



4 MITIGATION STRATEGY

44 CFR Requirement 201.6(c)(3): The plan shall include a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.

This section presents the mitigation strategy developed by the Hazard Mitigation Planning Committee (HMPC) based on the risk assessment. The mitigation strategy was developed through a collaborative group process and consists of goals, objectives, and mitigation actions. The HMPC used the following definitions, which are based upon those found in FEMA publication 386-3, *Developing the Mitigation Plan* (2002):

- **Goals** are general guidelines that explain what you want to achieve. Goals are defined before considering how to accomplish them so that they are not dependent on the means of achievement. They are usually long-term, broad, policy-type statements.
- **Objectives** define strategies or implementation steps to attain the identified goals and are specific and measurable.
- **Mitigation Actions** are specific actions that help achieve goals and objectives.

4.1 Goals and Objectives

The HMPC developed goals and objectives to provide direction for reducing hazard-related losses in Calaveras County. These were based upon the results of the risk assessment and a review of goals and objectives from other state and local plans, specifically, the California State Multi-Hazard Mitigation Plan, 2007, the Calaveras County General Plan, 1996, the Tuolumne-Calaveras Unit County Pre-Fire Management Plan, 2005, and the Calaveras County Water District Multi-Hazard Mitigation Plan, 2007. This review was to ensure that this plan's mitigation strategy was integrated with existing plans and policies.

Through a brainstorming process at their third meeting, the HMPC identified a variety of possible goals and then came to a consensus on four main ones. Following the development of goals, the HMPC identified specific objectives to achieve each goal. Goals and objectives are listed below, but are not prioritized:

Goal 1: Reduce risk to the people, property, economy, and environment in Calaveras County from the impacts of natural hazards

- Maintain flood protection program to 100-year level of protection
- Identify significant environmental features to protect
- Maintain channels and levees
- Provide additional services to special needs populations

Goal 2: Reduce the vulnerability of future development to natural hazards

- Enforce appropriate building standards in accordance with existing codes, including floodplain ordinances

Goal 3: Improve education and awareness of hazards and risk

- Educate public, property owners, and officials about flood hazards
- Educate property owners about defensible space
- Increase risk awareness of public, governments, and businesses

Goal 4: Enhance partnerships for communication and coordination in the region

- Improve partnerships and communication with school districts and crisis response/emergency responders
- Improve coordination between Calaveras County and Angels Camp
- Provide cross-training between jurisdictions to improve capabilities

Goal 5: Implement identified mitigation activities

- Assign Calaveras County Multi-Agency Committee (MAC) Group responsibility as an ongoing advisory group to address mitigation issues
- Integrate mitigation activities into existing and new community plans and policies

4.2 Identification and Analysis of Mitigation Actions

44 CFR Requirement §201.6(c)(3)(ii): The mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

To identify and analyze potential mitigation actions to achieve the mitigation goals, the HMPC discussed the key issues that emerged in the Risk Assessment Summary in Section 3.4. Each hazard identified in Section 3.1 was evaluated. Only those hazards with planning significance rating of moderate or high were determined to be a priority hazard and were considered further in the development of hazard-specific mitigation measures. The following are Calaveras County's priority hazards:

- Dam Failure
- Drought
- Extreme Heat
- Flood
- Winter Storm
- Wildfire

The HMPC eliminated other hazards from further consideration in the development of mitigation actions because the risk of a hazard event in the County is unlikely, the vulnerability of the

County to the hazard is low, or capabilities are already in place to mitigate its negative impacts. It is important to note that many of the final mitigation actions are multi-hazard actions designed to reduce potential losses from all types of hazard events.

To identify and analyze potential mitigation actions to achieve the mitigation goals, AMEC provided the HMPC with a packet of materials at its third meeting with information on types of mitigation actions, key issues from Chapter 3 Risk Assessment, and a worksheet of the plan's goals and objectives.

The group discussed different types of mitigation actions. They were provided with the following list of categories of mitigation actions, which originated from the National Flood Insurance Program's Community Rating System, as well as definitions and examples for each category:

- **Prevention:** Administrative or regulatory actions or processes that influence the way land and buildings are developed and built.
- **Property protection:** Actions that involve the modification of existing buildings or structures to protect them from a hazard or remove them from the hazard area.
- **Structural:** Actions that involve the construction of structures to reduce the impact of a hazard.
- **Natural resource protection:** Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems.
- **Emergency services:** Actions that protect people and property during and immediately after a disaster or hazard event.
- **Public education and awareness:** Actions to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them.

