Loss Properties				
Action 43. Emergency Notification and Evacuation Planning				
Action 44. Historic Magpie Creek				
Action 45. Natomas Internal Drainage Canals/Levees				
Action 46. Drainage Projects from the City's Priority Drainage Project List				
Action 47. Projects Identified in the Combined Sewer System Improvement Plan Update				
Action 48. Easements for Open Land Along Levees				
Action 49. Emergency Management Planning and Levee Security				
Action 50. Flood Fighting Equipment				
Action 51. Flood Management Land Use Planning and Development				
Action 52. Florin Creek Pump at Pomegranate Avenue				
Action 53. Internal Drainage System Improvements				
Action 54. Levee and Structural Flood Management Improvements				

Action Title	Complete	Ongoing	Not Yet Started	In 2026 Update*
Action 55. Master planning to identify facilities needed to prevent 10-year event street flooding and 100-year event structure flooding				
Action 56. Retrofit Pumping Plans with Discharge Monitoring Devices				
Action 57. Risk Communication and NFIP/CRS Projects				
Action 58. Trash Racks and Debris Cages				
Action 59. Multi-Jurisdictional Modeling for Drainage Watersheds Greater than 10 Square Miles				
Action 60. Post-Flood Water Treatment Facility Recovery				
Action 61. Tree Trimming & Debris Removal				
Action 62. Install redundancies and Loop Feeds for Power Lines & Infrastructure				
Action 63. Stabilization of Erosion Hazard Areas				
Action 64. Implement a Fire Education and Information Program				
Action 65. Fuels Reduction on the American River Parkway				
Action 66. Outreach on the Effects of Smoke on Air Quality				
Action 67. Implement 2040 Climate Action and Adaptation Plan				
City of Rancho Cordova				
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan				
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness				
Action 3. Sunrise Blvd Widening Kiefer to Jackson				
Action 4. City of Rancho Cordova Disaster Debris Management Plan				
Action 5. Transportation Interconnectivity				
Action 6. Intergovernmental Agreement between the County of Sacramento and the City of Rancho Cordova				
Action 7. Land Use (Long Range)				
Action 8. Post disaster training for staff				
Action 9. Update/Maintain Emergency Operation Plans (EOPs)				
Action 10. Increase Everbridge Enrollment				
Action 11. Developing and maintaining a database to track community vulnerability				
Action 12. Landscape and Irrigation Requirements/Retro				
Action 13. Landscape Ordinance and Model Water Efficient Landscape Ordinance Implementation				
Action 14. Restrict Impervious Surfaces in Front Yards				
Action 15. Porous pavement and vegetative buffers				
Action 16. Storm Water Pump Station Generator Purchase and Infrastructure Upgrades				
Action 17. SB-5 Urban Level of Flood Protection				

Action Title	Complete	Ongoing	Not Yet Started	In 2026 Update*
Action 18. Channel Vegetation Management and Erosion Control Projects				
Action 19. Adoption of Hydromodification and Low Impact Development (LID) Standards				
Action 20. Implement Projects in the Stormwater Capital Improvement Program Master Plan				
Action 21. Sunrise Blvd. & Monier Circle Drainage Improvements				
Action 22. Roundabouts				
Action 23. Dam Failure Mitigation and Preparedness for Evacuations				
Action 24. Wildfire Weed Reduction and Resiliency				
American River Flood Control District Actions				
Action 1. Arcade Creek Erosion Repair Project				
Action 2. American River Emergency Rock Revetment Preparedness Stockpile				
Action 3. Highway 160 Bridge Gap Levee Access				
Citrus Heights Water District Actions				
Action 1. Implement ASR Technology				
Action 2. Construction of a New Storage Tank				
Action 3. Construction of a New Operations Building				
Cosumnes Community Services District Actions				
Action 1. Drought Mitigation Planning				
Action 2. Enhance the District's Public Education, Awareness, and Outreach Program to Include all Hazards of Concern				
Action 3. Integrate the LHMP into Cosumnes CSD Strategic Plans				
Action 4. Wildfire Staffing				
Action 5. Mutual Aid Agreements				
Action 6. Continue Vegetation Management Program				
Los Rios Community College				
Action 1. Pandemic Response Plan				
Action 2. Emergency Operations Plan Update				
Action 3. COVID-19 Education/Information Program				
Action 4. Installing a Microgrid Project, at the Folsom Lake College, El Dorado Center (EDC) in Placerville, CA				
Action 5. Backup Power for Police Dispatch				
Action 6. Tree Mitigation – Districtwide				
RD 800 Actions				
Action 1. Reclamation District 800 Emergency Levee Repair Project				
RD 1000 Actions				
Action 1. Asset Management Plan Update				
Action 2. Corporation Yard Improvements				

Action Title	Complete	Ongoing	Not Yet Started	In 2026 Update*
Action 3. Waterside Levee Inspection Capability				
Action 4. Pleasant Grove Area Levee Improvements				
Action 5. Plant 1 Emergency Generator Natural Gas Conversion and Mobile Generators for Plants 2, 3 and 5				
Action 6. Plant 8 Improvements				
Action 7. Expanded SCADA System				
Action 8. Update Emergency Operations Plan and Staffing				
Sacramento County Water Agency				
Action 1. Flood Hazard Mitigation				
Action 2. Improve Water Supply Portfolio				
Action 3. Seismic Upgrades				
Sac Metro Fire				
Action 1. Finalization and Implementation of Metro Fire's Community Risk Assessment and Associated Community Risk Reduction Plan				
Action 2. Evaluation and Implementation of Measures Necessary to Mitigate Fire Stations that Would be Directly Affected by Dam Failure				
Action 3. Modernization/Upgrade all District Facilities to Comply with Essential Services Code Requirements				
Action 4. Community Wildfire Protection Plan (CWPP) – Revision and Implementation of Resulting Changes				
Action 5. Relocate the Essential Facilities in the 200 year Floodplain				
Sacramento Area Sanitation District				
Action 1. Develop Climate Change Resiliency Plan				
Action 2. Replace current equipment with touchless technologies				
Action 3. Complete I&I Study and Develop I&I Policy				
Action 4. Regional San Biogeneration Facility				
Action 5. Reduction of Fire Hazard of Regional San Bufferlands				
Action 6. Update GHG Emissions Inventory				
Action 7. Study Telecommute Options and Enhanced Information Technology Needs to Support Workforce				
Sacramento Area Sewer District				
Action 1. Flood Control				
Action 2. Pandemic Planning				
Southgate Recreation and Park District				
Action 1. Drought Mitigation Actions/Drought Contingency Plan				
Action 2. Flood Mitigation Actions/Land Acquisition				
Action 3. Conservation Easements				
Action 4. Multi-jurisdictional Cooperation within Watersheds				
Action 5. Storm Water Management Practices – Implement Storm Water Management Practices as identified in Stormwater Quality Design Manual				

Action Title	Complete	Ongoing	Not Yet Started	In 2026 Update*
Action 6. Severe Weather: Heavy Rains and Storms Mitigation Actions/Tree Management				
Action 7. Integrate Local Hazard Mitigation Plan into District Master Plan				
Action 8. Covid-19 Response Plan				
Twin Rivers School District				
Action 1. Reduce Risks to Property and Life due to Earthquake				
Action 2. Reduce Risk to Flooding of Northern Area Schools				
Action 3. Stormdrain Upgrades/Revise and Update Districtwide Stormwater Prevention Plan				
Action 4. Prevent Loss of Life or Injury due to Extreme Heat				
Action 5. Evacuation for Heavy Rains, Storms, Winds, and ALL Hazards				
Action 6. Trees Trimmed/ Vegetation Removed to Minimize Impact During Fire Season				
BALMD				
Action 1. 2016 Sacramento County Flood Safety Plan (by GEI) and subsequent updating in 2021.				
Action 2. Regional Flood Management Plan Projects				
Action 3. Small Communities Plans – Flood Protection – Structural and Nonstructural Mitigation				
Action 4. 2021 Emergency Operations Plan (EOP) – Currently in development				
RD 3				
Action 1. 2017 and 2019 Storm Event Waterside Erosion Repairs				
Action 2. FSRP Critical Erosion Repair				
Action 3. Steamboat Slough Seepage Repairs				
Action 4. Interior Drainage Improvements				
Action 5. Relief Cut Plan				
Action 6. Implement recommendations in West Walnut Grove Flood Risk Reduction Plan				
Action 7. Addressing Unacceptable Items in the District's USACE Periodic Inspection Report				
RD 341				
Action 1. San Joaquin River Multi-Benefit Project				
RD 349				
Action 1. 2017 and 2019 Storm Event Waterside Erosion Repairs				
Action 2. Interior Drainage Improvements				
Action 3. Addressing Unacceptable Items in the District's USACE Periodic Inspection Report				
Action 4. Relief Cut Plan				
RD 369				
Action 1. Backup Power Project				

Action Title	Complete	Ongoing	Not Yet Started	In 2026 Update*
Action 2. Flood Safety Plan Updates, Training, and Exercises				
Action 3. Small Communities Plans - flood protection - structural and nonstructural mitigation				
RD 551				
Action 1. 2017 and 2019 Storm Event Waterside Erosion Repairs				
Action 2. FSRP Critical Seepage Repair				
Action 3. Addressing Unacceptable Items in the District's USACE Periodic Inspection Report				
Action 4. Interior Drainage Improvements				
Action 5. Implement recommendations in Courtland Flood Risk Reduction Plan				
RD 554				
Action 1. Small Communities Plans – Flood Protection – Structural and Nonstructural Mitigation				
Action 2. Disadvantaged Community Projects and subsequent updating in 2021.				
Action 3. 2016 Sacramento County Flood Safety Plan (by GEI) and subsequent updating in 2021.				
Action 4. 2021 Emergency Operations Plan (EOP) – Currently in development				
Action 5. Regional Flood Management Plan Projects				
RD 556				
Action 1. 2021 Emergency Operations Plan (EOP) – Currently in development				
Action 2. 2016 Sacramento County Flood Safety Plan (by GEI) and subsequent updating in 2021.				
Action 3. Regional Flood Management Plan Projects				
RD 563				
Action 1. Rock Slope Protection Project				
Action 2. Levee Geometry Levee Improvement Project				
Action 3. Levee Failure Repair Project				
Action 4. Levee Seepage Repair Project				
Action 5. Backup Power Generator Project				
Action 6. Flood Exercise and Emergency Operations Plan Update				
RD 1002				
Action 1. Regional Flood Management Plan Projects				
Action 2. 2016 Sacramento County Flood Safety Plan (by GEI) and subsequent updating in 2021.				
Action 3. 2021 Emergency Operations Plan (EOP) – Currently in development				

Action Title	Complete	Ongoing	Not Yet Started	In 2026 Update*
RD 1601				
Action 1. Levee Improvement Project				
Action 2. Rock Slope Protection Project				
Action 3. San Joaquin River Setback Levee				
Action 4. Backup Power Project				
Action 5. Flood Safety Plan Updates, Training, and Exercises				
RD 2111				
Action 1. Rock Slope Protection Project				
Action 2. Levee Improvement Projects				
Action 3. Overflow Weir Project				
Action 4. Syphon Project				
Action 5. Backup Power Project				
Action 6. Flood Safety Plan Updates, Training, and Exercises				

* Actions not carried forward were determined by the jurisdictions to be no longer feasible, relevant, lacked funding and local resources to implement, and/or no longer considered a priority.

**Sacramento County Status as of April 2025 (Source: 2024 Annual Report on LHMP)

Mitigation Strategy: Action (Implementation) Plan

The mitigation action plan describes how the mitigation actions will be implemented, including how those actions will be prioritized, administered, and incorporated into the community's existing planning mechanism. Each participating jurisdiction must have a mitigation action(s) and an action plan specific to that jurisdiction and its priority hazards and vulnerabilities.

Mitigation Criteria

For use in selecting and prioritizing Proposed Mitigation Measures

1. STAPLEE

Social: Does the measure treat people fairly? (different groups, different generations)

- Community Acceptance
- Effect on Segment of Population
- Social Benefits

Technical: Will it work? (Does it solve the problem? Is it feasible?)

- Technical Feasibility
- Reduce Community Risk
- Long Term Solution/Sustainable
- Secondary Impacts

Administrative: Do you have the capacity to implement & manage project?

- Staffing
- Funding Allocated
- Maintenance/Operations

Political: Who are the stakeholders? Did they get to participate? Is there public support? Is political leadership willing to support?

- Political Support
- Local Champion
- Public Support
- Achieves Multiple Objectives
- Supported by a broad array of Stakeholders

Legal: Does your organization have the authority to implement? Is it legal? Are there liability implications?

- Existing Local Authority
- State Authority
- Potential Legal Challenges

Economic: Is it cost-beneficial? Is there funding? Does it contribute to the local economy or economic development?

- Benefit of Action
- Cost of Action
- Cost Effective/Economic Benefits
- Economically Viable
- Outside Funding Required

Environmental: Does it comply with Environmental regulations?

- Effect on Land/Water
- Effect on Endangered Species
- Effect on Cultural Resources
- Effect on Hazmat sites
- Consistent with Community Environmental Goals
- Consistent with Environmental Laws
- Environmental Benefits

2. SUSTAINABLE DISASTER RECOVERY

- Quality of Life
- Social Equity
- Hazard Mitigation
- Economic Development
- Environmental Protection/Enhancement
- Community Participation

3. SMART GROWTH PRINCIPLES

- Infill versus Sprawl
- Efficient Use of Land Resources
- Full Use of Urban Resources
- Mixed Uses of Land
- Transportation Options
- Detailed, Human-Scale Design

4. OTHER

- | | |
|--|---|
| ➤ Does measure address area with highest risk? | ✓ Critical Infrastructure (access, power, water, gas, telecommunications) |
| ➤ Does measure protect ... | |
| ✓ The largest # of people exposed to risk? | ➤ Timing of Available funding |
| ✓ The largest # of buildings? | ➤ Visibility of Project |
| ✓ The largest # of jobs? | ➤ Community Credibility |
| ✓ The largest tax income? | |
| ✓ The largest average annual loss potential? | |
| ✓ The area impacted most frequently? | |

Mitigation Action Prioritization Instructions

The HMPC's brainstormed list of mitigation actions and projects are organized by hazard and posted on flip-chart paper around the room.

You each have 3 sets of colored dots:

- 3 red dots
- 3 blue dots
- 3 green dots

The red dots are for high priority (5 points each)

The blue dots are for medium priority (3 points each)

The green dots are for low priority (1 point each)

Place your dots on any mitigation action/project, using the different colors to indicate your priority. You may use as many of your dots, of any color, on any mitigation action/project --- or you may spread them out using as few of your dots as you wish. The scored dots will indicate the consensus of the HMPC.

Use the list of mitigation selection criteria (above) to help you make your determinations.

Your votes will indicate the consensus of the team.

After the totals are counted, we will discuss them further to confirm or modify any of the results as necessary to best meet the goals of this LHMP Update.

