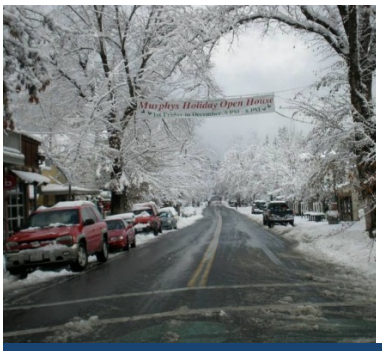
Calaveras County
Local Hazard Mitigation Plan Update
October 2015 (Revised February 2016)



Foster Morrison

Executive Summary

The purpose of hazard mitigation is to reduce or eliminate long-term risk to people and property from hazards. Calaveras County developed this Local Hazard Mitigation Plan (LHMP) update to make the County and its residents less vulnerable to future hazard events. This plan was prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 so that Calaveras County would be eligible for the Federal Emergency Management Agency's (FEMA) Pre-Disaster Mitigation and Hazard Mitigation Grant programs.

The County followed a planning process prescribed by FEMA, which began with the formation of a hazard mitigation planning committee (HMPC) comprised of key County representatives, and other regional stakeholders. The HMPC conducted a risk assessment that identified and profiled hazards that pose a risk to the County, assessed the County's vulnerability to these hazards, and examined the capabilities in place to mitigate them. The County is vulnerable to several hazards that are identified, profiled, and analyzed in this plan. Floods, levee failures, wildfires, and severe weather are among the hazards that can have a significant impact on the County.

Based on the risk assessment, the HMPC identified goals and objectives for reducing the County's vulnerability to hazards. These goals and mitigation strategy of this Plan Update are desires based on the LHMP Update process. Nothing in this Plan Update should be construed as a mandate on the County or the City of Angels Camp. The goals and objectives of this multi-hazard mitigation plan are:

Goal 1: Minimize risk and vulnerability of the community to the impacts of natural hazards and protect lives and reduce damages and losses to property, economy, and environment in Calaveras County.

- Minimize economic and resource impacts and promote long-term viability and sustainability of County resources
- Minimize impact to both existing and future development
- Provide protection for public health
- Prevent and reduce wildfire risk and related losses

Goal 2: Provide protection for critical facilities, infrastructure, utilities and services from hazard impacts.

Goal 3: Improve public awareness, education, and preparedness for hazards that threaten our communities.

- Enhance public outreach, education and preparedness program to include all hazards of concern
- Increase public knowledge about the risk and vulnerability to identified hazards and their recommended responses to disaster events, including evacuation and sheltering options
- Provide planning and coordination for "At-Risk" populations
- Provide planning and coordination for companion animals, livestock and other animal populations
- Increase community awareness and participation in hazard mitigation projects and activities

Goal 4: Increase communities' capabilities to be prepared for, respond to, and recover from a disaster event.

- Improve interagency (local, state, federal) emergency coordination, planning, training, and communication to ensure effective community preparedness, response and recovery
- Enhance collaboration and coordination of disaster-related plans, exercises, and training with local, state, and federal agencies, neighboring communities, private partners, and volunteers
- Enhance the use of shared resources/Develop a strong mutual aid support system
- Create and maintain a fully functional, interoperable radio and communication system with all regional public safety partners

Goal 5: Maintain FEMA Eligibility/Position the communities for grant funding.

Actions to support these goals are shown on Table ES-1.

Table ES-1 Calaveras County Planning Area Mitigation Actions

Action	Project Lead/Participating Agencies	New Action/ 2010 Action	Addresses Current Development	Addresses Future Development	Continued Compliance w/NFIP
Calaveras County					
Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	Calaveras County Planning Department	2010 Action	X	X	
Develop and Conduct a Multi-Hazard Seasonal Public Awareness Program	Calaveras County Sherriff's Office	2010 Action	X	X	X
Identify Critical Facilities/Infrastructure Needing Backup Power Sources	Calaveras County Public Works Department	2010 Action	X	X	X
Improve Channel Maintenance and Upkeep to Prevent Debris Build-up at Road Bridges	Calaveras County Public Works Department	2010 Action	X	X	X
Implement Fuel Reduction along County Right of Ways	Calaveras County Public Works Department	2010 Action	X	X	
Identify Storm Water Flooding Projects	Calaveras County Public Works Department	2010 Action	X	X	X
Retrofit At-Risk Structures with Ignition-Resistant Materials	Calaveras Fire Safe Council, CAL FIRE, local fire districts	New Action	X	X	
Create Defensible Space Around Structures and Infrastructure	Calaveras Fire Safe Council, CAL FIRE, local fire districts	New Action	X	X	
Conduct Maintenance to Reduce Risk	Calaveras Fire Safe Council, CAL FIRE, local fire districts	New Action	X	X	
Implement a Fuels Management Program	Calaveras Fire Safe Council, CAL FIRE, local fire districts	New Action	X	X	
Participate in Firewise Program	Calaveras Fire Safe Council, CAL FIRE, local fire districts	New Action	X	X	
Increase Wildfire Risk Awareness	Calaveras Fire Safe Council, CAL FIRE, local fire districts	New Action	X	X	
Educate Property Owners about Wildfire Mitigation Techniques	Calaveras Fire Safe Council, CAL FIRE, local fire districts	New Action	X	X	
Schaads Reservoir Siltation Removal	Calaveras Public Utility District	New Action	X	X	X

Action	Project Lead/Participating Agencies	New Action/ 2010 Action	Addresses Current Development	Addresses Future Development	Continued Compliance w/NFIP
Schaads Reservoir Conveyance Systems	Calaveras Public Utility District	New Action	X	X	X
Distribution System Up-Grades for Fire Flow	Calaveras Public Utility District	New Action	X	X	
GIS Mapping of Distribution System & FH Locations	Calaveras Public Utility District	New Action	X	X	
Rail Road Flat to Mountain Ranch System Extension	Calaveras Public Utility District	New Action	X	X	
Leonard Road System Extension	Calaveras Public Utility District	New Action	X	X	
East San Andreas Extension	Calaveras Public Utility District	New Action	X	X	
Temporary Animal Shelter	Calaveras County Animal Services	New Action	X		
Preparedness Education of the Public	Calaveras County Animal Services	New Action	X		
Communication System Enhancements	Calaveras County Sheriff's Office in conjunction with the City of Angels Police Department and Cal Fire	New Action	X	X	
FMAG Hazard Mitigation – Calaveras County Burn Area	Calaveras County	New Action	X	X	X
Mokelumne Watershed Protection Project	Calaveras County	New Action	X	X	X
Pardee Reservoir Protection	Calaveras County	New Action	X	X	
New Hogan Reservoir Protection	Calaveras County	New Action	X	X	
Whiskey Slide Road at Wet Gulch Culvert Replacement Project	Calaveras County	New Action	X	X	X
Cosgrove Creek Flood Mitigation	Calaveras County	New Action	X	X	X
City of Angels					
Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	City of Angels Camp	2010 Action	X	X	
Develop and Conduct a Multi-Hazard Seasonal Public Awareness Program	City of Angels Camp	New Action	X	X	X
Retrofit At-Risk Structures with Ignition-Resistant Materials	City of Angels Camp	New Action	X	X	

Action	Project Lead/Participating Agencies	New Action/ 2010 Action	Addresses Current Development	Addresses Future Development	Continued Compliance w/NFIP
Create Defensible Space Around Structures and Infrastructure	City of Angels Camp	New Action	X	X	
Conduct Maintenance to Reduce Risk	City of Angels Camp	New Action	X	X	
Implement a Fuels Management Program	City of Angels Camp	New Action	X	X	
Participate in Firewise Program	City of Angels Camp	New Action	X	X	
Increase Wildfire Risk Awareness	City of Angels Camp	New Action	X	X	
Educate Property Owners about Wildfire Mitigation Techniques	City of Angels Camp	New Action	X	X	
Reclaimed Water Line	City of Angels Camp	New Action	X	X	
Water Storage Tank	City of Angels Camp	New Action	X	X	
Sewer Line to Fairgrounds	City of Angels Camp	New Action	X	X	
Storm Drain Master Plan	City of Angels Camp	New Action	X	X	X
Emergency Power to Command Center and Cooling/Warming Centers	City of Angels Camp	New Action	X	X	
Water Line to Whittle Road	City of Angels Camp	New Action	X	X	

This Page Intentionally Left Blank

Table of Contents

Chapters

1 INTRODUCTION 1-1

1.1 Purpose 1-1
1.2 Background and Scope 1-1
1.3 Planning Area Profile 1-2
1.3.1 History 1-5
1.3.2 Geography and Climate 1-5
1.3.3 Population 1-5
1.3.4 Economy 1-6
1.4 Plan Organization 1-7