Next, the HMPC discussed the key issues for each priority hazard that emerged from the Risk Assessment. To facilitate the brainstorming process, the HMPC used a worksheet with the plan's previously identified goals and objectives. For each of the five goals, each HMPC member identified at least three mitigation actions that would work toward achieving the mitigation goals. Each action was written on one index card, posted on the wall of the meeting room, and organized by the goal it represents.

Next, the HMPC re-sorted these index cards by the six priority hazards and a multi-hazard category. They discussed a list of potential mitigation alternatives for each of these hazards, which had been prepared by AMEC. This list is included in Appendix C. Based upon the key issues identified in the risk assessment, including the existing capabilities of jurisdictions, and the overall political, technical, and financial feasibility of the potential actions, the HMPC came to consensus on mitigation actions for each hazard. New actions were written on index cards and added to those already on the wall organized by hazard. Certain hazards were best addressed through multi-hazard actions.

4.3 Implementation of Mitigation Actions

44 CFR Requirement §201.6(c)(3)(ii): The mitigation strategy shall include an action strategy describing how the actions identified in paragraph (c)(2)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefits review of the proposed projects and their associated costs.

To prioritize the mitigation actions, the HMPC discussed the STAPLEE prioritization criteria recommended by FEMA. STAPLEE is a tool used to assess the costs and benefits and overall feasibility of mitigation actions. STAPLEE stands for the following:

- **Social:** Will the action be acceptable to the community? Could it have an unfair effect on a particular segment of the population?
- **Technical:** Is the action technically feasible? Are there secondary impacts? Does it offer a long-term solution?
- **Administrative:** Are there adequate staffing, funding, and maintenance capabilities to implement the project?
- **Political:** Will there be adequate political and public support for the project?
- **Legal:** Does the jurisdiction have the legal authority to implement the action?
- **Economic:** Is the action cost-beneficial? Is there funding available? Will the action contribute to the local economy?
- **Environmental:** Will there be negative environmental consequences from the action? Does it comply with environmental regulations? Is it consistent with community environmental goals?

At its third meeting, the HMPC used STAPLEE to determine which of the identified actions were most likely to be implemented and effective. Each member used STAPLEE to identify his or her top four mitigation actions and then voted for these actions by sticking a colored dot on the index card on which the action was written. The number of dots next to each action was totaled. See Appendix C for the votes given to each identified mitigation action.

This process of identification and analysis of mitigation alternatives allowed the HMPC to come to consensus and to prioritize recommended mitigation actions. Emphasis was placed on the importance of a benefit-cost analysis in determining project priority; however, this was not a quantitative analysis. The Disaster Mitigation Act regulations state that benefit-cost review is the primary method by which mitigation projects should be prioritized. Criteria used to assist in evaluating the benefit-cost of a mitigation action included:

- Does the action address hazards or areas with the highest risk?
- Does the action protect lives?
- Does the action protect infrastructure, community assets or critical facilities?
- Does the action meet multiple objectives (Multiple Objective Management)?

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- What will the action cost?
 - What is the timing of available funding?

Recognizing the federal regulatory requirement to prioritize by benefit-cost, and the need for any publicly funded project to be cost-effective, the HMPC decided to pursue implementation according to when and where damage occurs, available funding, political will, jurisdictional priority, and priorities identified in the California State Multi-Hazard Mitigation Plan. Cost-effectiveness will be considered in additional detail through a formal benefit cost analysis when seeking FEMA mitigation grant funding for eligible projects identified in this plan.

The mitigation actions developed by the HMPC are summarized in Table 4.1. The HMPC came to consensus on which departments and persons are responsible for completing an implementation worksheet for the County for each identified mitigation action. The worksheets document background information, ideas for implementation, lead agency, partners, potential funding, cost estimates, benefits, and timeline for each identified action.

Table 4.1 summarizes all of the prioritized mitigation actions and indicates which jurisdictions plan to implement them; it also provides information on the hazards and plan goals addressed. The mitigation action implementation worksheets for multi-jurisdictional actions and County actions follow the matrix. The implementation worksheets for Angels Camp are included in Annex A to the plan.