Mitigation Action Worksheet Development Guidance Notes

- **All sections** of the Worksheet must be completed.
- **Mitigation Action/Project Title** – This is up to each person completing the Worksheet.
- **Hazards Addressed** – list all of your priority hazards that will be mitigated by this Action. Note, the Issue/Background and Project Description section must show a linkage to each identified hazard.
- **Issue/Background (Problem Statement)** - Please provide specific, detailed information in the Issue/Background that details the problem/issue/hazard the action is designed to mitigate.
- **Project Description** – Include sufficient detail to describe the proposed action.
- **Other Alternatives** - Make sure you fill out Other Alternatives. No Action is a viable alternative.
- **Existing Planning Mechanisms** – Please provide specific plans, programs, and related mechanisms in any way related to project implementation.
- **Responsible Office/Partners** - Make sure to identify by name the specific County/City/District departments that will be involved in implementation and any external partnering agencies, which should also be included by name.
- **Project Benefits** – Include sufficient details of all project benefits. Consider life safety and property protection benefits, as well as benefits associated with protection of other assets at risk such as natural and cultural resources and key economic assets.
- **Potential Funding** – Be sure to name any/all outside grants and other funding mechanisms by specific name (i.e., can't say FEMA grant, need to also include HMGP, FMA, BRIC, etc). For Local budgets need to also name specific local funds by type (i.e., General Fund, Capital Improvement Program funding, Staff Time, etc.)
- **FYI** - Cost estimates are no longer required.
- **Timeline** – need to have a defined period of time. Use specific timeframes (that also show project duration) such as 1-3 years; Within 1 year and ongoing; 3-5 years; to be initiated within 5 years and ongoing; etc. This is a 5-year plan so primarily focus on timeframes within that time period. Words like: ongoing, annually, continuous CANNOT be used by themselves or will be rejected by FEMA. (i.e, Within 1 year and annually would be acceptable.)
- **Project Priority** – this is up to each person completing the Worksheet.

Sacramento County Mitigation Action Worksheet

Mitigation Action/Project Title:	
Hazards Addressed:	
Issue/Background (Problem Statement):	
Project Description:	
Other Alternatives:	
Existing Planning Mechanism(s) through which Action Will Be Implemented:	
Responsible Office/Partners:	
Project Benefits (Losses Avoided):	
Potential Funding (Local Budgets, Grant Funds, etc. <u>by specific type</u>):	
Timeline:	
Project Priority (High, Medium, Low):	

Worksheet completed by:	
Name and Title:	
Phone:	

Sacramento County 2026 LHMP Update

Mitigation Strategy Meetings – Action Brainstorming and Prioritization

Actions Sorted by Hazards

Agency/ Department	Mitigation Action Title	Hazards Addressed	Votes (Points)
	1. Develop/Enhance Public Education and Outreach program for all hazards (priority and non-priority). Key components include: Multi-agency approach; Multi-media and traditional platforms; Accessibility of all end users; Focus on self-reliance of all community members; Communication enhancements; Disaster prep (go-bags, animal evac resources); and other	Multi-Hazard	N/A
	2. Enhance routine public and private education through participation in regional training events	Multi-Hazard	N/A
	3. Continue to identify AFN communities (underserved and vulnerable populations) to support equity in hazard mitigation	Multi-Hazard	13
	4. Ongoing Evacuation planning & implementation, education, outreach, training, and exercises -increase community education and awareness including routes and signage -evacuation for large events	Multi-Hazard	N/A
	5. Identify and implement continued improvements to the emergency management system(s) that can effectively respond in the event of a disaster	Multi-Hazard	N/A
	6. Communication/Alert & Warning system enhancements for sending out mass communications to the public during hazard events	Multi-Hazard	N/A
	7. Continue to identify, maintain, and publicize emergency shelters and refuge areas, including specialized sheltering considerations for underserved and vulnerable populations	Multi-Hazard	N/A
	8. Establish Community Resilience Hubs	Severe Weather: All	51
	9. Wrap around grant programs for homeowners – all hazards	Multi-Hazard	1
	10. Identify lessons learned from catastrophic disasters in other jurisdictions and address how Sac County is at risk or is addressing lessons learned	Multi-Hazard	N/A
	11. Develop a regional, interagency technical advisory committee to support the integration of best available science and technologies into risk reduction and hazard mitigation measures	Multi-Hazard	N/A
	12. Leverage complementary efforts from regional long-range planning efforts into risk reduction and hazard mitigation measures	Multi-Hazard	N/A
	13. Backup power redundancy projects for critical facilities and infrastructure and key public facilities (e.g., generators, batteries, solar, etc.)	Multi-Hazard	43
	14. Infrastructure / Facility Modernization projects	Multi-Hazard	44

Agency/ Department	Mitigation Action Title	Hazards Addressed	Votes (Points)
	15. Critical facility and infrastructure replacements, improvements, and hardening projects to ensure backup plans and redundancies to minimize utility disruptions, to protect critical infrastructure, and to provide operational continuity during hazard events.	Multi-Hazard	N/A
	16. Assessment and hardening/upgrades of critical transportation facilities and infrastructure: bridges, roads, evacuation routes	Multi-Hazard/ Earthquake	N/A
	17. Increase and maintain community and regional GIS layers and datasets to be used for risk assessments and development of hazard mitigation measures; create online portal and public facing applications	Multi-Hazard	N/A
	18. General Plan Updates to Plan Elements to reflect new hazard goals, policies and implementation measures and AB 2140 compliance	Multi-Hazard	N/A
	19. Invasive/Nuisance Species/Pests management projects	Aquatic Nuisance Species (Plant/Animal)	N/A
	20. Development/Implementation of Climate Plans: i.e., Climate Action Plan, Climate Adaptation Plan, Climate Vulnerability Assessment	Climate Change / Multi-Hazard	67
	21. Implement infrastructure and educational programs to mitigate the impacts of changing hydrology and increasing heat and length of dry months	Climate Change / Multi-Hazard	N/A
	22. Develop a coordinated regional policy framework to drive resilience, improve air quality, protect public health, and sustain regional economic capacity in the context of extreme heat; facilitate coordinated regional investment in economically positive multi-benefit projects, such as building electrification to provide low cost cooling and urban forest expansion	Climate Change / Multi-Hazard	N/A
	23. Continued Coordination, Dam EAP review, planning and exercises w/ Dam owners (i.e., become a “Plan Owner”)	Dam Failure	7
	24. Integrate inundation maps with evacuation planning and maps	Dam Failure	N/A
	25. Continue Folsom dam improvements	Dam Failure / Flood / Levee Failure	2
	26. Real time weather data coordination with NWS	Dam Failure / Flood / Levee Failure	14
	27. Public Education	Dam Failure	6
	28. Projects to create more flood space for dam waters	Dam Failure / Flood / Levee Failure	6
	29. Implement drought projects from CAPs	Drought & Water Shortage / Climate Change	4
	30. Integration of agricultural uses with groundwater sustainability and resilience planning	Drought & Water Shortage / Climate Change	N/A

Agency/ Department	Mitigation Action Title	Hazards Addressed	Votes (Points)
	31. DWR grant program for SB 552 - Drought Task Force and County Drought resiliency Planning and Project Implementation (Short term (i.e, availability and distribution of water during hazard events) and long term planning (such as system enhancements, consolidation, etc.)	Drought & Water Shortage / Climate Change	18
	32. Tree Inventory and Canopy Assessment	Drought & Water Shortage	18
	33. Tree Irrigation	Drought & Water Shortage	10
	34. Water capture projects, linking water supply and systems	Drought & Water Shortage	5
	35. Managed aquifer storage and recharge	Drought & Water Shortage	36
	36. Drought market research and planning	Drought & Water Shortage	3
	37. Wastewater recycling	Drought & Water Shortage	6
	38. Drought Insurance	Drought & Water Shortage	0
	39. Drought tolerant planting	Drought & Water Shortage	30
	40. Groundwater recharge projects	Drought & Water Shortage	N/A
	41. Continue/enhance water conservation program to encourage use reduction	Drought & Water Shortage	N/A
	42. Assessment and hardening/seismic retrofits of critical facilities and infrastructure to EQ to include hospitals, schools, and all other identified critical facilities	Earthquake	N/A
	43. Establish program to identify public and private Un-Reinforced Masonry (URM) and other seismically vulnerable buildings for building preservation, retrofitting, other	Earthquake	N/A
	44. Establish working group to identify, evaluate, and prioritize flood and stormwater issues in county	Flood / Severe Weather: Heavy Rain and Storms	14
	45. Develop, update, and implement stormwater master plans w/ considerations for climate change (i.e., conduct surveys, updated hydrology standards, culvert upgrades, storm drain improvements, storm pumps, stormwater retention capabilities, etc.)	Flood / Severe Weather: Heavy Rain and Storms	79
	46. Flood elevation projects	Flood / Severe Weather: Heavy Rain and Storms	35
	47. Flood proofing projects to emphasize critical facilities	Flood / Severe Weather: Heavy Rain and Storms	11
	48. Updates to Flood Prevention Ordinances	Flood	N/A

Agency/ Department	Mitigation Action Title	Hazards Addressed	Votes (Points)
	49. Adopt ASCE 2424 (flood resistance design and construction)	Flood	3
	50. Regulate, through zoning and other ordinances, land use and development in all areas subject to potential flooding and prohibit urban uses on unprotected flood land (County GP – SA-15)	Flood	N/A
	51. Deny creation of parcels that do not have buildable areas outside the 100-year floodplain, or the 200-year floodplain in areas subject to the Urban Level of Flood Protection, unless otherwise allowed in the floodplain ordinance (County GP – SA-16)	Flood	N/A
	52. Additional flood gauges/monitoring for rivers, streams, and creeks	Flood / Severe Weather: Heavy Rain and Storms	17
	53. Flood recapture projects	Flood / Severe Weather: Heavy Rain and Storms	9
	54. Establish community based flood insurance program	Flood	9
	55. Underground utilities	Flood / Severe Weather: Heavy Rain and Storms	20
	56. Implement general flood control projects	Flood / Severe Weather: Heavy Rain and Storms	68
	57. Raise key roads/highways to include Hwy 16 along Deer Creek from Dillard Rd to Sloughhouse Rd.	Flood / Severe Weather: Heavy Rain and Storms	14
	58. Update hydrology standards to include drainage	Flood / Severe Weather: Heavy Rain and Storms	22
	59. Clean and maintain swells near Eucalyptus trees in Herald	Flood / Severe Weather: Heavy Rain and Storms	3
	60. RD erosion and seepage projects	Flood / Levee Failure/ Severe Weather: Heavy Rain and Storms	24
	61. Infrastructure improvement and repair projects to include mitigation of scour around bridges	Flood / Levee Failure/ Severe Weather: Heavy Rain and Storms	22
	62. Flood gate maintenance and repair projects	Flood / Levee Failure/ Severe Weather: Heavy Rain and Storms	13
	63. Inspect, replace CMPs	Flood / Severe Weather: Heavy Rain and Storms	0

Agency/ Department	Mitigation Action Title	Hazards Addressed	Votes (Points)
	64. Debris removal and clearing (vegetation management) in creeks, drainages, storm basins, and others	Flood/ Severe Weather: Heavy Rain and Storms	N/A
	65. Add new basins and increase capacity of existing stormwater basins to accommodate runoff	Flood/ Severe Weather: Heavy Rain and Storms	N/A
	66. Flood protection projects for bridge scour, bridge replacement projects, and others	Flood/ Severe Weather: Heavy Rain and Storms	N/A
	67. Modify/engineer slopes in areas vulnerable to landslides	Landslide, Mudslide, Debris Flow	N/A
	68. Access Improvement Projects	Levee Failure	4
	69. Levee modernization projects (monitoring, encroachments, other)	Levee Failure	58
	70. Maintain movable bridges in Delta	Levee Failure	14
	71. Continue SAFCA ULOP flood control projects	Levee Failure	38
	72. RDs to continue SWIF framework and project implementation for PL 8499 eligibility	Levee Failure	3
	73. PL-8499 Eligibility and Active status	Levee Failure	14
	74. Implement project in RDs' 5-year plans	Levee Failure	9
	75. Habitat restoration multi-benefit projects	Levee Failure	21
	76. Integrate equity based multi-benefit levee projects	Levee Failure	8
	77. Stability and set back projects	Levee Failure	5
	78. Floodgate maintenance projects	Levee Failure	7
	79. Backup generator projects	Levee Failure	8
	80. Infrastructure/levee penetrating improvement projects	Levee Failure	28
	81. Continued operation and enhancements of cooling/warming centers w/transportation planning	Severe Weather: Extreme Heat/ Extreme Cold and Freeze	3
	82. Shaded Bus Stops	Severe Weather: Extreme Heat	9
	83. Establish a real time monitoring system and program for NWS coordination and severe weather data collection and reporting, and develop/ implement needed mitigation actions	Severe Weather: All	N/A
	84. Urban forest management to include tree planting, maintenance, other	Climate Change / Drought & Water Shortage / Severe Weather: All	25
	85. Hazardous tree trimming/removal	Drought & Water Shortage /Severe Weather: All/ Wildfire	N/A

Agency/ Department	Mitigation Action Title	Hazards Addressed	Votes (Points)
	86. Identify, coordinate, and leverage wildfire mitigation projects to include climate resiliency initiatives	Climate Change / Wildfire	8
	87. Establish clean air centers	Climate Change / Severe Weather: Extreme Heat / Wildfire	27
	88. Continued promotion/establishment of FireWise communities	Wildfire	3
	89. Increase coordination of wildfire entities to explore funding and other opportunities for wildfire mitigation	Wildfire	12
	90. Continue coordination with neighboring wildfire prone jurisdictions	Wildfire	1
	91. Implement a wide range of fuels reduction projects	Wildfire	3
	92. Develop countywide CWPP	Wildfire	3
	93. Implementation of projects included in existing CWPPs	Wildfire	1
	94. Prescribed burn projects	Wildfire	1
	95. Continue to adopt and update building fire codes	Wildfire	3
	96. Defensible space projects w/ public education	Wildfire	7
	97. Home hardening projects w/public education	Wildfire	5
	98. Continue to support County Fire Safe Program	Wildfire	4
	99. Develop and support Fire Safe Councils	Wildfire	5
	100. Sac Sewer to conduct a focused wildfire assessment for District boundaries	Wildfire	1
	101. Eucalyptus tree mitigation (Herald)	Wildfire	1
	102. Ladder fuels reduction projects	Wildfire	7
	103. PPE purchases for smoke and air quality preparedness	Wildfire (smoke and air quality)	9
	104. Purchase and install community air filters in key facilities/ Other air quality projects	Wildfire (smoke and air quality)	7

N/A (Column 4): Actions identified outside of action identification and prioritization process