2 WHAT'S NEW 2-1

2.1 What's New in the Plan Update 2-1
2.2 2010 LHMP Mitigation Strategy Status and Successes 2-3
2.2.1 Past Mitigation Action Update 2-3

3 PLANNING PROCESS 3-1

3.1 Local Government Participation 3-1
3.2 The 10-Step Planning Process 3-2
3.2.1 Phase 1: Organize Resources 3-3
3.2.2 Phase 2: Assess Risks 3-12
3.2.3 Phase 3: Develop the Mitigation Plan 3-12
3.2.4 Phase 4: Implement the Plan and Monitor Progress 3-13

4 RISK ASSESSMENT 4.1

4.1 Hazard Identification: Natural Hazards 4-2
4.1.1 Methodology and Results 4-2
4.1.2 Disaster Declaration History 4-5
4.2 Hazard Profiles 4-7
4.2.1. Severe Weather: General 4-8
4.2.2. Severe Weather: Extreme Heat 4-10
4.2.3. Severe Weather: Heavy Rain and Storms 4-15
4.2.4. Severe Weather: Wind (including tornadoes) 4-22
4.2.5. Severe Weather: Winter Storms and Extreme Cold 4-28
4.2.6. Agricultural Hazards 4-36
4.2.7. Avalanche 4-38
4.2.8. Dam Failure 4-39
4.2.9. Drought and Water Shortage 4-47
4.2.10. Earthquake 4-55

4.2.11. Flood: 100-/500-year and Flood: Localized Stormwater Flooding....4-65
4.2.12. Landslides and Debris Flows....4-80
4.2.13. Levee Failure....4-82
4.2.14. Volcanoes....4-83
4.2.15. Wildfires....4-89
4.2.16. Natural Hazard Summary and Prioritization....4-97
4.3 Vulnerability Assessment....4-98
4.3.1. Calaveras County's Vulnerability and Assets at Risk....4-98
4.3.2. Calaveras County's Vulnerability to Specific Hazards....4-125
4.3.3. Agricultural Hazards Vulnerability Assessment....4-126
4.3.4. Drought and Water Storage Vulnerability Assessment....4-129
4.3.5. Earthquake Vulnerability Assessment....4-133
4.3.6. Flood Vulnerability Assessment....4-135
4.3.7. Flood: Localized Flooding Vulnerability Assessment....4-155
4.3.8. Severe Weather: Heavy Rains and Storms Vulnerability Assessment....4-156
4.3.9. Severe Weather: Winter Weather and Freeze Vulnerability Assessment....4-156
4.3.10. Wildfire Vulnerability Assessment....4-158
4.4 Capability Assessment....4-173
4.4.1. Calaveras County's Regulatory Mitigation Capabilities....4-173
4.4.2. Calaveras County's Administrative/Technical Mitigation Capabilities....4-194
4.4.3. Calaveras County's Fiscal Mitigation Capabilities....4-196
4.4.4. Mitigation Outreach and Partnerships....4-196
4.4.5. Other Mitigation Efforts....4-197

5 MITIGATION STRATEGY....5-1

5.1 Mitigation Strategy: Overview....5-1
5.1.1 Continued Compliance with NFIP....5-2
5.2 Goals and Objectives....5-2
5.3 Identification and Analysis of Mitigation Actions....5-4
5.31 Prioritization Process....5-5
5.4 Mitigation Action Plan....5-7

6 PLAN ADOPTION....6-1

7 PLAN IMPLEMENTATION AND MAINTENANCE....7-1

7.1 Implementation....7-1
7.1.1 Role of Hazard Mitigation Planning Committee in Implementation and Maintenance....7-2
7.2 Maintenance....7-3
7.2.1 Maintenance Schedule....7-3
7.2.2 Maintenance Evaluation Process....7-3
7.2.3 Incorporation into Existing Planning Mechanisms....7-4
7.2.4 Continued Public Involvement....7-5

Annexes

Annex A: City of Angels Camp

Appendices

Appendix A: Planning Process

Appendix B: References

Appendix C: Mitigation Strategy

Appendix D: Adoption Resolutions

Appendix E: Wildfire History

Appendix F: Critical Facilities

Chapter 1 Introduction

1.1 Purpose

Calaveras County and the City of Angels Camp prepared this Local Hazard Mitigation Plan (LHMP) Update to the 2010 Calaveras County LHMP to guide hazard mitigation planning to better protect the people and property of the County from the effects of hazard events. This plan demonstrates the communities' commitment to reducing risks from hazards and serves as a tool to help decision makers direct mitigation activities and resources. This plan was also developed to make Calaveras County and Angels Camp eligible for certain federal disaster assistance, specifically, the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Grant Program, Pre-Disaster Mitigation program, and Flood Mitigation Assistance program. Although this plan was originally submitted and approved by Cal OES and FEMA (for Calaveras County) in September 2015 in the immediate aftermath of the Butte Fire, as part of the initial approval process, it was agreed that this LHMP Update would include a final revision and submittal within 90-days of County Board of Supervisor's adoption in November 2015. This February 2016 Revised LHMP Update satisfies the County's obligation to Cal OES and FEMA for resubmittal.

1.2 Background and Scope

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

Hazard mitigation is defined by FEMA as "any sustained action taken to reduce or eliminate long-term risk to human life and property from a hazard event." The results of a three-year, congressionally mandated independent study to assess future savings from mitigation activities provides evidence that mitigation activities are highly cost-effective. On average, each dollar spent on mitigation saves society an average of $4 in avoided future losses in addition to saving lives and preventing injuries (National Institute of Building Science Multi-Hazard Mitigation Council 2005).

Hazard mitigation planning is the process through which hazards that threaten communities are identified, likely impacts of those hazards are determined, mitigation goals are set, and appropriate strategies to lessen impacts are determined, prioritized, and implemented. This plan documents Calaveras County's hazard mitigation planning process and identifies relevant hazards and vulnerabilities and strategies the County and Angels Camp will use to decrease vulnerability and increase resiliency and sustainability in Calaveras County.

The Calaveras County Multi-Hazard Mitigation Plan Update is a multi-jurisdictional plan that geographically encompasses Calaveras County's jurisdictional boundaries (hereinafter referred to as the

planning area). The participating jurisdictions seeking FEMA approval for this Plan Update are Calaveras County and the City of Angels Camp.

This Plan Update was prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 (Public Law 106-390) and the implementing regulations set forth by the Interim Final Rule published in the Federal Register on February 26, 2002, (44 CFR §201.6) and finalized on October 31, 2007. The 2007 amendments also incorporate mitigation planning requirements of the Flood Mitigation Assistance (FMA) program authorized by the National Flood Insurance Act of 1968. While the Disaster Mitigation Act emphasized the need for mitigation plans and more coordinated mitigation planning and implementation efforts, the regulations established the requirements that local hazard mitigation plans must meet in order for a local jurisdiction to be eligible for certain federal disaster assistance and hazard mitigation funding under the Robert T. Stafford Disaster Relief and Emergency Act (Public Law 93-288). This planning effort also follows FEMA's 2011 Local Plan Review Guide and the 2013 Local Mitigation Planning Handbook.

Information in this plan will be used to help guide and coordinate mitigation activities and decisions for local land use policy in the future. Proactive mitigation planning will help reduce the cost of disaster response and recovery to communities and their residents by protecting critical community facilities, reducing liability exposure, and minimizing overall community impacts and disruptions. The Calaveras County planning area has been affected by hazards in the past and is thus committed to reducing future impacts from hazard events and becoming eligible for mitigation-related federal funding.

1.3 Planning Area Profile

The planning area boundaries for this plan are coterminous with the boundaries of the County itself and encompasses the approximately 657,000 acres of land ranging from the San Joaquin Valley to the Sierra Nevada Mountains. This includes the incorporated City of Angels Camp and all unincorporated areas. Figure 1-1 shows a map of the Calaveras County planning area. A land ownership map for the County is shown in Figure 1-2.