Table 4.1. Mitigation Action Matrix

Action	Jurisdiction	Priority	Links to Goals	Hazards Addressed
Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	Calaveras County OES	High		All
Develop and Conduct a Multi-Hazard Seasonal Public Awareness Program	Calaveras County OES	High		All
Identify critical facilities/infrastructure needing backup power sources	Public Works Department	Low	This Action Falls under Goal 1: Reduce risk to the people, property, economy, and environment in Calaveras County from the impacts of natural hazards	All
Improve channel maintenance and upkeep to prevent debris build-up at road bridges	Public Works Department	High	This Action Falls under: Goal 1: Reduce risk to the people, property, economy, and environment in Calaveras County from the impacts of natural hazards	Flood
Implement fuel reduction along County right of ways	Public Works Department	Medium	This Action Falls under : Goal 1: Reduce risk to the people, property, economy, and environment in Calaveras County from the impacts of natural hazards	Wildfire
Identify storm water flooding projects	Public Works Department	Low	This Action Falls under: Goal 1: Reduce risk to the people, property, economy, and environment in Calaveras County from the impacts of natural hazards	Flood

1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan

Issue/Background: Local jurisdiction reimbursement for mitigation projects and cost recovery after a disaster is guided, in part, by AB 2140. Specifically, this bill requires that each jurisdiction adopt a local hazard mitigation plan (LHMP) in accordance with the federal Disaster Mitigation Act of 2000 as part of the safety element of its general plan. Adoption into the safety element of the general plan may be by reference or incorporation.

Other Alternatives: No action

Responsible Office: Calaveras County OES, Planning Departments for each incorporated jurisdiction

Priority (High, Medium, Low): High

Cost Estimate: Staff time

Potential Funding: County and jurisdictional budgets

Benefits (avoided Losses): Adoption and coordination of planning documents will help jurisdictions maximize potential for state reimbursement

Schedule: As soon as possible

2. Develop and Conduct a Multi-Hazard Seasonal Public Awareness Program

Issue/Background: Calaveras County is subject to several natural hazards. Each poses a different degree of risk and associated vulnerability. Some hazards have a combination of attributes, including a high likelihood of occurrence, a specific location that would likely be impacted, and proven approaches that could reduce the impact. For other hazards, where either the likelihood of occurrence is very low, the area of likely impact is not specifically known, or there is very little that can be done to reduce the impacts, the HMPC has determined that the best approach is public awareness. People should have information describing historical events and losses, the likelihood of future occurrences, the range of possible impacts, appropriate actions to save lives and minimize property damage, and where additional information can be found. Any information provided through this effort should be accurate, specific, timely, and consistent with current and accepted local emergency management procedures as promoted by the California Emergency Management Agency (CAL EMA) and the American Red Cross. This public outreach effort should be conducted annually and should include:

- Using a variety of information outlets, including local news media;
- Creating and printing (where applicable) brochures, leaflets, water bill inserts, websites, and public service announcements;
- Displaying current brochures and flyers in County and City office buildings, libraries, and other public places; and

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- Developing public-private partnerships and incentives to support public education activities.

Other Alternatives: Continue public information activities currently in place

Responsible Office: Calaveras County Office of Emergency Services, Planning Department, Calaveras County Public Information Office, Calaveras County Chamber of Commerce, American Red Cross, and Calaveras County Office of Economic Development.

Priority (High, Medium, Low): High

Cost Estimate: \$5,000-20,000 annually, depending on printing and mailing costs, level of volunteer participation, and scope and frequency of events

Potential Funding: FEMA's Hazard Mitigation Grant Program, Calaveras County funds, other available grants

Benefits (Avoided Losses): Life safety, reduction in property losses, relatively low cost

Schedule: Part of seasonal multi-hazard public awareness campaign

3. Improve channel maintenance and upkeep to prevent debris build-up at road bridges

Priority: High

Background/Issue: Calaveras County Public Works department is not responsible for typical channel clearing. Most channels reside on non County property. The county only has the authority to clear 50' on either side of a bridge crossing.

Ideas for Implementation: Calaveras County Public Works department has in place a five year extendable to ten year Routine Maintenance Agreement with Department of Fish and Game which permit streambed vegetation removal within 50' of man made structures used as crossing. County would continue to use this process at bridge crossings for the purpose of vegetation and debris removal.

Responsible Agency: Bridge crossings on County Roads = Calaveras County Public Works

Partners: USFWS, USACE, CWRB, CFG

Potential Funding: Prop 1-B, Prop 42

Cost Estimate: Thirty-six bridges = \$87,000 if only cleaned once per year

Benefits: (Losses Avoided)

- Reliable water delivery down stream
- Reduced risk of property damage
- Protect public safety

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- Preserve community ingress and egress

Timeline: Each year prior to winter and spring rains

4. Implement fuel reduction along County right of ways

Priority: Medium

Background/Issue: Due to the density of the vegetation and the extreme hazard of fire ladder material which extends in many cases from the County right a ways into highly inhabited areas.

The fuel reduction project includes thinning and chipping areas along right a way of County property in and around the lower sub division, as well as thinning and clearing key transportation corridors in and around

Project work would involve thinning and chipping young trees and underbrush.

Fuel conditions (surface, ladder, and canopy) contribute to initiating or sustaining a crown fires.