Actions Sorted by Prioritization (Voting) Results

Agency/ Department	Mitigation Action Title	Hazards Addressed	Votes (Points)
	45. Develop, update, and implement stormwater master plans w/ considerations for climate change (i.e., conduct surveys, updated hydrology standards, culvert upgrades, storm drain improvements, storm pumps, stormwater retention capabilities, etc.)	Flood / Severe Weather: Heavy Rain and Storms	79
	56. Implement general flood control projects	Flood / Severe Weather: Heavy Rain and Storms	68
	20. Development/Implementation of Climate Plans: i.e., Climate Action Plan, Climate Adaptation Plan, Climate Vulnerability Assessment	Climate Change / Multi-Hazard	67
	69. Levee modernization projects (monitoring, encroachments, other)	Levee Failure	58
	8. Establish Community Resilience Hubs	Severe Weather: All	51
	14. Infrastructure / Facility Modernization projects	Multi-Hazard	44
	13. Backup power redundancy projects for critical facilities and infrastructure and key public facilities (e.g., generators, batteries, solar, etc.)	Multi-Hazard	43
	71. Continue SAFCA ULOP flood control projects	Levee Failure	38
	35. Managed aquifer storage and recharge	Drought & Water Shortage	36
	46. Flood elevation projects	Flood / Severe Weather: Heavy Rain and Storms	35
	39. Drought tolerant planting	Drought & Water Shortage	30
	80. Infrastructure/levee penetrating improvement projects	Levee Failure	28
	87. Establish clean air centers	Climate Change / Severe Weather: Extreme Heat / Wildfire	27
	84. Urban forest management to include tree planting, maintenance, other	Climate Change / Drought & Water Shortage / Severe Weather: All	25
	60. RD erosion and seepage projects	Flood / Levee Failure/ Severe Weather: Heavy Rain and Storms	24
	58. Update hydrology standards to include drainage	Flood / Severe Weather: Heavy Rain and Storms	22

Agency/ Department	Mitigation Action Title	Hazards Addressed	Votes (Points)
	61. Infrastructure improvement and repair projects to include mitigation of scour around bridges	Flood / Levee Failure/ Severe Weather: Heavy Rain and Storms	22
	75. Habitat restoration multi-benefit projects	Levee Failure	21
	55. Underground utilities	Flood / Severe Weather: Heavy Rain and Storms	20
	31. DWR grant program for SB 552 - Drought Task Force and County Drought resiliency Planning and Project Implementation (Short term (i.e, availability and distribution of water during hazard events) and long term planning (such as system enhancements, consolidation, etc.)	Drought & Water Shortage / Climate Change	18
	32. Tree Inventory and Canopy Assessment	Drought & Water Shortage	18
	52. Additional flood gauges/monitoring for rivers, streams, and creeks	Flood / Severe Weather: Heavy Rain and Storms	17
	26. Real time weather data coordination with NWS	Dam Failure / Flood / Levee Failure	14
	44. Establish working group to identify, evaluate, and prioritize flood and stormwater issues in county	Flood / Severe Weather: Heavy Rain and Storms	14
	57. Raise key roads/highways to include Hwy 16 along Deer Creek from Dillard Rd to Sloughhouse Rd.	Flood / Severe Weather: Heavy Rain and Storms	14
	70. Maintain movable bridges in Delta	Levee Failure	14
	73. PL-8499 Eligibility and Active status	Levee Failure	14
	3. Continue to identify AFN communities (underserved and vulnerable populations) to support equity in hazard mitigation	Multi-Hazard	13
	62. Flood gate maintenance and repair projects	Flood / Levee Failure/ Severe Weather: Heavy Rain and Storms	13
	89. Increase coordination of wildfire entities to explore funding and other opportunities for wildfire mitigation	Wildfire	12
	47. Flood proofing projects to emphasize critical facilities	Flood / Severe Weather: Heavy Rain and Storms	11
	33. Tree Irrigation	Drought & Water Shortage	10
	53. Flood recapture projects	Flood / Severe Weather: Heavy Rain and Storms	9
	54. Establish community based flood insurance program	Flood	9

Agency/ Department	Mitigation Action Title	Hazards Addressed	Votes (Points)
	74. Implement project in RDs' 5-year plans	Levee Failure	9
	82. Shaded Bus Stops	Severe Weather: Extreme Heat	9
	103. PPE purchases for smoke and air quality preparedness	Wildfire (smoke and air quality)	9
	76. Integrate equity based multi-benefit levee projects	Levee Failure	8
	79. Backup generator projects	Levee Failure	8
	86. Identify, coordinate, and leverage wildfire mitigation projects to include climate resiliency initiatives	Climate Change / Wildfire	8
	23. Continued Coordination, Dam EAP review, planning and exercises w/ Dam owners (i.e., become a "Plan Owner")	Dam Failure	7
	78. Floodgate maintenance projects	Levee Failure	7
	96. Defensible space projects w/ public education	Wildfire	7
	102. Ladder fuels reduction projects	Wildfire	7
	104. Purchase and install community air filters in key facilities/ Other air quality projects	Wildfire (smoke and air quality)	7
	27. Public Education	Dam Failure	6
	28. Projects to create more flood space for dam waters	Dam Failure / Flood / Levee Failure	6
	37. Wastewater recycling	Drought & Water Shortage	6
	34. Water capture projects, linking water supply and systems	Drought & Water Shortage	5
	77. Stability and set back projects	Levee Failure	5
	97. Home hardening projects w/public education	Wildfire	5
	99. Develop and support Fire Safe Councils	Wildfire	5
	29. Implement drought projects from CAPs	Drought & Water Shortage / Climate Change	4
	68. Access Improvement Projects	Levee Failure	4
	98. Continue to support County Fire Safe Program	Wildfire	4
	36. Drought market research and planning	Drought & Water Shortage	3
	49. Adopt ASCE 2424 (flood resistance design and construction)	Flood	3
	59. Clean and maintain swells near Eucalyptus trees in Herald	Flood / Severe Weather: Heavy Rain and Storms	3
	72. RDs to continue SWIF framework and project implementation for PL 8499 eligibility	Levee Failure	3

Agency/ Department	Mitigation Action Title	Hazards Addressed	Votes (Points)
	81. Continued operation and enhancements of cooling/warming centers w/transportation planning	Severe Weather: Extreme Heat/ Extreme Cold and Freeze	3
	88. Continued promotion/establishment of FireWise communities	Wildfire	3
	91. Implement a wide range of fuels reduction projects	Wildfire	3
	92. Develop countywide CWPP	Wildfire	3
	95. Continue to adopt and update building fire codes	Wildfire	3
	25. Continue Folsom dam improvements	Dam Failure / Flood / Levee Failure	2
	9. Wrap around grant programs for homeowners – all hazards	Multi-Hazard	1
	90. Continue coordination with neighboring wildfire prone jurisdictions	Wildfire	1
	93. Implementation of projects included in existing CWPPs	Wildfire	1
	94. Prescribed burn projects	Wildfire	1
	100. Sac Sewer to conduct a focused wildfire assessment for District boundaries	Wildfire	1
	101. Eucalyptus tree mitigation (Herald)	Wildfire	1
	38. Drought Insurance	Drought & Water Shortage	0
	63. Inspect, replace CMPs	Flood / Severe Weather: Heavy Rain and Storms	0
	1. Develop/Enhance Public Education and Outreach program for all hazards (priority and non-priority). Key components include: Multi-agency approach; Multi-media and traditional platforms; Accessibility of all end users; Focus on self-reliance of all community members: Communication enhancements; Disaster prep (go-bags, animal evac resources); and other	Multi-Hazard	N/A
	2. Enhance routine public and private education through participation in regional training events	Multi-Hazard	N/A
	4. Ongoing Evacuation planning & implementation, education, outreach, training, and exercises -increase community education and awareness including routes and signage -evacuation for large events	Multi-Hazard	N/A
	5. Identify and implement continued improvements to the emergency management system(s) that can effectively respond in the event of a disaster	Multi-Hazard	N/A
	6. Communication/Alert & Warning system enhancements for sending out mass communications to the public during hazard events	Multi-Hazard	N/A

Agency/ Department	Mitigation Action Title	Hazards Addressed	Votes (Points)
	7. Continue to identify, maintain, and publicize emergency shelters and refuge areas, including specialized sheltering considerations for underserved and vulnerable populations	Multi-Hazard	N/A
	10. Identify lessons learned from catastrophic disasters in other jurisdictions and address how Sac County is at risk or is addressing lessons learned	Multi-Hazard	N/A
	11. Develop a regional, interagency technical advisory committee to support the integration of best available science and technologies into risk reduction and hazard mitigation measures	Multi-Hazard	N/A
	12. Leverage complementary efforts from regional long-range planning efforts into risk reduction and hazard mitigation measures	Multi-Hazard	N/A
	15. Critical facility and infrastructure replacements, improvements, and hardening projects to ensure backup plans and redundancies to minimize utility disruptions, to protect critical infrastructure, and to provide operational continuity during hazard events.	Multi-Hazard	N/A
	16. Assessment and hardening/upgrades of critical transportation facilities and infrastructure: bridges, roads, evacuation routes	Multi-Hazard/ Earthquake	N/A
	17. Increase and maintain community and regional GIS layers and datasets to be used for risk assessments and development of hazard mitigation measures; create online portal and public facing applications	Multi-Hazard	N/A
	18. General Plan Updates to Plan Elements to reflect new hazard goals, policies and implementation measures and AB 2140 compliance	Multi-Hazard	N/A
	19. Invasive/Nuisance Species/Pests management projects	Aquatic Nuisance Species (Plant/Animal)	N/A
	21. Implement infrastructure and educational programs to mitigate the impacts of changing hydrology and increasing heat and length of dry months	Climate Change / Multi-Hazard	N/A
	22. Develop a coordinated regional policy framework to drive resilience, improve air quality, protect public health, and sustain regional economic capacity in the context of extreme heat; facilitate coordinated regional investment in economically positive multi-benefit projects, such as building electrification to provide low cost cooling and urban forest expansion	Climate Change / Multi-Hazard	N/A
	24. Integrate inundation maps with evacuation planning and maps	Dam Failure	N/A
	30. Integration of agricultural uses with groundwater sustainability and resilience planning	Drought & Water Shortage / Climate Change	N/A
	40. Groundwater recharge projects	Drought & Water Shortage	N/A
	41. Continue/enhance water conservation program to encourage use reduction	Drought & Water Shortage	N/A
	42. Assessment and hardening/seismic retrofits of critical facilities and infrastructure to EQ to include hospitals, schools, and all other identified critical facilities	Earthquake	N/A

Agency/ Department	Mitigation Action Title	Hazards Addressed	Votes (Points)
	43. Establish program to identify public and private Un-Reinforced Masonry (URM) and other seismically vulnerable buildings for building preservation, retrofitting, other	Earthquake	N/A
	48. Updates to Flood Prevention Ordinances	Flood	N/A
	50. Regulate, through zoning and other ordinances, land use and development in all areas subject to potential flooding and prohibit urban uses on unprotected flood land (County GP – SA-15)	Flood	N/A
	51. Deny creation of parcels that do not have buildable areas outside the 100-year floodplain, or the 200-year floodplain in areas subject to the Urban Level of Flood Protection, unless otherwise allowed in the floodplain ordinance (County GP – SA-16)	Flood	N/A
	64. Debris removal and clearing (vegetation management) in creeks, drainages, storm basins, and others	Flood/ Severe Weather: Heavy Rain and Storms	N/A
	65. Add new basins and increase capacity of existing stormwater basins to accommodate runoff	Flood/ Severe Weather: Heavy Rain and Storms	N/A
	66. Flood protection projects for bridge scour, bridge replacement projects, and others	Flood/ Severe Weather: Heavy Rain and Storms	N/A
	67. Modify/engineer slopes in areas vulnerable to landslides	Landslide, Mudslide, Debris Flow	N/A
	83. Establish a real time monitoring system and program for NWS coordination and severe weather data collection and reporting, and develop/ implement needed mitigation actions	Severe Weather: All	N/A
	85. Hazardous tree trimming/removal	Drought & Water Shortage /Severe Weather: All/ Wildfire	N/A

N/A (Column 4): Actions identified outside of action identification and prioritization process

Appendix D Adoption Resolution

Note to Reviewers: When this Plan has been reviewed and approved pending adoption by FEMA Region IX, the adoption resolutions will be executed by each participating jurisdiction and added to this appendix. Two model resolutions are provided below. For Sacramento County and the incorporated communities, this adoption resolution also includes compliance with AB 2140 requiring adoption by reference or incorporation into the Safety Element of the General Plan.

Two resolutions were created – one for the County and incorporated communities and one for the Special Districts and local agencies.

Sample County and Incorporated Community Adoption Resolution

(LOCAL GOVERNMENT: County, Incorporated Communities)

RESOLUTION NO.

A RESOLUTION OF (LOCAL GOVERNMENT) ADOPTING THE (TITLE AND DATE OF MITIGATION PLAN).

WHEREAS the (local governing body) recognizes the threat that natural hazards pose to people and property within (local government); and

WHEREAS the (local government) has prepared a multi-hazard mitigation plan, hereby known as (title and date of mitigation plan) in accordance with federal laws, including the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended; the National Flood Insurance Act of 1968, as amended; and the National Dam Safety Program Act, as amended; and

WHEREAS (title and date of mitigation plan) identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in (local government) from the impacts of future hazards and disasters; and

WHEREAS adoption by the (local governing body) demonstrates its commitment to hazard mitigation and achieving the goals outlined in the (title and date of mitigation plan).

WHEREAS, the (local governing body) seeking FEMA approval of hazard mitigation plan desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts by formally adopting the (title and date of mitigation plan) by reference into the Safety Element of the General Plan in accordance with the requirements of AB 2140; and

NOW THEREFORE, BE IT RESOLVED BY THE (LOCAL GOVERNMENT), (STATE), THAT:

In accordance with (local rule for adopting resolutions), the (local governing body) adopts the (title and date of mitigation plan). While content related to (local government) may require revisions to meet the plan approval requirements, changes occurring after adoption will not require (local government) to re-adopt any further iterations of the plan. Subsequent plan updates following the approval period for this plan will require separate adoption resolutions.

BE IT RESOLVED, that the (Name of Government/District/Organization seeking FEMA approval of hazard mitigation plan) adopts the (title and date of mitigation plan) by reference into the safety element of their general plan in accordance with the requirements of AB 2140; and

BE IT FURTHER RESOLVED, the (local governing body) will submit this adoption resolution to the California Office of Emergency Services and FEMA Region IX officials to enable the plan's final approval in accordance with the requirements of the Disaster Mitigation Act of 2000 and to establish conformance with the requirement of AB 2140.

ADOPTED by a vote of ____ in favor and ____ against, and ____ abstaining, this ____ day of _____, _____.

By: _____ (print name)

ATTEST: By: _____ (print name)

APPROVED AS TO FORM: By: _____ (print name)

Sample Special District Adoption Resolution

(LOCAL GOVERNMENT: Special Districts, Local Agencies)

RESOLUTION NO.