Figure 1-1 Calaveras County Planning Area

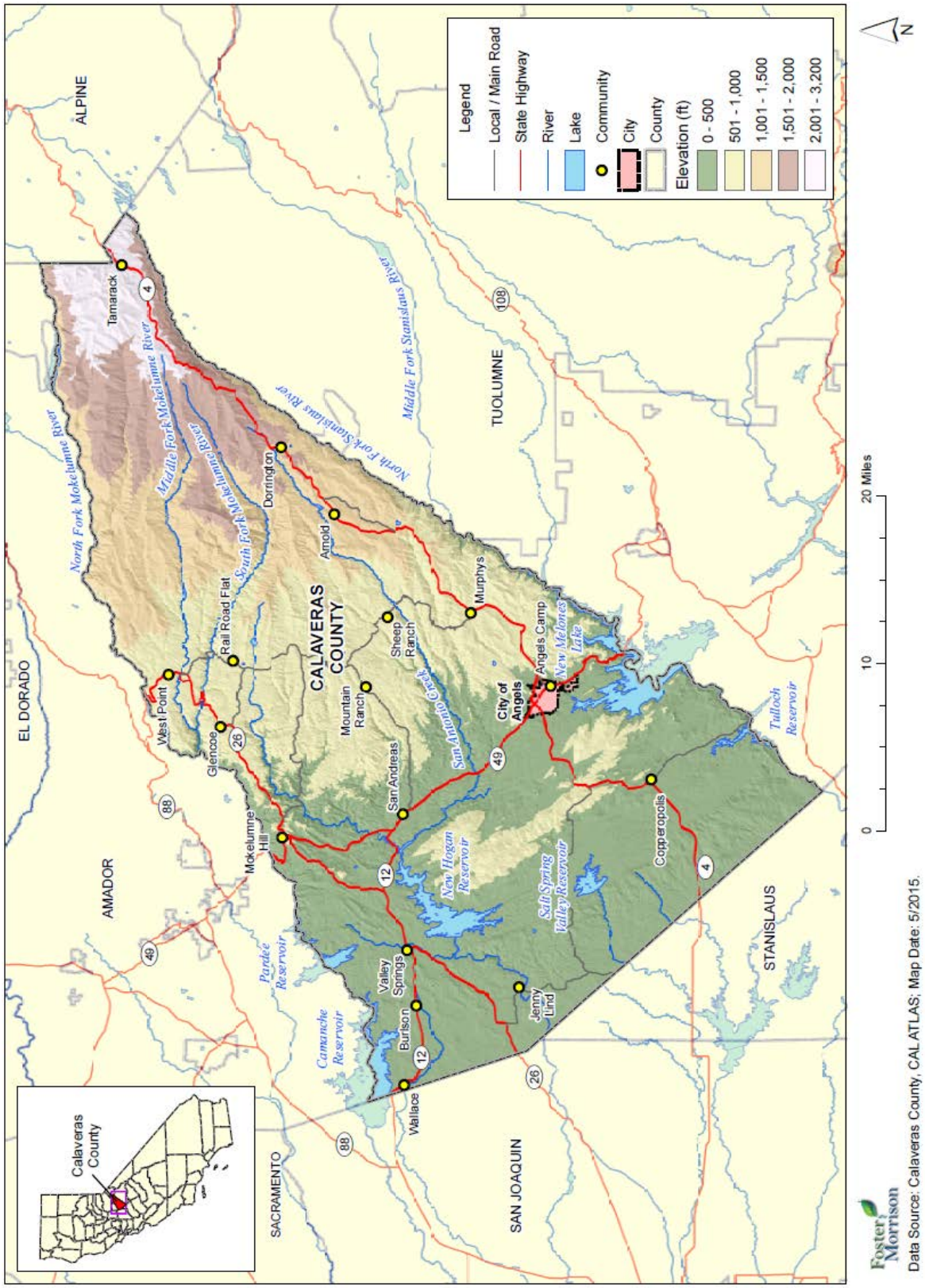
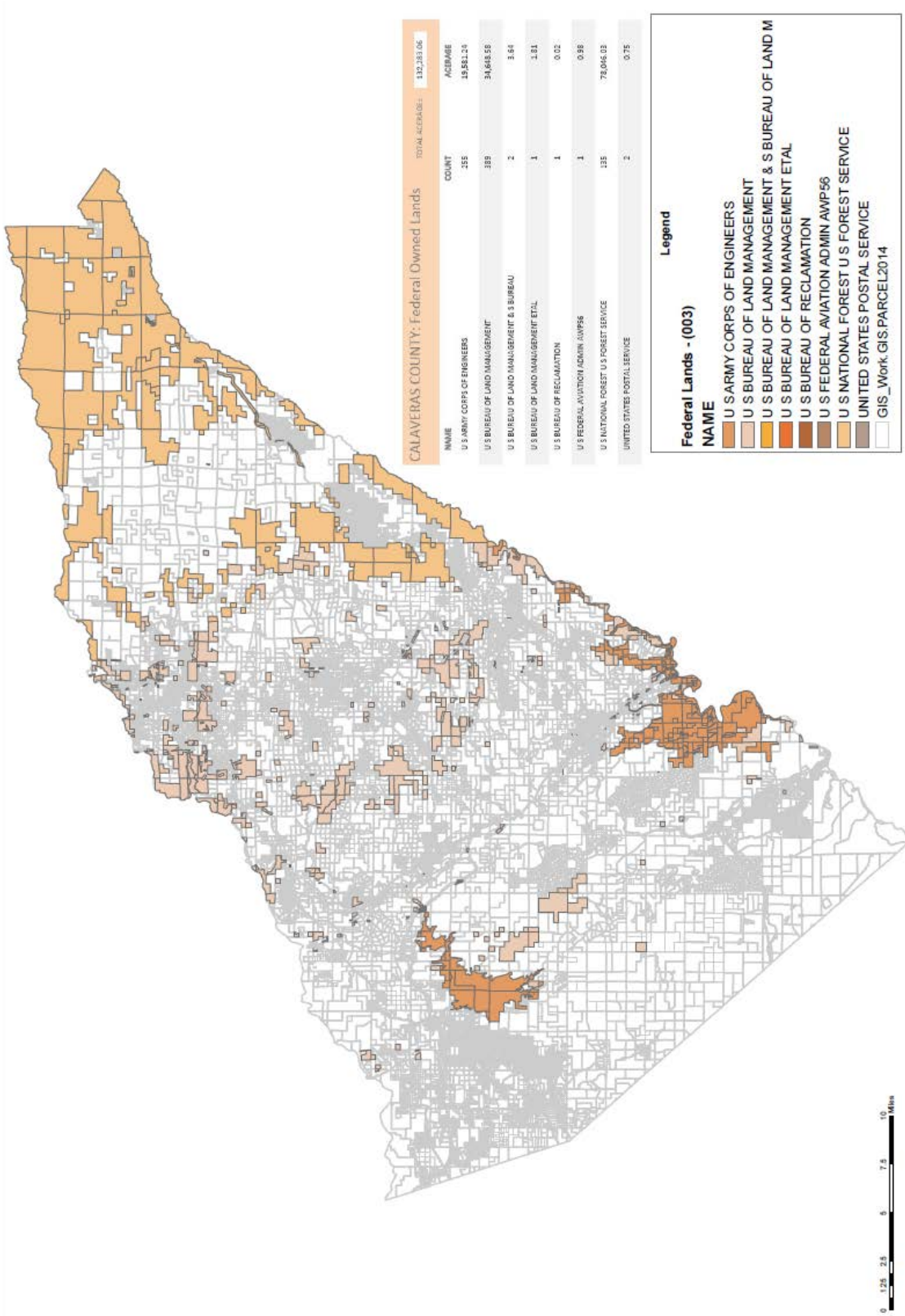


Figure 1-2 Calaveras County Land Ownership



1.3.1. History

Calaveras County has been inhabited for many thousands of years and the Miwok and Washoe are two of the more recent Native American tribes. Calaveras is named for the Spanish word meaning skulls, reportedly for the bones of fighters left behind after a war amongst Native Americans that were discovered by Captain Gabriel Moraga. European settlers migrating westward across the U.S. began arriving in the western portion of Calaveras County the first half of the 19th century.

The discovery of gold in the region in the mid-19th century was unquestionably the most important development of the modern history of the County. Gold mining fostered a robust economy and spurred the formation of the towns, many of which are still present. Changes in land use after the end of the Gold Rush were relatively minor, until the growth of outdoor recreation beginning in the 1960's. Visitors seeking recreation and open space have created major changes in the area's economy and land use patterns. The rapid growth of subdivisions in recent decades, including both seasonal and permanent homes, has resulted from these demands.

1.3.2. Geography and Climate

Calaveras County is situated in central California on the western slopes of the Sierra Nevada Range, roughly 100 miles east of the San Francisco Bay area and 350 miles north of Los Angeles. The planning area covers 1,037 square miles ranging from low foothills on the northeastern fringe of the San Joaquin Valley to forested high elevations in the eastern portion of the County. Together with neighboring foothill counties, Calaveras County forms a central part of the Mother Lode Region, an area with remarkably rich mineral deposits.