The above actions require the involvement of all property owners as well as the County, State and Federal land managers.

Ideas for Implementation: Mitigation of fire risk involves further action that need to be addressed in the future. The actions identified in this list should be addressed in the next five years.

- Undertake fuel modification efforts along County right a ways and access roads to maximize effectiveness establishing and maintaining a cleared area the width of the road right-of-way along all common roads will provide safe ingress or egress for residents, visitors, and emergency personnel, as well as providing a fuel break.
- Removal of all encroaching shrubs and over hanging tree branches and maintaining a zero tolerance for vegetation growth during the growing season.
- If shrubs are to be retained as part of the landscape they should be isolated as individual plants or as small clumps.
- Remove all dead wood from both the mountain shrubs and trees that may be present to reduce their flammability. Dead woody material will be removed from County right a ways and properly disposed.
- All conifer trees should be pruned up to 1/3 rd of their height (i.e., remove ladder fuels 5-8 feet up from the ground). This should decrease the potential for surface fire to move into the tree crowns.
- Contract with CDF Crews for regular maintenance of fire break along County right of ways.
- Develop public programs that will reach the seasonal residents of the county subdivisions and parcel developers in order for a lot-by-lot fuel reduction program to be most effective.
- Develop a schedule for vegetation clearing along County rights of ways to reduce fuel along roads each spring/summer.

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- Develop a plan for construction of fuel break along county/federal and state boundaries that will provide for lower fuel loadings in the grass and shrub stands.
 - Develop a fuel break maintenance schedule
 - Where desirable vegetation exists, it should be maintained through proper management practices

Responsible Agency: Calaveras County Public Works Department

Partners:

Potential Funding: Prop 42

Cost Estimate: Proposed work to be completed by CDF crews with minimum forced labor at an estimated cost of \$20,000

Benefits (Losses Avoided): Preservation of life and property

Timeline: Could be implemented within the next five years

5. Identify storm water flooding projects

Priority: Low

Background/Issue: Flooding due to topography and soil saturation causes major threat to life and property. Flooding in 2006 resulted in community isolation for short periods of time. Most flooding is due to heavy rain fall resulting in soil saturation which leads to flash flooding

Ideas for Implementation: The Sacramento District, U.S. Army Corps of Engineers, Calaveras County and Calaveras County Water District have partnered, under CAP Section 205, to conduct a flood damage reduction study. This study and potential project is part of the County's ongoing commitment to long term planning to reduce flooding damages in the study area.

In addition, the County has in place its storm water management plan which endeavours to contain work site runoff from entering local waterways.

Responsible Agency: Calaveras County Public Works

Partners: USACE, CCWD, RWCB

Potential Funding: Funding is through a USACE Grant with matching and in-kind funds

Cost Estimate:

Benefits (Losses Avoided): Reduce flooding potential in northern Valley Springs area resulting in protection of life and property

Timeline: Project completion over next five years

6. Identify critical facilities/infrastructure needing backup power sources

Priority: Low

Background/Issue:

Ideas for Implementation:

- Critical Facilities:
 - Facilities in which > 300 people congregate
 - Daycares, elementary schools and secondary schools with > 250 people
 - College and adult education facilities with > 50 people
 - Hospitals and Healthcare facilities with > 50 resident patients
 - Jails and detention facilities
 - Power, Wastewater and potable water treatment facilities
 - Fire, rescue and police facilities
 - Designated emergency shelters
 - Power generation and public utility facilities
 - Aviation facilities
 - Critical national defense facilities
 - Nursing and personal care facilities
 - Senior citizen assisted housing
 - Sites that produce, use or store hazardous substances or hazardous waste (not including sites that temporarily store household products intended of sale on the site)
- Critical infrastructure:
 - Energy and utilities (e.g. electrical power, natural gas and transmission systems)
 - Communications and information technology (e.g. telecommunications, broadcasting systems, software, hardware and networks including the Internet)
 - Finance (e.g. banking, securities and investment)
 - Health care (e.g. hospitals, health care and blood supply facilities, laboratories and pharmaceuticals)
 - Food (e.g. safety, distribution, agriculture and food industry)
 - Water (e.g. drinking water and wastewater facilities)
 - Safety (e.g. hazardous materials, search and rescue, emergency services and dams)
 - Government (e.g. services, information networks)
 - Manufacturing (e.g. industrial base, chemical industry)

Responsible Agency: Calaveras County

Partners: PG&E, Caltel, CCWD, Wastewater treatment

Potential Funding:

Cost Estimate:

Benefits (Losses Avoided):

- Protection of life and property
- Reliable communications

Timeline: Complete over next two years