A RESOLUTION OF (LOCAL GOVERNMENT) ADOPTING THE (TITLE AND DATE OF MITIGATION PLAN).

WHEREAS the (local governing body) recognizes the threat that natural hazards pose to people and property within (local government); and

WHEREAS the (local government) has prepared a multi-hazard mitigation plan, hereby known as (title and date of mitigation plan) in accordance with federal laws, including the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended; the National Flood Insurance Act of 1968, as amended; and the National Dam Safety Program Act, as amended; and

WHEREAS (title and date of mitigation plan) identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in (local government) from the impacts of future hazards and disasters; and

WHEREAS adoption by the (local governing body) demonstrates its commitment to hazard mitigation and achieving the goals outlined in the (title and date of mitigation plan).

NOW THEREFORE, BE IT RESOLVED BY THE (LOCAL GOVERNMENT), (STATE), THAT:

In accordance with (local rule for adopting resolutions), the (local governing body) adopts the (title and date of mitigation plan). While content related to (local government) may require revisions to meet the plan approval requirements, changes occurring after adoption will not require (local government) to re-adopt any further iterations of the plan. Subsequent plan updates following the approval period for this plan will require separate adoption resolutions.

BE IT FURTHER RESOLVED, the (local governing body) will submit this adoption resolution to the California Office of Emergency Services and FEMA Region IX officials to enable the plan's final approval in accordance with the requirements of the Disaster Mitigation Act of 2000.

ADOPTED by a vote of ____ in favor and ____ against, and ____ abstaining, this ____ day of _____, _____.

By: _____ (print name)

ATTEST: By: _____ (print name)

APPROVED AS TO FORM: By: _____ (print name)

Appendix E Threatened and Endangered Species

Table E-1 Special Status Species in Sacramento County

Scientific Name	Common Name	Federal Status	State Status	CDFW Status	CA Rare Plant Rank
Animals – Amphibians					
<i>Ambystoma californiense</i>	California tiger salamander	Threatened	Threatened	WL	–
<i>Spea hammondi</i>	western spadefoot	None	None	SSC	–
Animals – Birds					
<i>Accipiter cooperii</i>	Cooper's hawk	None	None	WL	–
<i>Aquila chrysaetos</i>	golden eagle	None	None	FP ; WL	–
<i>Buteo regalis</i>	ferruginous hawk	None	None	WL	–
<i>Buteo swainsoni</i>	Swainson's hawk	None	Threatened	–	–
<i>Circus hudsonius</i>	northern harrier	None	None	SSC	–
<i>Elanus leucurus</i>	white-tailed kite	None	None	FP	–
<i>Haliaeetus leucocephalus</i>	bald eagle	Delisted	Endangered	FP	–
<i>Eremophila alpestris actia</i>	California horned lark	None	None	WL	–
<i>Branta butchinsii leucopareia</i>	cackling (=Aleutian Canada) goose	Delisted	None	WL	–
<i>Chaetura vauxi</i>	Vaux's swift	None	None	SSC	–
<i>Ardea alba</i>	great egret	None	None	–	–
<i>Ardea herodias</i>	great blue heron	None	None	–	–
<i>Botaurus lentiginosus</i>	American bittern	None	None	–	–
<i>Egretta thula</i>	snowy egret	None	None	–	–
<i>Ixobrychus exilis</i>	least bittern	None	None	SSC	–
<i>Nycticorax nycticorax</i>	black-crowned night heron	None	None	–	–
<i>Cardinalis cardinalis</i>	northern cardinal	None	None	WL	–
<i>Charadrius montanus</i>	mountain plover	None	None	SSC	–
<i>Pica nuttalli</i>	yellow-billed magpie	None	None	–	–
<i>Coccyzus americanus occidentalis</i>	western yellow-billed cuckoo	Threatened	Endangered	–	–
<i>Falco columbarius</i>	merlin	None	None	WL	–
<i>Falco mexicanus</i>	prairie falcon	None	None	WL	–
<i>Falco peregrinus anatum</i>	American peregrine falcon	Delisted	Delisted	FP	–
<i>Spinus lawrencei</i>	Lawrence's goldfinch	None	None	–	–
<i>Antigone canadensis canadensis</i>	lesser sandhill crane	None	None	SSC	–
<i>Antigone canadensis tabida</i>	greater sandhill crane	None	Threatened	FP	–
<i>Progne subis</i>	purple martin	None	None	SSC	–

Scientific Name	Common Name	Federal Status	State Status	CDFW Status	CA Rare Plant Rank
<i>Riparia riparia</i>	bank swallow	None	Threatened	–	–
<i>Agelaius tricolor</i>	tricolored blackbird	None	Threatened	SSC	–
<i>Xanthocephalus xanthocephalus</i>	yellow-headed blackbird	None	None	SSC	–
<i>Icteria virens</i>	yellow-breasted chat	None	None	SSC	–
<i>Lanius ludovicianus</i>	loggerhead shrike	None	None	SSC	–
<i>Chlidonias niger</i>	black tern	None	None	SSC	–
<i>Sternula antillarum browni</i>	California least tern	Endangered	Endangered	FP	–
<i>Pandion haliaetus</i>	osprey	None	None	WL	–
<i>Baeolophus inornatus</i>	oak titmouse	None	None	–	–
<i>Geothlypis trichas sinuosa</i>	saltmarsh common yellowthroat	None	None	SSC	–
<i>Setophaga petechia</i>	yellow warbler	None	None	SSC	–
<i>Ammodramus savannarum</i>	grasshopper sparrow	None	None	SSC	–
<i>Melospiza melodia</i>	song sparrow (–inModesto–in population)	None	None	SSC	–
<i>Melospiza melodia maxillaris</i>	Suisun song sparrow	None	None	SSC	–
<i>Spizella breweri</i>	Brewer's sparrow	None	None	–	–
<i>Phalacrocorax auritus</i>	double-crested cormorant	None	None	WL	–
<i>Melanerpes lewis</i>	Lewis' woodpecker	None	None	–	–
<i>Laterallus jamaicensis coturniculus</i>	California black rail	None	Threatened	FP	–
<i>Numenius americanus</i>	long-billed curlew	None	None	WL	–
<i>Asio otus</i>	long-eared owl	None	None	SSC	–
<i>Athene cunicularia</i>	burrowing owl	None	None	SSC	–
<i>Plegadis chihi</i>	white-faced ibis	None	None	WL	–
<i>Selasphorus rufus</i>	rufous hummingbird	None	None	–	–
<i>Empidonax traillii</i>	willow flycatcher	None	Endangered	–	–
<i>Vireo bellii pusillus</i>	least Bell's vireo	Endangered	Endangered	–	–
Animals – Crustaceans					
<i>Branchinecta lynchi</i>	vernal pool fairy shrimp	Threatened	None	–	–
<i>Branchinecta mesovallensis</i>	midvalley fairy shrimp	None	None	–	–
<i>Dumontia oregonensis</i>	hairy water flea	None	None	–	–
<i>Lindieriella occidentalis</i>	California linderiella	None	None	–	–
<i>Lepidurus packardii</i>	vernal pool tadpole shrimp	Endangered	None	–	–
Animals – Fish					
<i>Acipenser medirostris</i>	green sturgeon	Threatened	None	SSC	–
<i>Acipenser transmontanus</i>	white sturgeon	None	None	SSC	–

Scientific Name	Common Name	Federal Status	State Status	CDFW Status	CA Rare Plant Rank
<i>Archoplites interruptus</i>	Sacramento perch	None	None	SSC	–
<i>Cottus gulosus</i>	rifle sculpin	None	None	SSC	–
<i>Lavinia exilicanda exilicanda</i>	Sacramento hitch	None	None	SSC	–
<i>Mylopharodon conocephalus</i>	hardhead	None	None	SSC	–
<i>Pogonichthys macrolepidotus</i>	Sacramento splittail	None	None	SSC	–
<i>Hysteroecarpus traskii traskii</i>	Sacramento–San Joaquin tule perch	None	None	–	–
<i>Hypomesus transpacificus</i>	Delta smelt	Threatened	Endangered	–	–
<i>Spirinchus thaleichthys</i>	longfin smelt	Candidate	Threatened	–	–
<i>Entosphenus tridentatus</i>	Pacific lamprey	None	None	SSC	–
<i>Lampetra ayresii</i>	western river lamprey	None	None	SSC	–
<i>Oncorhynchus mykiss irideus</i> pop. 11	steelhead – Central Valley DPS	Threatened	None	–	–
<i>Oncorhynchus mykiss irideus</i> pop. 8	steelhead – central California coast DPS	Threatened	None	–	–
<i>Oncorhynchus tshawytscha</i> pop. 13	chinook salmon – Central Valley fall / late fall–run ESU	None	None	SSC	–
<i>Oncorhynchus tshawytscha</i> pop. 30	chinook salmon – upper Klamath and Trinity Rivers ESU	Candidate	Candidate Endangered	SSC	–
<i>Oncorhynchus tshawytscha</i> pop. 6	chinook salmon – Central Valley spring–run ESU	Threatened	Threatened	–	–
<i>Oncorhynchus tshawytscha</i> pop. 7	chinook salmon – Sacramento River winter–run ESU	Endangered	Endangered	–	–
Animals – Insects					
<i>Andrena blennospermatis</i>	Blennosperma vernal pool andrenid bee	None	None	–	–
<i>Andrena subapasta</i>	An andrenid bee	None	None	–	–
<i>Anthicus sacramento</i>	Sacramento anthicid beetle	None	None	–	–
<i>Bombus crotchii</i>	Crotch bumble bee	None	Candidate Endangered	–	–
<i>Metapogon hurdi</i>	Hurd's metapogon robberfly	None	None	–	–
<i>Cicindela hirticollis abrupta</i>	Sacramento Valley tiger beetle	None	None	–	–
<i>Desmocerus californicus dimorphus</i>	valley elderberry longhorn beetle	Threatened	None	–	–
<i>Hydrochara rickseckeri</i>	Ricksecker's water scavenger beetle	None	None	–	–
Animals – Mammals					
<i>Vulpes vulpes patwin</i>	Sacramento Valley red fox	None	None	–	–
<i>Reithrodontomys raviventris</i>	salt–marsh harvest mouse	Endangered	Endangered	FP	–

Scientific Name	Common Name	Federal Status	State Status	CDFW Status	CA Rare Plant Rank
<i>Taxidea taxus</i>	American badger	None	None	SSC	–
<i>Antrozous pallidus</i>	pallid bat	None	None	SSC	–
<i>Lasionycteris noctivagans</i>	silver-haired bat	None	None	–	–
<i>Lasiurus blossevillii</i>	western red bat	None	None	SSC	–
<i>Lasiurus cinereus</i>	hoary bat	None	None	–	–
<i>Myotis ciliolabrum</i>	western small-footed myotis	None	None	–	–
<i>Myotis lucifugus</i>	little brown bat	None	None	–	–
<i>Myotis yumanensis</i>	Yuma myotis	None	None	–	–
Animals – Mollusks					
<i>Margaritifera falcata</i>	western pearlshell	None	None	–	–
<i>Gonidea angulata</i>	western ridged mussel	None	None	–	–
Animals – Reptiles					
<i>Emys marmorata</i>	western pond turtle	None	None	SSC	–
<i>Thamnophis gigas</i>	giant gartersnake	Threatened	Threatened	–	–
<i>Phrynosoma blainvillii</i>	coast horned lizard	None	None	SSC	–
Community – Terrestrial					
–	Coastal and Valley Freshwater Marsh	Coastal and Valley Freshwater Marsh	None	None	–
–	Coastal Brackish Marsh	Coastal Brackish Marsh	None	None	–
–	Elderberry Savanna	Elderberry Savanna	None	None	–
–	Great Valley Mixed Riparian Forest	Great Valley Mixed Riparian Forest	None	None	–
–	Great Valley Valley Oak Riparian Forest	Great Valley Valley Oak Riparian Forest	None	None	–
–	Northern Claypan Vernal Pool	Northern Claypan Vernal Pool	None	None	–
–	Northern Hardpan Vernal Pool	Northern Hardpan Vernal Pool	None	None	–
–	Valley Needlegrass Grassland	Valley Needlegrass Grassland	None	None	–
–	Valley Oak Woodland	Valley Oak Woodland	None	None	–

Scientific Name	Common Name	Federal Status	State Status	CDFW Status	CA Rare Plant Rank
Plants – Vascular					
<i>Sagittaria sanfordii</i>	Sanford's arrowhead	None	None	–	1B.2
<i>Cicuta maculata</i> var. <i>bolanderi</i>	Bolander's water–hemlock	None	None	–	2B.1
<i>Eryngium pinnatisectum</i>	Tuolumne button–celery	None	None	–	1B.2
<i>Lilaeopsis masonii</i>	Mason's lilaeopsis	None	Rare	–	1B.1
<i>Centromadia parryi</i> ssp. <i>rudis</i>	Parry's rough tarplant	None	None	–	4.2
<i>Hespererax caulescens</i>	hogwallow starfish	None	None	–	4.2
<i>Lasthenia chrysantha</i>	alkali–sink goldfields	None	None	–	1B.1
<i>Lasthenia ferrisiae</i>	Ferris' goldfields	None	None	–	4.2
<i>Senecio hydrophiloides</i>	sweet marsh ragwort	None	None	–	4.2
<i>Symphyotrichum lentum</i>	Suisun Marsh aster	None	None	–	1B.2
<i>Cryptantha hooveri</i>	Hoover's cryptantha	None	None	–	1A
<i>Lepidium latipes</i> var. <i>beckardii</i>	Heckard's pepper–grass	None	None	–	1B.2
<i>Brasenia schreberi</i>	watershield	None	None	–	2B.3
<i>Downingia pusilla</i>	dwarf downingia	None	None	–	2B.2
<i>Legenere limosa</i>	legenere	None	None	–	1B.1
<i>Extriplex joaquinana</i>	San Joaquin spearscale	None	None	–	1B.2
<i>Cuscuta obtusiflora</i> var. <i>glandulosa</i>	Peruvian dodder	None	None	–	2B.2
<i>Carex comosa</i>	bristly sedge	None	None	–	2B.1
<i>Lathyrus jepsonii</i> var. <i>jepsonii</i>	Delta tule pea	None	None	–	1B.2
<i>Trifolium hydrophilum</i>	saline clover	None	None	–	1B.2
<i>Juncus leiospermus</i> var. <i>abartii</i>	Ahart's dwarf rush	None	None	–	1B.2
<i>Scutellaria galericulata</i>	marsh skullcap	None	None	–	2B.2
<i>Scutellaria lateriflora</i>	side–flowering skullcap	None	None	–	2B.2
<i>Fritillaria agrestis</i>	stinkbells	None	None	–	4.2
<i>Hibiscus lasiocarpus</i> var. <i>occidentalis</i>	woolly rose–mallow	None	None	–	1B.2
<i>Clarkia biloba</i> ssp. <i>brandegeae</i>	Brandegee's clarkia	None	None	–	4.2
<i>Oenothera deltoides</i> ssp. <i>howellii</i>	Antioch Dunes evening–primrose	Endangered	Endangered	–	1B.1
<i>Chloropyron molle</i> ssp. <i>molle</i>	soft salty bird's–beak	Endangered	Rare	–	1B.2
<i>Gratiola heterosepala</i>	Boggs Lake hedge–hyssop	None	Endangered	–	1B.2
<i>Orcuttia tenuis</i>	slender Orcutt grass	Threatened	Endangered	–	1B.1
<i>Orcuttia viscida</i>	Sacramento Orcutt grass	Endangered	Endangered	–	1B.1
<i>Navarretia eriocephala</i>	hoary navarretia	None	None	–	4.3
<i>Navarretia myersii</i> ssp. <i>myersii</i>	pincushion navarretia	None	None	–	1B.1

Scientific Name	Common Name	Federal Status	State Status	CDFW Status	CA Rare Plant Rank
<i>Ranunculus lobbii</i>	Lobb's aquatic buttercup	None	None	–	4.2
<i>Limosella australis</i>	Delta mudwort	None	None	–	2B.1
<i>Brodiaea rosea ssp. vallicola</i>	valley brodiaea	None	None	–	4.2

Source: California Natural Diversity Database BIOS Viewer Tool

Federal Status

Endangered: The classification provided to an animal or plant in danger of extinction within the foreseeable future throughout all or a significant portion of its range.