Calaveras County's climate is influenced by prevailing westerly weather patterns and transitional topographic aspects between San Joaquin Valley and the Sierra Nevada. Climate varies significantly due to great differences in elevation, ranging from 300 feet in the western portion to over 8,000 feet near the border with Alpine County. Temperatures in the higher country generally range from the low 20s to the middle 80s. The lower foothills range in temperature from the low 30s to the high 90s, exceeding 100 degrees at times during the summer months.

Precipitation generally increases with altitude. Average precipitation is 20 inches a year in the western region to 60 inches in the northeast. The rainy season is October 1 through May 1. Snow accounts for much of the precipitation in the higher elevations (up to 300 inches per year), while snowfall is rare in the foothills.

1.3.3. Population

The California Department of Finance (DOF) population estimate for Calaveras County for July 1, 2014 was 45,079.

1.3.4. Economy

Calaveras County's economy is based in six main sectors: tourism and recreation; forest products; mineral extraction and processing; agriculture; private business; and the public sector. Economic characteristics for Calaveras County compared to California and the U.S. overall are shown in Table 1-1.

Table 1-1 Calaveras County—Civilian Employed Population 16 and Over

Industry	Estimated Employment	Percent
Agriculture, forestry, fishing and hunting, and mining	395	2.2%
Construction	1,683	9.6%
Manufacturing	1,069	6.1%
Wholesale trade	353	2.0%
Retail trade	2,128	12.1%
Transportation and warehousing, and utilities	1,180	6.7%
Information	368	2.1%
Finance and insurance, and real estate and rental and leasing	649	3.7%
Professional, scientific, and management, and administrative and waste management services	1,360	7.7%
Educational services, and health care and social assistance	4,340	24.7%
Arts, entertainment, and recreation, and accommodation and food services	1,524	8.7%
Other services, except public administration	965	5.5%
Public administration	1,584	9.0%

Source: U.S. Census Bureau American Community Survey 2009-2013

Table 1-2 identifies individual major employers, located in Calaveras County in 2014, according to the Employment Development Department. It is worth noting that many of the largest employers have a large number of seasonal jobs. In addition, although it is not located in Calaveras County, the Jackson Rancheria Casino located off State Route 88 outside of the City of Jackson is a major employer for Calaveras County residents as is the Bear Valley Ski Area which provides seasonal employment in neighboring Alpine County.

Table 1-2 Calaveras County – Major Employers

Employer	Number of Employees/b/
Calaveras County Government /d/	250-499
California Dpt. of Forestry and Fire Protection	250-499
Mark Twain St. Joseph's Hospital /a/	250-499
Bret Harte High School	100-249
Ironstone Vineyards	100-249
Mark Twain Convalescent Hospital	100-249
Rite-of-Passage-Sierra Ridge Academy	100-249

Employer	Number of Employees/b/
Big Trees Market	50-99
Calaveras County Office of Human Services (The Resource Connection)	50-99
Calaveras County Sheriff	50-99
Calaveras County Water District	50-99
Calaveras High School	50-99
Calaveras Lumber	50-99
California Pavement Maintenance Company	50-99
Foothill Village/c/	50-99
Independent Learning Center	50-99
Jenny Lind Elementary School	50-99
Mar-Val Food Stores	50-99
Railroad Flat Elementary School	50-99
Saddle Creek Resort	50-99
West Point Elementary School	50-99
World mark by Wyndham	50-99
Oars Raft Trips (Seasonal)	50-99
39th Agricultural Association (Seasonal)	50-99
United Parcel Service	50-99
Caltrans (seasonal)	50-99
Pacific Gas & Electric	50-99

Source: Employment Development Department, American Labor Market Information System (LMIS) 2014
/a/ Also known as Mark Twain Medical Center, a member of Dignity Health
/b/ Numbers represent estimates only
/c/ Within the Angels Camp City Limits
/d/ Normally 454-475 full time/regular employees. Total excludes temporary hires.

1.4 Plan Organization

The Calaveras County Multi-Hazard Mitigation Plan is organized as follows:

- Chapter 1: Introduction
- Chapter 2: What's New
- Chapter 3: Planning Process
- Chapter 4: Risk Assessment
- Chapter 5: Mitigation Strategy
- Chapter 6: Plan Adoption
- Chapter 7: Plan Implementation and Maintenance
- Annex A: Angels Camp
- Appendices

Chapter 2 What's New

Requirements §201.6(d)(3): A local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval within 5 years in order to continue to be eligible for mitigation project grant funding.

The 2010 Calaveras County Local Hazard Mitigation Plan contained a detailed description of the planning process, a risk assessment of identified hazards for the Calaveras County planning area, and an overall mitigation strategy for reducing risk and vulnerability from these hazards. Since approval of the plan by FEMA, progress has been made by Calaveras County and the City of Angels Camp on implementation of the mitigation strategy. As part of this 2015 LHMP Update, a thorough review and update of the 2010 plan was conducted to ensure that this update reflects current community conditions and priorities in order to realign the overall mitigation strategy for the next five-year planning period. This section of the plan includes the following:

- What's New in the Plan Update. This section provides an overview of the approach to updating the plan and identifies new analyses, data and information included in this plan update to reflect current community conditions This includes a summary of new hazard and risk assessment data as it relates to the Calaveras County Planning Area as well as information on current and future development trends affecting community vulnerability and related issues. The actual updated data, discussions, and associated analyses are contained in their respected sections within this 2015 LHMP Update.
- 2010 Mitigation Strategy Status and Successes. This section provides a description of the status of mitigation actions from the 2010 plan and also indicates whether a project is no longer relevant or is recommended for inclusion in the updated 2015 mitigation strategy. This section also highlights mitigation successes of the County and participating jurisdictions since the 2010 LHMP.

Collectively this What's New section provides documentation of Calaveras County and each participating jurisdiction's progress or changes in their risk and vulnerability to hazards and their overall hazard mitigation program. Completion of this 2015 LHMP Update further provides documentation of the Calaveras County community's continued commitment and engagement in the mitigation planning process.

2.1 What's New in the Plan Update

This LHMP update involved a comprehensive review and update of each section of the 2010 plan and includes an assessment of the success of the participating communities in evaluating, monitoring and implementing the mitigation strategy outlined in the initial plan. Only the information and data still valid from the 2010 plan was carried forward as applicable into this LHMP update. . In fact, based in part on the issuance of new 2011 and 2013 planning guidance, this 2015 plan has been significantly updated and rewritten.

Also to be noted, Chapter 7 Implementation and Maintenance of this plan update identifies key requirements for updating future plans:

- Consider changes in vulnerability due to action implementation;
- Document success stories where mitigation efforts have proven effective;
- Document areas where mitigation actions were not effective;
- Document any new hazards that may arise or were previously overlooked;
- Incorporate new data or studies on hazards and risks;
- Incorporate new capabilities or changes in capabilities;
- Incorporate growth and development-related changes to inventories; and
- Incorporate new action recommendations or changes in action prioritization.

These requirements and others as detailed throughout this plan were also addressed during this plan update process.

As part of its 2010 Mitigation Strategy, Calaveras County and participating jurisdictions recognized that certain data, if available, would enhance the analyses presented in the risk assessment and utilized in the development of the mitigation strategy. This new data and associated analysis provided valuable input for the development of the mitigation strategy presented in Chapter 4 of this plan.

New information and analyses contained throughout this plan update includes the following:

- A new assessment of hazards affecting the County was completed resulting in the inclusion of two additional hazards: agricultural hazards and severe weather: heavy rains and storms.
- An entire rework of the risk assessment for each identified hazard. This included reworking the hazard profile and adding new hazard event occurrences; redoing the entire vulnerability analysis to add items identified below and updating the vulnerability assessment based on more recent hazard data as well as using the most current parcel and assessor data for the existing built environment.
- An update of the flood hazard analysis utilizing the 2010 DFIRMs to include an updated analysis of the 100-year flood, an analysis of the 500-year flood, and an enhanced analysis of the localized/stormwater flooding problems affecting the planning area, including the use of the Best Available Maps (BAM) compiled by the state.
- Development of an updated critical facility definition and a GIS mapping effort of critical facilities for the planning area.
- An enhanced vulnerability assessment which updated the inventory of total assets at risk utilizing GIS and County Assessor Parcel data.
- Greater analysis was performed on the wildfire hazard utilizing Cal Fire, Fire Severity GIS data.
- An enhanced vulnerability assessment which added an analysis of populations vulnerable to two priority hazards: flood and wildfire.
- An enhanced vulnerability assessment which added an analysis of future development in the planning area and specific to each of the mapped hazards.
- Incorporation and analysis of the new 2010 Census data was utilized for this LHMP update.
- An analysis of the incorporation of the 2010 LHMP into other planning mechanisms in the County and City of Angels Camp was performed.
- Also, as required by the 2008 planning guidance, an analysis of each jurisdictions' ongoing and continued compliance with the NFIP.

2.2 2010 Mitigation Strategy Status and Successes

Calaveras County and Angels Camp have been successful in implementing actions identified in the 2010 LHMP Mitigation Strategy, thus, working diligently towards meeting their 2010 goals.

2.2.1. Past Mitigation Action Update

The 2010 mitigation strategy contained 7 separate mitigation actions benefiting one or more communities within the Calaveras County Planning Area. Of these 7 actions, all are ongoing and have been identified for inclusion in this plan update. Table 2-1 provides a status summary of the mitigation action projects from the 2010 LHMP. Following the table are detailed descriptions of the status of each project.

Table 2-1 Calaveras County 2010 LHMP Update: Mitigation Action Status

Jurisdiction/Hazard/Action	Complete	Ongoing	Not Yet Started	Project in 2015 Update
Calaveras County				
Integrate Local Hazard Mitigation Plan into Safety Element of General Plan*	X	X		X
Develop and Conduct a Multi-Hazard Seasonal Public Awareness Program*		X		X
Identify Critical Facilities/Infrastructure Needing Backup Power Sources*		X		X
Improve Channel Maintenance and Upkeep to Prevent Debris Build-up at Road Bridges*		X		X
Implement Fuel Reduction along County Right of Ways*		X		X
Identify Storm Water Flooding Projects*		X		X
City of Angels Camp				
Integrate Local Hazard Mitigation Plan into Safety Element of General Plan*		X	X	X

*Indicates protection of both existing and new development, buildings, and infrastructure.

Calaveras County Actions

Integrate Local Hazard Mitigation Plan into Safety Element of General Plan*

Progress to Date: The 2010 LHMP was incorporated into the Safety Element of the 2014 General Plan. When the General Plan is updated, the Safety Element will again incorporate the LHMP Update. This action will carry forward in the Plan Update.

Develop and Conduct a Multi-Hazard Seasonal Public Awareness Program*

Multi-Hazard Awareness and Public Outreach is an ongoing project with the County. The County website maintains information on hazards, risk and preparedness and also provides links to FEMA and other websites for additional information. Other online tools include maintaining current information, including that related to current disaster events such as human and animal evacuations and sheltering information and other critical information related to available resources. Internal outreach to County departments is always ongoing and most recently included presentations regarding active shooter incidents and sheltering options.

Progress to Date: Each year County OES conducts seasonal hazard briefings for the Multiagency Coordinating Group (MAC). Each spring the MAC presents and reviews wildland fire planning and response plans, while in the fall the MAC reviews flood response plans.

Identify Critical Facilities/Infrastructure Needing Backup Power Sources*

This is an ongoing effort of the County to identify critical infrastructure and determine needs/projects related to these. Specific projects include:

With respect to identifying critical infrastructure needing backup power, the County Department of Public Heath as part of the FY15 Homeland Security Grant is obtaining a backup generator for the Health and Human Services Building.

The County is also working with PG&E as a result of the recent Butte Fire to identify critical infrastructure priorities for getting power back online.

As part of this 2015 LHMP Update, a new Critical Facility definition was developed by the County and County GIS developed a first draft of a critical facility layer meeting the new definition. A critical facility inventory and hazard analysis using this layer is detailed in Chapter 4 –Risk Assessment of this LHMP. This layer will be updated and maintained as necessary to keep current.

Progress to Date: Ongoing subject to annual funding.

Improve Channel Maintenance and Upkeep to Prevent Debris Build-up at Road Bridges*

Channel maintenance is an ongoing priority of County Public Works and is done during key times to reduce flooding issues. For example, channel maintenance is a priority during the fall to prepare for the upcoming rainy season. Cosgrove Creek is an example where channel maintenance is a high priority to reduce neighborhood flooding of structures.

Progress to Date: The County Public Works Department coordinates an annual channel vegetation clearance program for both Cosgrove Creek and San Andreas Creek to improve stream flows and reduce flooding during the winter months. The program is administered through the California Department of Fish and Game, U.S. Wildlife Service, and National Resource Conservation Service.

Implement Fuel Reduction along County Right of Ways*

The County Road and Environmental Health Department does fuels reduction on County properties including ROWs on an ongoing basis. One program utilizes Calaveras County inmates for fuels mitigation on County lands.

Progress to Date: Program is ongoing and will be carried forward in this Plan Update.

Identify Storm Water Flooding Projects*

Progress to Date: The County continues to research sources of available funding to implement flood mitigation measures identified for Cosgrove Creek. (Cosgrove Creek has been the source of flood mitigation planning for several years. The U.S. Wildlife Service, California Fish and Game, the U.S. Army Corps of Engineers, and the National Resource Conservation Service have jointly partnered together to research planning options and their costs.) Funding is pending.

City of Angels Camp Actions

Integrate Local Hazard Mitigation Plan into Safety Element of General Plan

Progress to Date: The City did not adopt the 2010 LHMP into the General Plan, due to difficulties in the process of amending the General Plan. In the next General Plan update, the LHMP will be incorporated into the Safety Element of the General Plan.

Chapter 3 Planning Process

Requirements §201.6(b) and §201.6(c)(1): An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:
1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;
2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia, and other private and nonprofit interests to be involved in the planning process; and
3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.
[The plan shall document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

Calaveras County Office of Emergency Services (County OES) recognized the need and importance of the update process for their local hazard mitigation plan update and initiated its development. After receiving a Homeland Security Grant, which served as the primary funding source for this plan, the County contracted with Foster Morrison Consulting (Foster Morrison) to facilitate and develop the plan. Jeanine Foster, a professional planner with Foster Morrison, was the project manager and lead planner in charge of overseeing the planning process and the development of this LHMP update. The Foster Morrison team's role was to:

- Assist in establishing the Hazard Mitigation Planning Committee (HMPC) as defined by the Disaster Mitigation Act (DMA) of 2000;
- Meet the DMA requirements as established by federal regulations and following FEMA's planning guidance;
- Support objectives under the National Flood Insurance Program's Community Rating System and the Flood Mitigation Assistance program;
- Facilitate the entire planning process;
- Identify the data requirements that HMPC participants could provide and conduct the research and documentation necessary to augment that data,
- Assist in facilitating the public input process;
- Produce the draft and final plan documents; and
- Coordinate with the California Office of Emergency Services (Cal OES) and FEMA Region IX plan reviews.

3.1 Local Government Participation

The DMA planning regulations and guidance stress that each local government seeking FEMA approval of their mitigation plan must participate in the planning effort in the following ways:

- Participate in the process as part of the HMPC;
- Detail where within the planning area the risk differs from that facing the entire area;
- Identify potential mitigation actions; and
- Formally adopt the plan.

For the Calaveras County Planning Area's HMPC, "participation" meant the following:

- Providing facilities for meetings;
- Attending and participating in the HMPC meetings;
- Completing and returning the data collection worksheets;
- Collecting and providing other requested data (as available);
- Managing administrative details;
- Making decisions on plan process and content;
- Updating the status of mitigation actions from the 2010 plan;
- Identifying mitigation actions for the this plan update;
- Reviewing and providing comments on plan drafts; including annexes
- Informing the public, local officials, and other interested stakeholders about the planning process and providing opportunity for them be involved in the planning process and to comment on the plan;
- Coordinating, and participating in the public input process; and
- Coordinating the formal adoption of the plan by the governing boards.

The County and City of Angels Camp seeking FEMA plan approval met all of these participation requirements. In most cases one or more representatives for each jurisdiction attended the HMPC meetings described in Table 3-2 and also brought together a local planning team to help collect data, identify mitigation actions and implementation strategies, and review and provide data on plan drafts. Appendix A provides additional information and documentation of the planning process.