Threatened: The classification provided to an animal or plant which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Proposed Endangered: The classification provided to an animal or plant that is proposed for federal listing as Endangered in the Federal Register under Section 4 of the Endangered Species Act.

Proposed Threatened: The classification provided to an animal or plant that is proposed for federal listing as Threatened in the Federal Register under Section 4 of the Endangered Species Act.

Candidate: The classification provided to an animal or plant that has been studied by the United States Fish and Wildlife Service, and the Service has concluded that it should be proposed for addition to the Federal Endangered and Threatened species list.

None: The plant or animal has no federal status.

Delisted: The plant or animal was previously listed as Endangered or Threatened, but is no longer listed on the Federal Endangered and Threatened species list.

CDFW Status

FP: Fully Protected: This classification was the State of California's initial effort to identify and provide additional protection to those animals that were rare or faced possible extinction.

SSC: Species of Special Concern: To this end, the Department has designated certain vertebrate species as "Species of Special Concern" because declining population levels, limited ranges, and/or continuing threats have made them vulnerable to extinction. The goal of designating species as "Species of Special Concern" is to halt or reverse their decline by calling attention to their plight and addressing the issues of concern early enough to secure their long-term viability.

WL: Watch List: Species that were previously designated as "Species of Special Concern" but no longer merit that status, or which do not yet meet SSC criteria, but for which there is concern and a need for additional information to clarify status.

CA Rare Plant Rank

1A: Plants presumed extinct in California and rare/extinct elsewhere

1B.1: Plants rare, threatened, or endangered in California and elsewhere; seriously threatened in California

1B.2: Plants rare, threatened, or endangered in California and elsewhere; fairly threatened in California

1B.3: Plants rare, threatened, or endangered in California and elsewhere; not very threatened in California

2A: Plants presumed extirpated in California, but more common elsewhere

2B.1: Plants rare, threatened, or endangered in California, but more common elsewhere; seriously threatened in California

2B.2: Plants rare, threatened, or endangered in California, but more common elsewhere; fairly threatened in California

2B.3: Plants rare, threatened, or endangered in California, but more common elsewhere; not very threatened in California

3.1: Plants about which we need more information; seriously threatened in California

3.2: Plants about which we need more information; fairly threatened in California

3.3: Plants about which we need more information; not very threatened in California

4.1: Plants of limited distribution; seriously threatened in California

4.2: Plants of limited distribution; fairly threatened in California

4.3: Plants of limited distribution; not very threatened in California



Appendix F Public Survey

INSERT WHEN COMPLETE

Appendix G FEMA National Risk Index Report

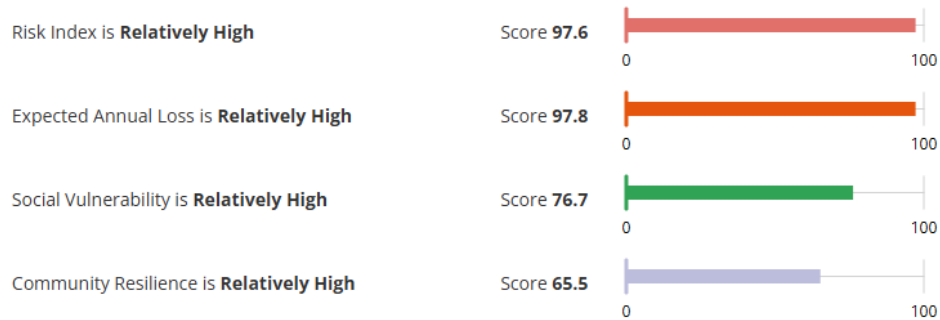
National Risk Index



October 08, 2025

Sacramento County, California

Summary

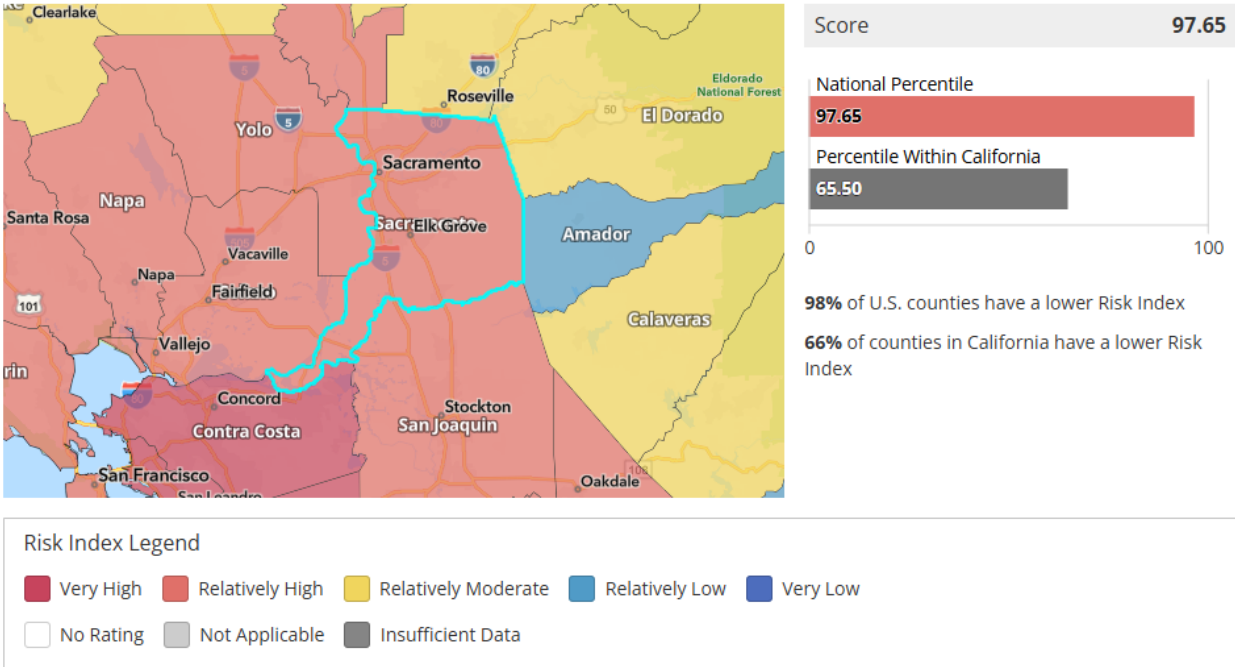


While reviewing this report, keep in mind that low risk is driven by lower loss due to natural hazards, lower social vulnerability, and higher community resilience.

For more information about the National Risk Index, its data, and how to interpret the information it provides, please review the **About the National Risk Index** and **How to Take Action** sections at the end of this report. Or, visit the National Risk Index website at hazards.fema.gov/nri/learn-more to access supporting documentation and links.

Risk Index

The Risk Index rating is **Relatively High** for **Sacramento County, CA** when compared to the rest of the U.S.



Hazard Type Risk Index

Hazard type Risk Index scores are calculated using data for only a single hazard type, and reflect a community's Expected Annual Loss value, community risk factors, and the adjustment factor used to calculate the risk value.

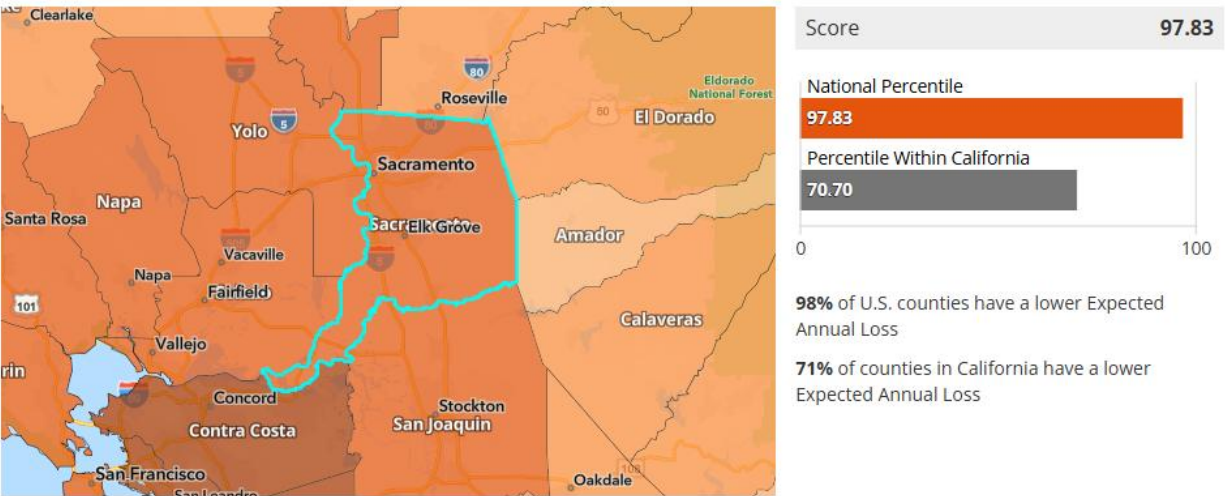
Hazard Type	Risk Index Rating	Risk Index Score	National Percentile
Avalanche	Not Applicable	--	
Coastal Flooding	No Rating	0	0 100
Cold Wave	No Rating	0	0 100
Drought	Very High	99.7	0 100
Earthquake	Relatively High	99	0 100
Hail	Very Low	17.8	0 100
Heat Wave	Relatively High	99.2	0 100
Hurricane	Not Applicable	--	
Ice Storm	Not Applicable	--	
Landslide	Relatively Moderate	91.3	0 100
Lightning	Very Low	27	0 100
Riverine Flooding	Relatively Moderate	75.4	0 100
Strong Wind	Very Low	1.7	0 100
Tornado	Relatively Low	69.6	0 100
Tsunami	No Rating	0	0 100
Volcanic Activity	Not Applicable	--	
Wildfire	Relatively Moderate	93	0 100
Winter Weather	Very Low	11.5	0 100

Risk Factor Breakdown

Hazard Type	EAL Value	Social Vulnerability	Community Resilience	CRF	Risk Value	Risk Index Score
Earthquake	\$104,969,015	Relatively High	Relatively High	1.22	\$132,338,618	99
Drought	\$48,062,172	Relatively High	Relatively High	1.22	\$54,251,987	99.7
Heat Wave	\$12,434,271	Relatively High	Relatively High	1.22	\$15,543,423	99.2
Wildfire	\$2,892,735	Relatively High	Relatively High	1.22	\$2,790,239	93
Tornado	\$1,918,373	Relatively High	Relatively High	1.22	\$2,357,694	69.6
Riverine Flooding	\$1,295,253	Relatively High	Relatively High	1.22	\$1,487,221	75.4
Landslide	\$169,504	Relatively High	Relatively High	1.22	\$185,175	91.3
Lightning	\$41,782	Relatively High	Relatively High	1.22	\$51,356	27
Hail	\$17,250	Relatively High	Relatively High	1.22	\$20,071	17.8
Winter Weather	\$6,176	Relatively High	Relatively High	1.22	\$7,707	11.5
Strong Wind	\$3,567	Relatively High	Relatively High	1.22	\$4,304	1.7
Coastal Flooding	\$0	Relatively High	Relatively High	1.22	\$0	0
Cold Wave	\$0	Relatively High	Relatively High	1.22	\$0	0
Tsunami	\$0	Relatively High	Relatively High	1.22	\$0	0
Avalanche	--	Relatively High	Relatively High	1.22	--	--
Hurricane	--	Relatively High	Relatively High	1.22	--	--
Ice Storm	--	Relatively High	Relatively High	1.22	--	--
Volcanic Activity	--	Relatively High	Relatively High	1.22	--	--

Expected Annual Loss

In **Sacramento County, CA**, expected loss each year due to natural hazards is **Relatively High** when compared to the rest of the U.S.



Expected Annual Loss Legend

Very High Relatively High Relatively Moderate Relatively Low Very Low

No Expected Annual Losses Not Applicable Insufficient Data

Composite Expected Annual Loss		\$171,810,097.70	
Composite Expected Annual Loss Rate National Percentile		37	
Building EAL	\$89,204,829.22	Population EAL	2.96 fatalities
Building EAL Rate	\$1 per \$2.96K of building value	Population EAL Rate	1 per 535.07K people
Agriculture EAL	\$48,251,123.56	Population Equivalence EAL	\$34,354,144.93
Agriculture EAL Rate	\$1 per \$10.23 of agriculture value		

Expected Annual Loss for Hazard Types

Expected Annual Loss scores for hazard types are calculated using data for only a single hazard type, and reflect a community's relative expected annual loss for only that hazard type.

14 of 18 hazard types contribute to the expected annual loss for **Sacramento County, CA**.