3.2 The 10-Step Planning Process

Foster Morrison established the planning process for updating the Calaveras County Local Hazard Mitigation Plan using the DMA planning requirements and FEMA's associated guidance. This guidance is structured around a four-phase process:

1. Organize Resources;
2. Assess Risks;
3. Develop the Mitigation Plan; and
4. Implement the Plan and Monitor Progress.

Into this process, Foster Morrison integrated a more detailed 10-step planning process used for FEMA's Community Rating System (CRS) and Flood Mitigation Assistance programs. Thus, the modified 10-step process used for this plan meets the requirements of six major programs: FEMA's Hazard Mitigation Grant Program; Pre-Disaster Mitigation program; Community Rating System; Flood Mitigation Assistance Program; Severe Repetitive Loss program; and new flood control projects authorized by the U.S. Army Corps of Engineers.

Table 3-1 shows how the modified 10-step process fits into FEMA's four-phase process. The sections that follow describe each planning step in more detail.

Table 3-1 Mitigation Planning Processes Used to Develop the Calaveras County Local Hazard Mitigation Plan

DMA Process	Modified CRS Process
1) Organize Resources	
201.6(c)(1)	1) Organize the Planning Effort
201.6(b)(1)	2) Involve the Public
201.6(b)(2) and (3)	3) Coordinate with Other Departments and Agencies
2) Assess Risks	
201.6(c)(2)(i)	4) Identify the Hazards
201.6(c)(2)(ii)	5) Assess the Risks
3) Develop the Mitigation Plan	
201.6(c)(3)(i)	6) Set Goals
201.6(c)(3)(ii)	7) Review Possible Activities
201.6(c)(3)(iii)	8) Draft an Action Plan
4) Implement the Plan and Monitor Progress	
201.6(c)(5)	9) Adopt the Plan
201.6(c)(4)	10) Implement, Evaluate, and Revise the Plan

This LHMP update involved a comprehensive review and update of each section of the 2010 plan and includes an assessment of the success of the participating communities in evaluating, monitoring and implementing the mitigation strategy outlined in the initial plan, as previously described in more detail in Chapter 2 and throughout Chapters 4 and 5. The process followed to update the plan is detailed in the above table and the sections that follow. As part of this plan update, all sections of the plan were reviewed and updated to reflect new data, processes, and resulting mitigation strategies. Only the information and data still valid from the 2010 plan was carried forward as applicable into this LHMP update.

3.2.1. Phase 1: Organize Resources

Planning Step 1: Organize the Planning Effort

With Calaveras County's commitment to participate in the DMA planning process, Foster Morrison worked with the Calaveras County OES to establish the framework and organization for development of the plan. Organizational efforts were initiated with the County and City of Angels Camp to inform and educate the plan participants of the purpose and need for updating the countywide hazard mitigation plan.

An initial conference call was held with County OES to discuss the organizational aspects of this plan update process and to plan the kickoff meeting. Invitations to this kickoff meeting were extended to key county departments, the City of Angels Camp, representatives from special districts for the county and

cities, as well as to other federal, state, and local stakeholders, including representatives from the public, that might have an interest in participating in the planning process. Representatives from participating jurisdictions and HMPC members to the 2010 plan were used as a starting point for the invite list, with additional invitations extended as appropriate throughout the planning process. The list of initial invitees is included in Appendix A.

The HMPC was established as a result of these discussions with the County, as well as through interest generated through the initial outreach and kickoff/public meeting conduced for this project as detailed later in this section. The HMPC, comprising key county, city, special district, and other government and stakeholder representatives, developed the plan with leadership from County OES and facilitation by Foster Morrison. Each participating jurisdiction seeking FEMA approval of the plan had representation on the HMPC. Participating jurisdictions also indicated their commitment to participate as evidenced by executing a letter of commitment at the beginning of the planning process. Letters of commitment for participating jurisdictions are included in Appendix A. The following participated on the HMPC:

Calaveras County*

- Calaveras Office of Emergency Services
- Calaveras County Sheriff's Office
- Calaveras County Planning Department
- Calaveras County Technology Services Department/GIS
- Calaveras County Building Department
- Calaveras County Environmental Management
- Calaveras County Air Pollution Control
- Calaveras County Animal Services
- Calaveras Public Utility District

Participating Cities

- City of Angels Camp*

Other Government and Stakeholder Representatives

- California Department of Forestry and Fire Protection (Cal Fire)
- Red Cross
- Pacific Gas & Electric
- Calaveras County Water District
- Calaveras County Fire Safe Council
- Calaveras Consolidated, Cal-Co Fire
- Mark Twain Hospital

*indicates that jurisdiction is also a participating jurisdiction seeking FEMA approval of this plan.

A list of participating HMPC representatives is included in Appendix A. This list details all HMPC members that attended one or more HMPC meetings detailed in Table 3-2. Each participating jurisdiction also utilized the support of many other support staff in order to collect and provide requested data and to conduct timely reviews of the draft documents. Note that the above list of HMPC members also includes

several other government and stakeholder representatives that contributed to the planning process. Specific participants from these other agencies are also identified in Appendix A.

Meetings

The planning process officially began with a kick-off meeting held in Calaveras County, on March 18, 2015, followed by a public kick-off meeting held the same day at 5 pm. The meeting covered the scope of work and an introduction to the DMA requirements. Participants were provided with data collection worksheets to facilitate the collection of information necessary to support development of the plan. Using FEMA guidance, Foster Morrison designed these worksheets to identify hazards of concern to each of the participating jurisdictions, capture information on past hazard events, identify and quantify, where feasible, assets and values at risk to identified hazards, inventory existing capabilities, and record possible mitigation actions. Copies of Foster Morrison's data collection worksheets for this project is included in Appendix A. Because this is a plan update, another worksheet was developed, the Mitigation Action Status Summary Worksheet, to capture information on the current status of mitigation action items included in the 2010 plan. This worksheet is also included in Appendix A. The County and each jurisdiction seeking FEMA approval of this plan update completed and returned the worksheets to Foster Morrison for incorporation into the plan document.

During the planning process, the HMPC communicated through face-to-face meetings, email, telephone conversations, and through the County website. The County website included information for all stakeholders on the LHMP update process. Draft documents were also posted on this website so that the HMPC members and the public could easily access and review them. The LHMP website can be accessed at:

- calaverasgov.us

The HMPC met three times during the planning period (March 18, 2015–July 16, 2015). The purposes of these meetings are described in Table 3-2. Agendas for each of the meetings are included in Appendix A.

Table 3-2 HMPC Meetings

Meeting Type	Meeting Topic	Meeting Date(s)
HMPC #1	Kick-off meeting: introduction to DMA, the planning process, and hazard identification	March 18, 2015
HMPC #2	Risk assessment overview and work session/Development of mitigation goals and objectives	July 15, 2015
HMPC #3	Finalization of mitigation goals and objectives/ Development and prioritization of mitigation recommendations	July 16, 2015

Planning Step 2: Involve the Public

Early discussions with the Calaveras County OES established the initial plan for public involvement to ensure a meaningful public process. Public outreach for this plan update began at the beginning of the plan development process with an informational press release to inform the public of the purpose of the DMA

and the hazard mitigation planning process for the Calaveras County Planning Area and to invite the public to a public education/outreach meeting held the evening of the kickoff meeting for the project. At the kick-off meeting, the group discussed additional strategies for public involvement and agreed to an approach using established public information mechanisms and resources within the community. Public involvement activities for this plan update included press releases; website postings; stakeholder and public meetings; and the collection of public and stakeholder comments on the draft plan which was posted on the County website. Information provided to the public included an overview of the mitigation status and successes resulting from implementation of the 2010 plan as well as information on the processes, new risk assessment data, and proposed mitigation strategies for the plan update.

A stakeholder/public meeting was held at the beginning of the plan development process and the plan was placed on the County website and noticed for public review and comment prior to finalizing the updated plan as further described in Table 3-3. If appropriate, stakeholder and public comments and recommendations would be incorporated into the final plan, including the sections that address mitigation goals and strategies. However, no public comments were received during the plan development process and prior to plan finalization.

All press releases and website postings are on file with the Calaveras County OES (see Figure 3-1 for an example of a press release). The public meeting and the opportunity to review and comment on the draft plan were advertised in a variety of ways to maximize outreach efforts to both targeted groups and to the public at large. Advertisement mechanisms for these meetings and for involvement in the overall LHMP development process include:

- Development and publishing of an LHMP public outreach article (prior to the first public meeting) in the *Calaveras Enterprise* advising people on how to participate in the LHMP Update and directing them to the County LHMP Update webpage. See Appendix A for a copy of this article.
- Development of a press release inviting the public to comment was created. Pinetree.net advertised the public review comment period, and directed the public to the website where the document was located. The press release is contained in Appendix A. No public comments were received,
- Providing press releases to local newspapers and radio stations:
- Posting meeting announcements on the local County LHMP website
- Email to established email lists
- Personal phone calls

The public outreach activities described in Table 3-3 were conducted with participation from and on behalf of all jurisdictions participating in this plan.

Table 3-3 Schedule of Public and Stakeholder Meetings

Meeting Topic	Meeting Dates	Meeting Locations
Public meeting: Introduction to DMA and the Hazard Mitigation Planning Process	March 18, 2015	Board of Supervisors' Chambers

Figure 3-1 Example of Press Releases Used to Involve the Public

March 3, 2015

FOR IMMEDIATE RELEASE

CONTACT: Sherri Munson, Calaveras County OES, 209-754-2888

CALAVERAS COUNTY INVITES PARTICIPATION IN HAZARD MITIGATION PLAN UPDATE

Calaveras County is leading a Local Hazard Mitigation Plan (LHMP) Update to their 2010 plan. The purpose of this LHMP Update is to assess risk to natural hazards such as floods, wildfires, and severe weather events; implement actions to reduce future losses; and maintain eligibility for federal mitigation funds in accordance with the Disaster Mitigation Act of 2000. Partnering with the County in this planning effort is the City of Angels Camp.

Nationwide, taxpayers pay billions of dollars annually helping communities, organizations, businesses, and individuals recover from disaster. Some disasters are predictable and, in many cases, much of the damage can be reduced or even eliminated through mitigation planning.

The Calaveras County Office of Emergency Services (OES) will be hosting two meetings to kick off the process to update their current 2010 LHMP. Officials from Calaveras County, the City of Angels Camp, state and local agencies, members of the public, and other interested stakeholders are invited to participate in this planning effort. A hazard mitigation planning committee will be established as part of the plan development process.

Separate meetings are scheduled for 2 p.m. (planning committee meeting) and 5 p.m. (public meeting) on Wednesday, March 18, 2015 at the Board of Supervisors room, 891 Mountain Ranch Road, San Andreas, CA 95249.

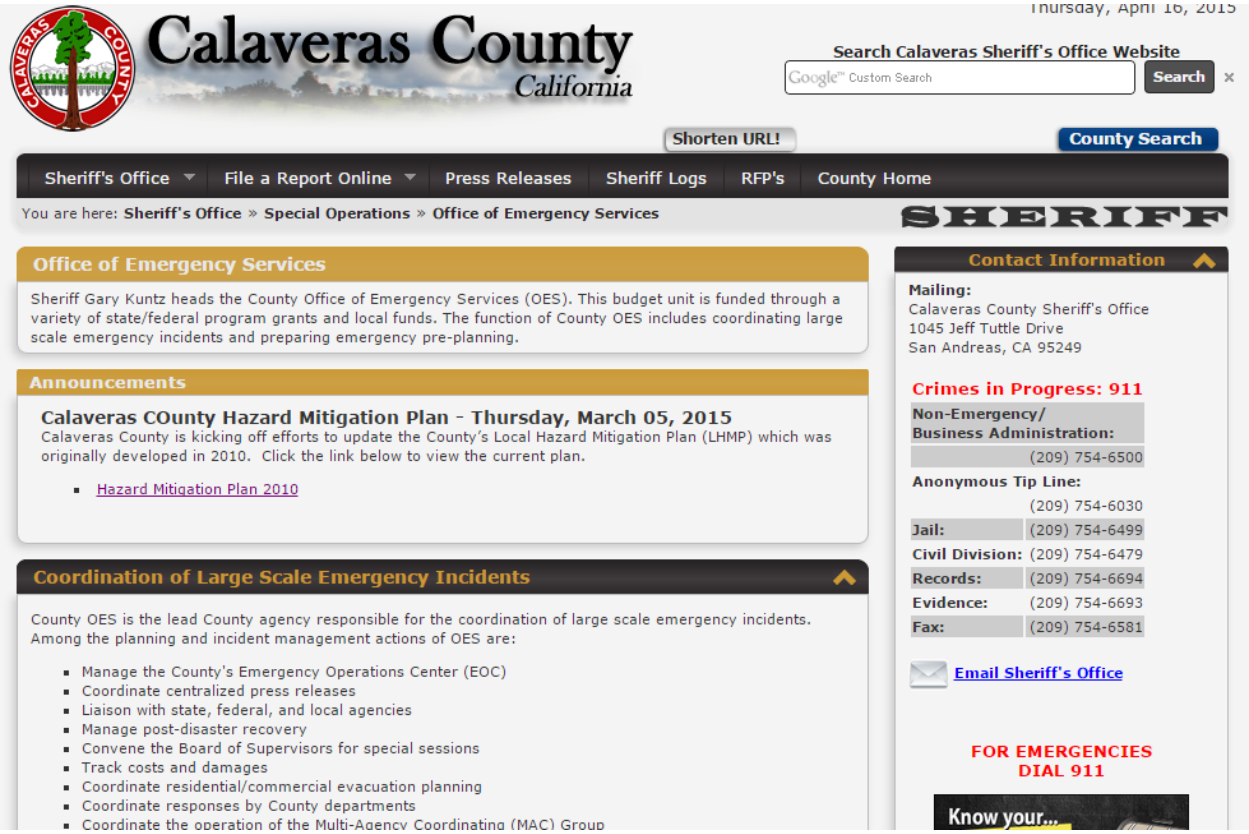
The 2 p.m. meeting is targeted for the planning committee; the 5 p.m. meeting is targeted for the public. However, the public is encouraged to come to either meeting at their convenience. The purpose of the kickoff meetings is to inform the planning committee, participating jurisdictions, and other interested stakeholders about the purpose and process of the plan and to describe how to participate and the benefits of doing so.

Calaveras County OES is taking the initiative to develop this plan update utilizing the expertise of consultants with Foster Morrison Consulting, Ltd., a firm that specializes in hazard mitigation and emergency management. Please come to the kickoff meeting to learn more about hazard mitigation and the LHMP Update process.

For more information on this project and how you can be involved, contact Sherri Munson at 209-754-2888 or SMunson@co.calaveras.ca.us.

Source: Calaveras County

Figure 3-2 Calaveras County Hazard Mitigation Plan Webpage



Planning Step 3: Coordinate with Other Departments and Agencies

Early in the planning process, the HMPC determined that data collection, risk assessment analyses, mitigation strategy development, and plan approval would be greatly enhanced by inviting other local, state and federal agencies and organizations to participate in the process. Based on their involvement in hazard mitigation planning, their landowner status in the County, and/or their interest as a neighboring jurisdiction, representatives from the following groups were invited to participate on the HMPC:

- Calaveras County and all Agencies
- City of Angels Camp
- Calaveras Fire Safe Council
- CAL-FIRE
- Calaveras County Water District
- Calaveras County Public Utility District
- Cal OES
- CA-DWR Floodplain Management
- Cal-Trans
- CA-DWR Division of Dam Safety
- LAFCO
- Pacific Gas & Electric

- Red Cross
- US Forest Service
- US Bureau of Land Management
- NWS/NOAA
- U.S. Army Corps of Engineers
- FEMA Region IX

Coordination with key agencies, organizations, and advisory groups throughout the planning process allowed the HMPC to review common problems, development policies, and mitigation strategies as well as identifying any conflicts or inconsistencies with regional mitigation policies, plans, programs and regulations. For example, in conjunction with the kick off meetings, several key stakeholder/agency conversations were held at the beginning of the project to solicit input and to identify and obtain data at the beginning of the project. This included initial discussions with: Cal OES, DWR, Cal Fire, and the Calaveras County Water District. Coordination with these key agencies continued throughout the project. For example, representatives from Cal OES attended most of the HMPC meetings where they helped present, answered questions and provided input and support on the LHMP process and plan requirements and provided details as requested on other related programs, such as FEMA grant programs. Likewise, DWR was utilized to obtain data on other flood and water resource programs within the region as well as to access information on the NFIP specific to the planning area and participating jurisdictions. The Calaveras County Fire Safe Council provided detailed information on the status of wildfire mitigation within the County. Also through their attendance at HMPC meetings these key stakeholders and agencies provided ongoing information and data as requested to support the overall plan development process.

As part of the public review and comment period for the draft plan, key stakeholders and agencies were again specifically solicited to provide any final input to the draft plan document. This input was solicited both through membership on the LHMP committee and by direct emails to key groups and associations to review and comment on the plan. As part of this targeted outreach, these key stakeholders were also specifically invited to attend the final public meetings to discuss any outstanding issues and to provide input on the draft document and final mitigation strategies.