Hazard Type	Expected Annual Loss Rating	EAL Value	Score
Earthquake	Relatively High	\$104,969,015	99.0
Drought	Very High	\$48,062,172	99.8
Heat Wave	Relatively High	\$12,434,271	99.3
Wildfire	Relatively Moderate	\$2,892,735	94.1
Tornado	Relatively Moderate	\$1,918,373	69.2
Riverine Flooding	Relatively Moderate	\$1,295,253	75.8
Landslide	Relatively Moderate	\$169,504	91.9
Lightning	Relatively Low	\$41,782	26.5
Hail	Very Low	\$17,250	20.2
Winter Weather	Very Low	\$6,177	13.3
Strong Wind	Very Low	\$3,567	4.2
Coastal Flooding	No Expected Annual Losses	\$0	0.0
Cold Wave	No Expected Annual Losses	\$0	0.0
Tsunami	No Expected Annual Losses	\$0	0.0
Avalanche	Not Applicable	--	--
Hurricane	Not Applicable	--	--
Ice Storm	Not Applicable	--	--
Volcanic Activity	Not Applicable	--	--

Expected Annual Loss Values

Hazard Type	Total	Building Value	Population Equivalence	Population	Agriculture Value
Avalanche	--	--	--	--	--
Coastal Flooding	\$0	\$0	\$0	0.00	n/a
Cold Wave	\$0	\$0	\$0	0.00	\$0
Drought	\$48,062,172	n/a	n/a	n/a	\$48,062,172
Earthquake	\$104,969,015	\$83,852,388	\$21,116,627	1.82	n/a
Hail	\$17,250	\$5,501	\$4,574	0.00	\$7,175
Heat Wave	\$12,434,271	\$207	\$12,312,104	1.06	\$121,960
Hurricane	--	--	--	--	--
Ice Storm	--	--	--	--	--
Landslide	\$169,504	\$143,345	\$26,159	0.00	n/a
Lightning	\$41,782	\$13,049	\$28,733	0.00	n/a
Riverine Flooding	\$1,295,253	\$793,788	\$442,914	0.04	\$58,551
Strong Wind	\$3,567	\$3,212	\$350	0.00	\$5
Tornado	\$1,918,373	\$1,500,920	\$416,193	0.04	\$1,261
Tsunami	\$0	\$0	\$0	0.00	n/a
Volcanic Activity	--	--	--	--	--
Wildfire	\$2,892,735	\$2,891,853	\$882	0.00	\$0
Winter Weather	\$6,176	\$566	\$5,611	0.00	\$0

Exposure Values

Hazard Type	Total	Building Value	Population Equivalence	Population	Agriculture Value
Avalanche	--	--	--	--	--
Coastal Flooding	\$0	\$0	\$0	0.00	n/a
Cold Wave	\$0	\$0	\$0	0.00	\$0
Drought	\$318,519,801	n/a	n/a	n/a	\$318,519,801
Earthquake	\$18,650,361,501,000	\$263,723,501,000	\$18,386,638,000,000	1,585,055.00	n/a
Hail	\$18,646,183,819,449	\$263,726,910,564	\$18,381,963,200,000	1,584,652.00	\$493,708,885
Heat Wave	\$18,646,183,819,448	\$263,726,910,564	\$18,381,963,200,000	1,584,652.00	\$493,708,884
Hurricane	--	--	--	--	--
Ice Storm	--	--	--	--	--
Landslide	\$744,034,861,428	\$15,511,022,887	\$728,523,838,540	62,803.78	n/a
Lightning	\$18,645,690,110,564	\$263,726,910,564	\$18,381,963,200,000	1,584,652.00	n/a
Riverine Flooding	\$1,669,035,153,635	\$24,493,092,454	\$1,644,223,372,878	141,743.39	\$318,688,303
Strong Wind	\$18,646,183,819,449	\$263,726,910,564	\$18,381,963,200,000	1,584,652.00	\$493,708,885
Tornado	\$18,646,183,819,449	\$263,726,910,564	\$18,381,963,200,000	1,584,652.00	\$493,708,885
Tsunami	\$0	\$0	\$0	0.00	n/a
Volcanic Activity	--	--	--	--	--
Wildfire	\$169,863,232,338	\$3,243,205,058	\$166,600,240,291	14,362.09	\$19,786,988
Winter Weather	\$18,646,097,037,780	\$263,726,195,561	\$18,381,877,133,336	1,584,644.58	\$493,708,884

Annualized Frequency Values

Hazard Type	Annualized Frequency	Events on Record	Period of Record
Avalanche	--	--	--
Coastal Flooding	0 events per year	n/a	Various (see documentation)
Cold Wave	0 events per year	0	2005-2021 (16 years)
Drought	55.3 events per year	1,414	2000-2021 (22 years)
Earthquake	0.654% chance per year	n/a	2021 dataset
Hail	0.1 events per year	3	1986-2021 (34 years)
Heat Wave	2.3 events per year	37	2005-2021 (16 years)
Hurricane	--	--	--
Ice Storm	--	--	--
Landslide	0 events per year	2	2010-2021 (12 years)
Lightning	0.9 events per year	21	1991-2012 (22 years)
Riverine Flooding	1.5 events per year	36	1996-2019 (24 years)
Strong Wind	0 events per year	1	1986-2021 (34 years)
Tornado	0.1 events per year	14	1950-2021 (72 years)
Tsunami	0 events per year	2	1800-2021 (222 years)
Volcanic Activity	--	--	--
Wildfire	0.254% chance per year	n/a	2021 dataset
Winter Weather	0.1 events per year	1	2005-2021 (16 years)

Historic Loss Ratios

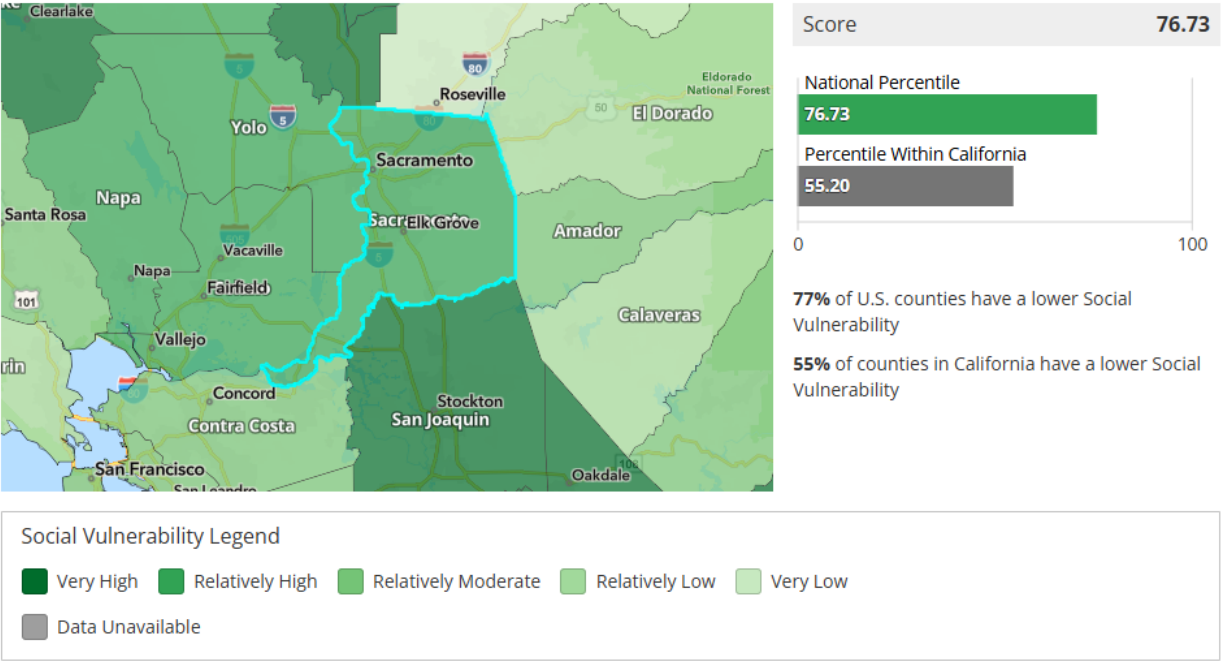
Hazard Type	Overall Rating
Avalanche	--
Coastal Flooding	No Rating
Cold Wave	No Rating
Drought	Relatively High
Earthquake	Relatively Low
Hail	Very Low
Heat Wave	Very Low
Hurricane	--
Ice Storm	--
Landslide	Very Low
Lightning	Very Low
Riverine Flooding	Very Low
Strong Wind	Very Low
Tornado	Very Low
Tsunami	No Rating
Volcanic Activity	--
Wildfire	Relatively Low
Winter Weather	Very Low

Expected Annual Loss Rate

Hazard Type	Building EAL Rate (per building value)	Population EAL Rate (per population)	Agriculture EAL Rate (per agriculture value)
Avalanche	--	--	--
Coastal Flooding	--	--	--
Cold Wave	--	--	--
Drought	--	--	\$1 per \$10.27
Earthquake	\$1 per \$3.15K	1 per 870.50K	--
Hail	\$1 per \$47.94M	1 per 4.02B	\$1 per \$68.81K
Heat Wave	\$1 per \$1.27B	1 per 1.49M	\$1 per \$4.05K
Hurricane	--	--	--
Ice Storm	--	--	--
Landslide	\$1 per \$1.84M	1 per 702.71M	--
Lightning	\$1 per \$20.21M	1 per 639.75M	--
Riverine Flooding	\$1 per \$332.24K	1 per 41.50M	\$1 per \$8.43K
Strong Wind	\$1 per \$82.11M	1 per 52.49B	\$1 per \$96.43M
Tornado	\$1 per \$175.71K	1 per 44.17M	\$1 per \$391.66K
Tsunami	--	--	--
Volcanic Activity	--	--	--
Wildfire	\$1 per \$91.20K	1 per 20.84B	\$1 per \$10.12B
Winter Weather	\$1 per \$465.99M	1 per 3.28B	\$1 per \$5.93T

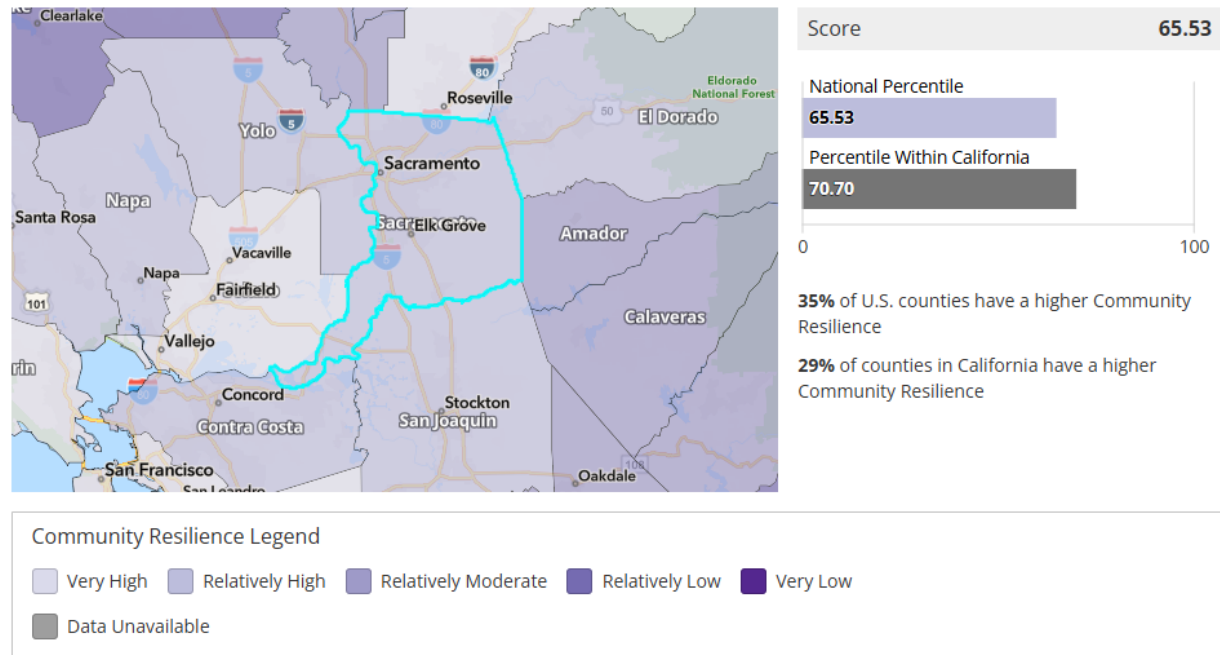
Social Vulnerability

Social groups in **Sacramento County, CA** have a **Relatively High** susceptibility to the adverse impacts of natural hazards when compared to the rest of the U.S.



Community Resilience

Communities in **Sacramento County, CA** have a **Relatively High** ability to prepare for anticipated natural hazards, adapt to changing conditions, and withstand and recover rapidly from disruptions when compared to the rest of the U.S.



About the National Risk Index

The National Risk Index is a dataset and online tool to help illustrate the United States communities most at risk for 18 natural hazards: Avalanche, Coastal Flooding, Cold Wave, Drought, Earthquake, Hail, Heat Wave, Hurricane, Ice Storm, Landslide, Lightning, Riverine Flooding, Strong Wind, Tornado, Tsunami, Volcanic Activity, Wildfire, and Winter Weather.

The National Risk Index leverages available source data for Expected Annual Loss due to these 18 hazard types, Social Vulnerability, and Community Resilience to develop a baseline relative risk measurement for each United States county and Census tract. These measurements are calculated using average past conditions, but they cannot be used to predict future outcomes for a community. The National Risk Index is intended to fill gaps in available data and analyses to better inform federal, state, local, tribal, and territorial decision makers as they develop risk reduction strategies.

Explore the National Risk Index Map at hazards.fema.gov/nri/map.

Visit the National Risk Index website at hazards.fema.gov/nri/learn-more to access supporting documentation and links.

Calculating the Risk Index

Risk Index scores are calculated using an equation that combines scores for Expected Annual Loss due to natural hazards, Social Vulnerability and Community Resilience:

$$\text{Risk Index} = \text{Expected Annual Loss} \times \text{Social Vulnerability} + \text{Community Resilience}$$

Risk Index scores are presented as a composite score for all 18 hazard types, as well as individual scores for each hazard type.

For more information, visit hazards.fema.gov/nri/determining-risk.

Calculating Expected Annual Loss

Expected Annual Loss scores are calculated using an equation that combines values for exposure, annualized frequency, and historic loss ratios for 18 hazard types:

$$\text{Expected Annual Loss} = \text{Exposure} \times \text{Annualized Frequency} \times \text{Historic Loss Ratio}$$

Expected Annual Loss scores are presented as a composite score for all 18 hazard types, as well as individual scores for each hazard type.

For more information, visit hazards.fema.gov/nri/expected-annual-loss.

Calculating Social Vulnerability

Social Vulnerability is measured using the Social Vulnerability Index (SVI) published by the Centers for Disease Control and Prevention (CDC).

For more information, visit hazards.fema.gov/nri/social-vulnerability.

Calculating Community Resilience

Community Resilience is measured using the Baseline Resilience Indicators for Communities (HVRI BRIC) published by the University of South Carolina's Hazards and Vulnerability Research Institute (HVRI).

For more information, visit hazards.fema.gov/nri/community-resilience.

How to Take Action

There are many ways to reduce natural hazard risk through mitigation. Communities with high National Risk Index scores can take action to reduce risk by decreasing Expected Annual Loss due to natural hazards, decreasing Social Vulnerability, and increasing Community Resilience.

For information about how to take action and reduce your risk, visit hazards.fema.gov/nri/take-action.

Disclaimer

The National Risk Index (the Risk Index or the Index) and its associated data are meant for planning purposes only. This tool was created for broad nationwide comparisons and is not a substitute for localized risk assessment analysis. Nationwide datasets used as inputs for the National Risk Index are, in many cases, not as accurate as available local data. Users with access to local data for each National Risk Index risk factor should consider substituting the Risk Index data with local data to recalculate a more accurate risk index. If you decide to download the National Risk Index data and substitute it with local data, you assume responsibility for the accuracy of the data and any resulting data index. Please visit the [Contact Us](#) page if you would like to discuss this process further.

The methodology used by the National Risk Index has been reviewed by subject matter experts in the fields of natural hazard risk research, risk analysis, mitigation planning, and emergency management. The processing methods used to create the National Risk Index have produced results similar to those from other natural hazard risk analyses conducted on a smaller scale. The breadth and combination of geographic information systems (GIS) and data processing techniques leveraged by the National Risk Index enable it to incorporate multiple hazard types and risk factors, manage its nationwide scope, and capture what might have been missed using other methods.

The National Risk Index does not consider the intricate economic and physical interdependencies that exist across geographic regions. Keep in mind that hazard impacts in surrounding counties or Census tracts can cause indirect losses in your community regardless of your community's risk profile.

Nationwide data available for some risk factors are rudimentary at this time. The National Risk Index will be continuously updated as new data become available and improved methodologies are identified.

The National Risk Index Contact Us page is available at hazards.fema.gov/nri/contact-us.

Appendix H Hazus Reports

The following pages contain the full Hazus scenario reports for the four Hazus earthquake runs:

- Calaveras Fault 6.86 Hazus Scenario
- Concord and Green Valley Fault 6.80 Hazus Scenario
- Hayward and Rogers Creek 7.58 Hazus Scenario
- San Andreas 8.04 Hazus Scenario

Appendix I FIS Flood Events

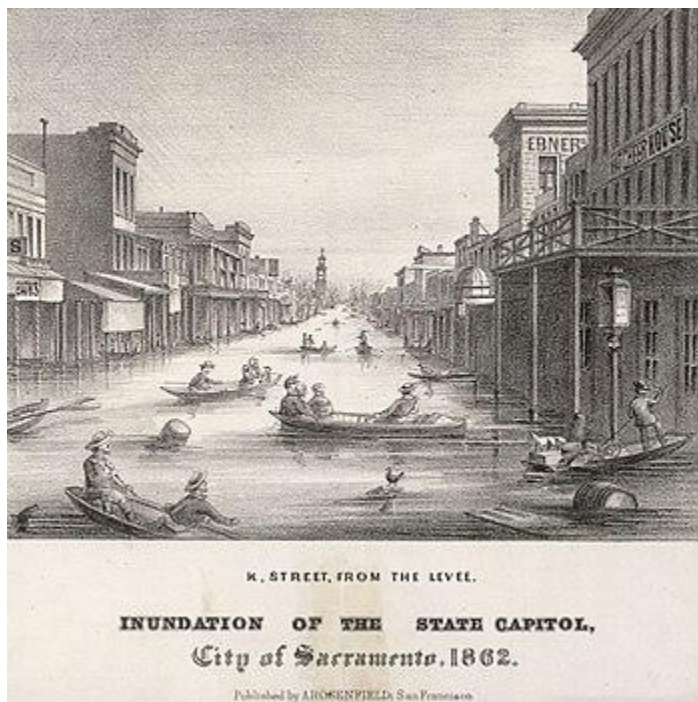
I.1 Flood Events

The latest Flood Insurance Study for Sacramento County was released in February of 2024. The following past events are sourced from the FIS.

In urbanizing areas, flood problems are intensified because rooftops of homes and other structures, streets, driveways, parking lots, and other paved areas all decrease the amount of open land available to absorb rainfall and runoff, thus increasing the volume of water that must be carried away by streams. As indicated earlier, the northern portion of the County is urbanizing at a fairly rapid rate.

Native American legends and historical records indicate that at least nine major floods occurred in the Sacramento River basin during the 19th century. A great flood (described in Native American legend as having swamped the entire Sacramento River basin) occurred in 1805. Indians also described floods that occurred in 1825 and 1826 as widespread in the basin. Extensive flooding in northern California took place in 1839, 1840, 1847, 1849-1850, 1852, 1861-1862, 1881, and 1890. The flood of 1861-1862 was the largest known flood in Sacramento County.

Figure I-1 1862 Flooding



Source: Great Flood of 1862 (Wikipedia.org)

One of the earliest reports of flooding in Sacramento County was the graphic account of Professor William H. Brewer of Yale University, who described the floods of January-March 1862 in the Sacramento area:

“Nearly every house and farm over this immense region is gone. There is such a body of water-250 to 300 miles long and 20 to 60 miles wide, the water ice cold and muddy--that the winds high waves which beat the farmhouses in pieces... The new Capitol is far out in the water—the Governor’s house stands as in a lake—churches, public buildings, private buildings, everything is wet or in water. Not a road leading from the city is passable, business is at a dead standstill,”

Substantial flooding in the County also occurred in 1928, 1937, 1938, 1940, 1943, 1945, 1950, 1952, 1955, 1956, 1958, 1962, 1963, 1964-1965, 1967 and 1969, 1972, 1980, 1982, 1983 and 1997. Newspaper accounts, rainfall and stream gage records and previous studies, indicate that the City of Sacramento has experienced significant flooding in 1928, 1950, 1962, 1967, 1986 and 1997.

Moderate agricultural damages estimated at \$104,000 were caused by the 1966-67 flooding, even though more acres were flooded (approximately 8,070 acres), particularly on Laguna Creek which again overflowed into its floodplain, than during the flooding of 1963 and 1964.

The majority of flooding in January 1969, occurred on agricultural lands in the City of Sacramento, predominantly on lands that lay west of the Union Pacific Railroad (UPRR) tracks in the Beach-Stone Lakes area. Minor flood losses (principally to farmland, crops, and improvements) were incurred east of the UPRR tracks. Floodwaters covered approximately 10,500 acres, and damages were estimated at \$159,000.

In February 1986 a vigorous low pressure system drifted east out of the Pacific, creating a Pineapple Express that lasted through February 24 and unleashed unprecedented amounts of rain on northern California. In Sacramento, nearly 10 inches of rain fell in an 11-day period. The overwhelming floodwaters tore bridges from their foundations and punched through levees. The Northern California flood resulted in 13 deaths, 50,000 people evacuated and over \$400 million in property damage.

In 1995, heavy rains hit the Sacramento area causing wide-spread localized flooding, in particular in the Arcade, Morrison, Florin, Union and Dry Creeks.

Two years later in 1997, a series of tropical storms hit the valley, causing the Cosumnes River to crash through levees in 24 places. Most recently, the 2005/2006 event earned the name “New Year’s Eve Storm” because it soaked the region and caused widespread, localized flooding during the first days on New Year’s Eve 2005 through the first few days of 2006. And although this flood event was not of the magnitude of those in the past, it did cause residents to be vigilant and question their individual storm readiness (Storm Ready, 2015). Newspaper accounts, rainfall and stream gage records and previous studies, indicate that the City of Sacramento has experienced significant flooding in 1928, 1950, 1962, 1967, 1986 and 1997.

Detailed flood damage surveys were not conducted after the 1973, 1983, 1986 and 1997 floods. However, it is estimated that approximately \$500,000 in damages occurred in 1983. Only negligible damages occurred during the February 1986 flood. Peak flows in the last ten years may have been higher partly because of channel improvement work, enlarged channel capacity, and levee construction by local interests in that period.

The severity of flooding on all the streams studied during the July 6, 1998, restudy in the City of Sacramento, is intensified by backwater conditions between stream systems. Floodwater elevations are increased in the lower portions of tributary streams due to the backwater effect from main streams reducing

hydraulic gradients and flow-storage areas. During this time, there will be a high degree of coincidental 1-percent annual chance flood flows on all the study area waterways.

The high flow of floodwaters on some channels within the City of Sacramento has a great impact (causing backwater conditions) on the hydraulic regimen of other channels. High flows on the Sacramento River generate backwater conditions on the lower reaches of the American River and the Cross Canal. The American River peak 1-percent annual chance flows induce backwater conditions in the lower reach of the Natomas East Main Drainage Canal. Coincidentally, high flows on the Natomas East Main Drainage Canal cause backwater conditions on the lower reaches of Arcade and Dry Creeks.

American River Stream Group Flooding

The FIS reviewed flood problems in the American River Stream Group. This consists of American River, Arcade Creek, Brooktree Creek, Carmichael Creek, Chicken Ranch Slough, Coyle Creek, Cripple Creek, Dry Creek, Dry Creek (near Galt), Hinkle Creek, Humbug Creek, Linda Creek, Linda Creek (South Branch), Lower Magpie Creek, Magpie Creek, Magpie Creek Diversion, Mariposa Creek, Natomas East Main Drainage Canal, Natomas East Main Drainage Canal Tributary F, Natomas East Main Drainage Canal Tributary G, Natomas East Main Drainage Canal Tributary I, and Robla Creek.

The American River near the City of Sacramento overflowed in 1928, causing extensive flooding in the River Park and Industrial Park areas on the south bank. In 1950, the American River inundated extensive areas on the north bank, including the area in the vicinity of Fulton Avenue and Fair Oaks Boulevard.

Floods on Dry Creek (American River Stream Group) have occurred with regularity since 1937. Flooding also occurred on Dry and Robla Creeks near the Natomas East Main Drainage Canal. **The October 1962** floods on Dry and Robla Creeks spread from approximately 800 feet to approximately 1 mile wide. The flood of October 1962, was the largest that has been recorded at the Roseville gaging station, located on Dry Creek upstream of Sacramento County. Damage in the October 1962 flood was on the order of approximately \$50,000. The resultant high water was within 2 feet of the top of the levee on the southern side of Robla Creek and along the Magpie Creek diversion channel. Floodwaters from Magpie Creek bypassed the upper portion of the diversion levee and flowed into lower Magpie Creek. Similar, less-severe floods, occurred in 1955, 1958, February 1962, 1967, 1969, 1970 and 1973.

Other creeks in the American River Stream Group have floodplain boundaries similar to that of Dry Creek. The largest flood on Arcade and Cripple Creeks occurred in October 1962, with resulting damages of approximately \$10,000.

The largest recent floods on Strong Ranch and Chicken Ranch Sloughs occurred in February 1962. No damage estimates are available; however, runoff was too large for the channels and bridges, resulting in local flooding. The capacity of the American River pumping plant was exceeded for a short time, and floodwaters backed up and inundated areas in the vicinity of the nearby sewage treatment plant.

The most recent flooding on the American River occurred in February 1986. The peak flow during this flood has been estimated to exceed the current 1-percent annual chance flood peak of 115,000 cubic feet per second (cfs).

Floods on the Cosumnes River occurred in 1950, 1955, 1958, 1962 and 1964, with the events of 1955, 1958 and 1964, being most severe. In 1958, an estimated 38,000 acres of land were inundated along the Cosumnes River and the lower portions of Dry, Deer, and Laguna Creeks. In 1964, an estimated 30,000 acres of land were inundated.

The floodplain areas of Willow, Humbug, and Hinkle Creeks near the City of Folsom have little existing structural development. The current and past land uses have been agricultural and open space. A thorough search of records has not uncovered any record of past floods. No records have been kept due to the past and current land uses and short duration of flood flows. The flooding events have not been considered significant problems, and the flood damages have not been recorded.

The higher elevation tributary area of the Dry Creek watershed, near the City of Galt, subject to snowfall is too small to generate snowmelt flooding. Snowmelt during a flood-producing rainstorm would not increase runoff significantly. Due to the largely rural nature of the Dry Creek floodplain, and because flood damage has been predominantly agricultural, historical floods have not been documented in much detail. The earliest major flood flow of record, 13,200 cfs, approximately an 11.1- percent annual chance (9-year) flood, occurred on February 2, 1945.

From high-water marks known to long-time residents of the area, an estimated flood flow of 18,700 cfs (approximately a 5.8- percent annual chance [17-year] flood) occurred in February 1936 and a flood flow estimated to be approximately 24,000 cfs (approximately a 2.9-percent annual chance [35-year] flood) occurred in March 1907.

In December 1955, a 17,000 cfs flow (approximately a 7.1-percent annual chance [14-year] flood) on Dry Creek resulted from approximately 7 inches of antecedent rainfall over the tributary drainage. Although there was no Dry Creek overflow into the City of Galt, there was flooding from Hen Creek in the west-central part of the City where water was nearly knee deep along Lois Avenue, and at the Myrtle Avenue-Palin Street and Myrtle Avenue-Oak Avenue intersections. Damage, however, was minor and floodwater receded within 1 day. On April 3, 1958, the largest flood of record, 24,000 cfs (approximately a 2.9-percent annual chance flood), occurred on Dry Creek. Although approximately 9,000 acres of land were flooded along the creek, there was no overflow into the City of Galt. Antecedent rainfall, which was 12.5 inches over a period of several days, had created very wet ground conditions that influenced the magnitude of runoff. Rainfall on January 31 and February 1, 1963, a total of approximately 32 percent of the normal annual precipitation over the Dry Creek drainage, resulted in a flow of 9,800 cfs (approximately a 20-percent annual chance [5-year] flood) on Dry Creek. A small dam at one end of the golf course, which was under construction on the south side of the City of Galt, was breached, and part of the facility was inundated for a short time. During the height of the storm, many streets in the City of Galt were submerged due to lack of adequate storm drainage. In December 1964, approximately 8,200 acres were flooded by Dry Creek; however, overflow near the City of Galt was limited to a portion of the golf course, which was caused when a low levee was overtopped. The flow recorded at the Dry Creek stream gage was 14,500 cfs (approximately a 10-percent annual chance flood). Antecedent rainfall was not significant (USACE, 1955 et cetera; The Galt Herald, 1955 et cetera).

The severity of two areas within the unincorporated areas where the high flow of floodwaters on some channels has a great impact (causing backwater conditions) on the hydraulic regimen of other channels.

High flows on the Sacramento River generate backwater conditions on the lower reaches of the American River and the Cross Canal. The American River peak 1-percent annual chance flows induce backwater conditions in the lower reach of the Natomas East Main Drainage Canal.

Coincidentally, high flows on the Natomas East Main Drainage Canal cause backwater conditions on the lower reaches of Arcade and Dry Creeks. In December 1964 and January 1965, the coincidental occurrence of very high tides and heavy inflow resulted in unusually high stages on all delta waterways. Concurrent strong onshore winds generated high waves that created very perilous conditions for many islands. Several hundred acres were flooded and damages, mainly flood fighting and repair of levees and levee roads, were a little less than \$1 million. In January and February 1969, high tides and adverse wave action in the delta, combined with large river inflow and rain-soaked levees, caused the flooding of several islands and the endangerment of many other islands. Approximately 11,400 acres were inundated and flood damages amounted to about \$9.2 million. The levee separating Andrus Island and the San Joaquin River failed from unknown causes in June 1972, resulting in the flooding of Andrus and Brannan Islands (including the City of Isleton). High winds had occurred prior to the break, but there had been no antecedent rainfall and the tidal cycle was not on the higher side. About 15,000 acres were inundated and flood damages for the event approximated \$30 million.

The American River near the City of Sacramento overflowed in 1928, causing extensive flooding in the River Park and Industrial Park areas on the south bank.

In 1950, the American River inundated extensive areas on the north bank, including the area in the vicinity of Fulton Avenue and Fair Oaks Boulevard.

In December 1955, Arcade Creek overflowed its banks, inundating portions of Del Paso Park as well as areas upstream along Winding Way and portions of the Hagginwood District downstream. Flooding also occurred on Dry and Robla Creeks near the Natomas East Main Drainage Canal.

Floods occurred twice in 1962. The February 1962 floods caused inundation along Arcade Creek in the vicinity of Del Paso Park. The park and the Haggin Golf Course were flooded, and the floodwaters forced the closing of Roseville Road. Dry and Robla Creeks caused flooding in the vicinity of the Natomas East Main Drainage Canal where Rio Linda Boulevard was threatened. Laguna Creek spread out over its floodplain.

A severe, early season rainstorm occurred in October 1962, resulting in widespread flooding in the City of Sacramento. Arcade Creek overflowed from Marysville Road to past Del Paso Park. Six families on Verno Street had to evacuate because the flood threat was particularly severe in this area. Damages were estimated at \$10,000 along Arcade Creek. Excess floodwaters from Dry Creek flowed southerly along the eastern side of the Western Pacific Railroad to Robla Creek and the Magpie Creek Diversion. The resultant high water was within 2 feet of the top of the southern levee of the diversion. Portions of floodwaters from Magpie Creek bypassed the upper portion of the diversion's levee and flowed into Lower Magpie Creek, causing flooding in the area between Dry Creek Road and Raley Boulevard. Dry and Robla Creeks again spread out over their common floodplain near the Natomas East Main Drainage Canal. An estimated \$50,000 in flood-related damages was caused by the flood on Dry Creek. Many of these damages were caused in areas along Dry Creek upstream of the City of Sacramento.

Flooding in January 1967 was less severe than flooding in 1962. Arcade Creek overflowed its banks upstream of the City of Sacramento and flooding in the City was restricted to minor inundation in Del Paso Park. Flooding that occurred in February 1973 on Arcade Creek had a recurrence interval of approximately 10- percent annual chance flood. Dry and Robla Creeks, however, overflowed inside the City.

Morrison Stream Group Flooding

The FIS reviewed flood problems in the Morrison Stream Group. This consists of Cosumnes River, Cosumnes River Above Dillard Road, Cosumnes River Above State Highway 99, Cosumnes River Overflow North of Lambert Road, Elder Creek, Elk Grove Creek, Florin Creek, Gerber Creek, Laguna Creek, Laguna Creek Bypass Channel, Laguna Creek Tributary No. 1, Mather Field Main Drain, Mather Field Main Drain Tributary, Mather Field West Drain, Mather Lake Tributary, Morrison Creek, Strawberry Creek, Unionhouse Creek, And Whitehouse Creek.

Large portions of the Morrison Creek Stream Group area in Sacramento County were flooded in 1952, 1955, 1958, 1962-64, 1966-67 and 1969. During the 1955 flood, overflow from the Cosumnes and Mokelumne Rivers caused inundation of the Beach-Stone Lake area, thus creating high backwater conditions on streams of the Morrison Creek Stream Group. Damage was estimated at \$213,000 in the Morrison Creek Stream Group area as a result of the 1955 floods and at \$204,000 from the 1958 flood. The estimated damage for 1969 was \$159,000.

Floods on the Cosumnes River occurred in 1950, 1955, 1958, 1962 and 1964, with the events of 1955, 1958 and 1964, being most severe. In 1958, an estimated 38,000 acres of land were inundated along the Cosumnes River and the lower portions of Dry, Deer, and Laguna Creeks. In 1964, an estimated 30,000 acres of land were inundated.

In October 1962, the Morrison Creek Basin was again flooded. A local newspaper called the Fruitridge-Florin area “the worst hit,” with water “up to the tops of doors on cars” (Sacramento Bee, 1962). Floodwaters escaped from Morrison Creek near the Sacramento Army Depot. This overflow, along with other overflows from Morrison Creek upstream of Stockton Boulevard, caused widespread inundation of a primarily residential area east of Stockton Boulevard from the City of Sacramento corporate limits north to Fruitridge Road. The Glen Elder section east of Stockton Boulevard and south of Elder Creek Road, was the most severely flooded portion in the Morrison Creek Stream Group area. Laguna, Elder, Florin and Unionhouse Creeks, also overflowed their banks during this flood, adding to the flood problems in the area. A total of \$161,000 in flood-related damages was estimated to have occurred in the entire Morrison Creek Stream Group area during the October 1962 flood.

In 1964, Morrison Creek flooded a large region west of the Western Pacific Railroad tracks and south of Meadowview Road. Laguna Creek flooded an area adjacent to the stream that extended for about six miles from near the City of Elk Grove westerly to the Union Pacific Railroad tracks. The 1964 flooding in the basin inundated about 7,700 acres and caused an estimated \$156,000 in damages.

Moderate agricultural damages estimated at \$104,000 were caused by the 1966-67 flooding, even though more acres were flooded (approximately 8,070 acres), particularly on Laguna Creek which again overflowed into its floodplain, than during the flooding of 1963 and 1964.

The most recent flooding occurred in February 1986. That flood had the largest peak flow recorded on Morrison Creek (slightly higher than the January 1982 peak flow). Both the 1982 and 1986 floods have recurrence intervals of approximately a 4-percent-annual-chance flood. The estimated damage for 1982 was \$500,000. Flooding had also occurred in February 1973 and has a recurrence interval of approximately a 10- percent-annual-chance flood.

There are five main areas of floodwater intermingling in the Morrison Creek Stream Group basin. Between the Central California Traction Company Railroad (CCTCRR) tracks and Florin-Perkins Road, Morrison Creek overflows its south bank, and the floodwaters continue to the south for about one mile and mingle with Florin Creek overflows. Laguna Creek floodwaters overtop the creek's north bank just east of the CCTCRR tracks, flow into the east embankment of the tracks, and then continue northwesterly parallel to the embankment for about one and one-half miles and join Gerber Creek flows. Combined flood flows from Laguna and Gerber Creeks overtop the north bank of Gerber Creek just east of the CCTCRR tracks and flow northwesterly along the east embankment of the tracks for about one mile and then unite with Elder Creek flows. Gerber Creek flood flows overtop the creek's south bank about one-half mile west of the CCTCRR tracks, extend southwesterly for about one mile and mix with Unionhouse Creek flood flows. In the western part of the basin between Franklin Boulevard and the Western Pacific Railroad tracks, floodwaters from various streams commingle.

Sacramento River and the Delta Slough

The FIS reviewed flood problems in the Sacramento River and the Delta Slough. This consists of Georgiana Slough, Sacramento River, Sevenmile Slough, Steamboat Slough, Sacramento Slough, and Three Mile.

The lower reaches/delta of the Sacramento and San Joaquin Rivers are under the influence of the tides. The most severe flood conditions in the delta would result when very high tides and large volume of stream outflow occur coincidentally, and strong onshore winds generate wave action. It should be noted that precipitation over the delta does not materially affect local flood conditions.

A fundamental flood problem in the delta results from the fact that for every square mile of land reclaimed, there is one square mile less of floodplain to contain the volume of the rising tide and outflow from the rivers of the Central Valley. Furthermore, the substructure of much of the Delta is overlain by a 20- to 50-foot thick layer of peat soil, which is ideal for agriculture but very poor as foundation or building material for levees. Peat soil dried out and exposed to air constantly oxidizes and subsides. As islands subside, water pressure in adjoining channels may become too great for levees to withstand and a section may fail. Also, levees are continually being eroded by stream outflow, tidal flow, and wave wash from winds and boat wakes. Increasing levee fill creates compression that may force underlying materials to rupture into the adjoining waterway or toward the land side of the levee. If one island is flooded and its levees are lost, the levees protecting an adjacent island becomes more vulnerable to the forces of waves and wind.

The Sacramento-San Joaquin delta area has a long history of flooding. Since construction of levees started in the early 1860s, every island has been flooded at least once due to levee overtopping or failure. Prior to 1950, most of the failures were due to levee overtopping. However, since the construction of many upstream dams, that flood factor has been reduced and now the major cause of flooding is levee instability. Approximately 12 levee failures have occurred since 1980.

In mid-January 1980, severe rainstorms over central California precipitated high river outflow through the delta, which, coinciding with gale force winds over the delta and high tides, resulted in the levee failure and flooding of two tracts (placing approximately 9,600 acres under water). Continued high inflow to the delta and wind-generated waves increased erosion on all delta levees, necessitating intensive flood fighting and the temporary curtailment of boat traffic. Then in late February 1980, three islands at the lower end of the Yolo Bypass and one additional tract were inundated.

Heavy inflow and strong winds caused by a major storm over California in late November 1982, in combination with high tides, resulted in widespread levee erosion and overtopping in the delta and the flooding of an island and a tract. A succession of intense storms continued to batter the State until March 1983, establishing rainfall records for the delta and tributary regions.

Upstream reservoir releases were larger and sooner than anticipated due to the heavy rainfall and a deep snowpack, worsening an already critical levee situation. Concurrently, extremely high tides prevailed in the delta along with wind-driven waves.

Several levee failures occurred and eight islands/tracts were under water by late March 1983. More than 16,000 acres were flooded and the estimated associated damages amounted to more than \$20 million.

The lower reaches/delta of the Sacramento and San Joaquin Rivers are under the influence of the tides. The most severe flood conditions in the delta would result when very high tides and large volume of stream outflow occur coincidentally, and strong onshore winds generate wave action. It should be noted that precipitation over the delta does not materially affect local flood conditions. More information about past occurrences of flooding in the Delta can be found in the levee failure discussion in Section I.2.

San Joaquin River Stream Group Flooding

The FIS reviewed flood problems in the San Joaquin River Stream Group. This consists of Delta Cross Canal, Mokelumne River, North Fork Mokelumne River, North Fork Mokelumne River Overflow Channel, San Joaquin River, and Snodgrass Slough.

Historically, flooding along the Mokelumne River has been caused by general rainstorms in late fall and winter, and by snowmelt runoff in spring and early summer. The effects of cloudburst storms on an area as large as the Mokelumne River basin is negligible.

Flooding on the detailed study reach of the Mokelumne River has occurred in 1907, 1909, 1911, 1914, 1921, 1925, 1928, 1937, 1950, 1952, 1955-1956, 1963, 1964, 1967, 1969 and 1970. The most disastrous flood was that of November 1950, which caused about \$1.1 million in damages. The December 1955-January 1956 floodwaters caused an estimated \$750,000 in damages. The flood of December 1964 is the largest of record on the Mokelumne River. However, due to the completion of Camanche Dam in April 1964, most damages in the later flood had been prevented. Contemporary accounts of floods on the Mokelumne River are essentially nonexistent. Streamflow recorded for the study reach of the Mokelumne River were begun in 1904.

I.2 Levee Failure Events

The 2024 FIS noted that the Sacramento-San Joaquin Delta area has a long history of flooding. Since construction of levees started in the early 1860s, every island has been flooded at least once due to levee overtopping or failure. Prior to 1950, most of the failures were due to levee overtopping. However, since the construction of many upstream dams, that flood factor has been reduced and now the major cause of flooding is levee instability. Approximately 12 levee failures have occurred since 1980. Andrus, Brannan and Twitchell Islands, have all experienced historical floods. Large areas of the Delta were inundated during floods, and it is probable that the City of Isleton was damaged or seriously threatened.

Past flooding in the City of Isleton area has been due to levee failures caused by the separate or coincidental occurrence of very high tides and high stream outflow through the Delta region, or from unexplained levee failures apparently not related from high tides and/or high stream outflow can reasonably be expected, such failures cannot be reliably predicted. A detailed field inspection of levees protecting Andrus, Brannan and Twitchell Islands, was made to determine levee conditions insofar as it is possible to do so without subsurface exploration. The report on the inspection identifies problem areas susceptible to failure and requires exploratory borings and testing of core materials to definitively determine levee stability (USACE, 1976). Because 2-percent annual chance flooding would overtop levees, stability analysis was deemed unnecessary, and this study is concerned only with levee overtopping and disintegration of levee sections subsequent to overtoppings.

The 1950 and 1955 floods were outstanding in peak outflows through the Delta and several islands were flooded. The City of Isleton, however, was not affected. In December 1965 and January 1966, the coincidental occurrence of very high tides and heavy inflow resulted in unusually high stages on all Delta waterways. Concurrent strong onshore winds generated high waves that created very perilous conditions for many islands. Levees protecting Twitchell Island were seriously threatened by erosion and overtopping, but a massive flood fighting effort prevented overflow, destruction of levees and inundation of the City of Isleton. Several hundred acres were flooded and damages, mainly flood fighting and repair of levees and levee roads, were a little less than \$1 million. In January and February 1969, high tides and adverse wave action in the Delta, combined with large river inflow and rain-soaked levees, caused the flooding of several islands and the endangerment of many other islands. Approximately 11,400 acres were inundated and flood damages amounted to about \$9.2 million. The levee separating Andrus Island and the San Joaquin River failed from unknown causes in June 1972, resulting in the flooding of Andrus and Brannan Islands (including the City of Isleton). High winds had occurred prior to the break, but there had been no antecedent rainfall and the tidal cycle was not on the higher side. About 15,000 acres were inundated and flood damages for the event approximated \$30 million.

The most devastating flooding of the City of Isleton resulted from failure of a levee at the southern end of Andrus Island. The levee failed from unknown causes during the night of June 21, 1972. There had not been any antecedent rainfall and the tidal cycle was not on the higher side, but high winds had been occurring prior to the break. Approximately 200,000 acre-feet of water from the San Joaquin River inundated Andrus and Brannan Islands. Activities to fight floods to protect the City of Isleton proved to be a losing battle, and almost all of the city was flooded. The entire population was evacuated, with some residents not being able to return to their homes for 4 months. Approximately one-half of the housing units

in the city were damaged or destroyed. Damage from the flood event on the islands and in the City of Isleton totaled approximately \$30 million.

Due to the size of the Delta region, and the complexity of its stream and tidal regimen, flood frequency varies from location to location. In general, the 1950, 1955 and 1964 tidal stages in the central Delta, had frequencies of 10, 30 and 5 years, respectively. Stage during the 1955 and 1964 flood periods was strongly influenced by onshore winds. The 1972 flood event cannot be assigned a frequency because the levee failure that caused the flooding cannot be attributed to tidal stage or streamflow conditions.



Appendix J RLAA

INSERT WHEN COMPLETE



Appendix K Watershed Management Plan

INSERT WHEN COUNTY HAS COMPLETED IT