In addition, through the public meetings conducted at the beginning of the planning process, members of the public and stakeholders were invited to participate through public outreach activities. Some of these people participated on the HMPC. More information is shown in Appendix A.

The HMPC also used technical data, reports, and studies from the following agencies and groups:

- CAL OES
- CAL FIRE
- California Department of Finance
- California Department of Fish and Game.
- California Department of Forestry and Fire Protection.
- California Department of Water
- California Geological Survey
- California Register of Historic Places
- FEMA
- Library of Congress

- National Oceanic and Atmospheric Association
- National Performance of Dams Program
- National Register of Historic Places
- National Resource Conservation Service
- National Weather Service
- Spatial Hazard Events and Losses Database for the United States (SHELDUS)
- United States Army Corps of Engineers
- United States Bureau of Land Management
- United States Department of Agriculture
- United States Drought Impact Reporter
- United States Farm Service Agency
- United States Forestry Service
- United States Geological Survey
- Western Regional Climate Center

These and other documents were reviewed and considered, as appropriate, during the collection of data to support Planning Steps 4 and 5, which include the hazard identification, vulnerability assessment, and capability assessment. Data from these plans and ordinances were incorporated into the risk assessment and hazard vulnerability sections of the plan. Where the data from the existing studies and reports is used in this plan update, the source document is referenced throughout this plan update. The data was also used in determining the capability of the community in being able to implement certain mitigation strategies. Appendix B References provides a detailed list of references used in the preparation of this plan update.

Several opportunities were provided for the groups listed above to participate in the planning process. At the beginning of the planning process, invitations were extended to these groups to actively participate on the HMPC. Specific participants from these groups are detailed in Appendix A. Others assisted in the process by providing data directly as requested in worksheets or through data contained on their websites or as maintained by their offices. Further as part of the public outreach process, all groups were invited to attend the public meetings and to review and comment on the plan prior to submittal to Cal OES and FEMA.

Other Community Planning Efforts and Hazard Mitigation Activities

Coordination with other community planning efforts is also paramount to the success of this plan. Hazard mitigation planning involves identifying existing policies, tools, and actions that will reduce a community's risk and vulnerability to hazards. Calaveras County uses a variety of comprehensive planning mechanisms, such as general plans and ordinances, to guide growth and development. Integrating existing planning efforts and mitigation policies and action strategies into this plan establishes a credible and comprehensive plan that ties into and supports other community programs. The development of this plan incorporated information from the following existing plans, studies, reports, and initiatives as well as other relevant data from neighboring communities and other jurisdictions.

- Arnold Community Plan. 1998.
- Avery Pines Community Plan. 1998.
- Calaveras County Agricultural Commission Annual Reports.
- Calaveras County Community Wildfire Protection Plan. 2011.
- Calaveras County Emergency Operations Plan Draft. 2015.

- Calaveras County Flood Insurance Study. December 17, 2010.
- Calaveras County General Plan Draft. 2014.
- Calaveras County General Plan Background Report. 2014.
- California Drought Contingency Plan.
- California Volcanoes and Volcanics. U.S. Geological Survey, Cascades Volcano Observatory.
- Central Valley Flood Control Project.
- Cities/Counties Ranked by Size, Numeric, and Percent Change. State of California Department of Finance. 2014.
- Community Rating System. Federal Emergency Management Agency National Flood Insurance Program.
- Contingency Plan for Excessive Heat Emergencies – A Supporting Document to the State Emergency Plan, April 2010.
- Developing the Mitigation Plan: Identifying Mitigation Actions and Implementation Strategies. Federal Emergency Management Agency. FEMA 386-3. 2003.
- Ebbets Pass Special Plan. 1988.
- Enhanced Fujita Scale. National Oceanic and Atmospheric Administration Storm Prediction Center. 2007.
- Future Eruptions in California's Long Valley Area—What's Likely? U.S. Geological Survey. Fact Sheet 073-97. 1997.
- Getting Started: Building Support for Mitigation Planning. Federal Emergency Management Agency. FEMA 386-1. 2002.
- Hazard Mitigation Planning and Hazard Mitigation Grant Program. Federal Register. Interim Final Rule. February 26, 2002.
- HAZUS-MH 2.1. Federal Emergency Management Agency. 2012.
- Integrating Manmade Hazards into Mitigation Planning. Federal Emergency Management Agency. FEMA 386-7. 2003.
- Introduction to Hazard Mitigation. Federal Emergency Management Agency. FEMA IS-393.A. 2006.
- Mokelumne Hill Community Plan. 1988.
- Multi-Hazard Identification and Risk Assessment. Federal Emergency Management Agency. 1997.
- Murphy's Community Plan. 1998.
- Natural Hazard Mitigation Saves: An Independent Study to Assess the Future Savings from Mitigation Activities. National Institute of Building Science Multi-Hazard Mitigation Council. 2005.
- Oak Canyon Ranch Special Plan. 2008.
- Probabilistic Seismic Hazard Assessment for the State of California. California Geological Survey. Open-File Report 96-08. 1996.
- Rancho Calaveras Special Plan. 1999.
- Robert T. Stafford Disaster Relief and Emergency Act. Public Law 93-288, as amended, 42 U.S.C. 5121-5207. June 2007.
- Saddle Creek Special Plan. 2008.
- San Andreas Community Plan. 1988.
- Spatial Hazard Events and Losses Database for the United States. University of South Carolina Hazards Research Lab.
- State of California Multi-Hazard Mitigation Plan. California Emergency Management Agency. 2013.
- Strategic Fire Plan Tuolumne-Calaveras Unit. 2014.
- Tuolumne-Calaveras Unit Pre-Fire Management Plan. 2009.

- Understanding Your Risks: Identifying Hazards and Estimating Losses. Federal Emergency Management Agency. FEMA 386-2. 2001.
- Valley Springs Community Plan. 1974.

A key example of coordinating with other planning efforts is the coordination of this LHMP with local-CWPPs. This is critical for two important reasons. First, wildfires don't stop at corporate or jurisdictional boundaries and evaluating fire risk issues on a regional basis provides a comprehensive approach to understanding and addressing identified wildfire risk and vulnerability. Second, a successful mitigation strategy requires that these planning efforts be coordinated.

Many other local, state, and federal documents were reviewed and considered, as appropriate, during the collection of data to support Planning Steps 4 and 5, which include the hazard identification, vulnerability assessment, and capability assessment.

3.2.2. Phase 2: Assess Risks

Planning Steps 4 and 5: Identify the Hazards and Assess the Risks

Foster Morrison led the HMPC in a research effort to identify, document, and profile all the hazards that have, or could have, an impact on the planning area. Data collection worksheets and jurisdictional annexes were developed and used in this effort to aid in determining hazards and vulnerabilities and where the risk varies across the planning area. Geographic information systems (GIS) were used to display, analyze, and quantify hazards and vulnerabilities. The HMPC also conducted a capability assessment to review and document the planning area's current capabilities to mitigate the risk and vulnerability of each participating jurisdiction to each identified hazard. By collecting information about existing government programs, policies, regulations, ordinances, and emergency plans, the HMPC could assess those activities and measures already in place that contribute to mitigating some of the risks and vulnerabilities identified. A more detailed description of the risk assessment process, methodologies, and results are included in Chapter 4 Risk Assessment.

3.2.3. Phase 3: Develop the Mitigation Plan

Planning Steps 6 and 7: Set Goals and Review Possible Activities

Foster Morrison facilitated brainstorming and discussion sessions with the HMPC that described the purpose and process of developing planning goals and objectives, a comprehensive range of mitigation alternatives, and a method of selecting and prioritizing recommended mitigation actions using a series of selection criteria. This information is included in Chapter 5 Mitigation Strategy. Additional documentation on the process the HMPC used to develop the goals and strategy is in Appendix C.

Planning Step 8: Draft an Action Plan

Based on input from the HMPC regarding the draft risk assessment and the goals and activities identified in Planning Steps 6 and 7, Foster Morrison produced a complete first draft of the plan. This complete draft was posted for HMPC review and comment on the County website. Other agencies were invited to comment on this draft as well. HMPC and agency comments were integrated into the second public review

draft, which was advertised and distributed to collect public input and comments. Foster Morrison integrated comments and issues from the public, as appropriate, along with additional internal review comments and produced a final draft for the CAL OES and FEMA Region IX to review and approve, contingent upon final adoption by the governing boards of each participating jurisdiction.

3.2.4. Phase 4: Implement the Plan and Monitor Progress

Planning Step 9: Adopt the Plan

In order to secure buy-in and officially implement the plan, the plan was adopted by the governing boards of each participating jurisdiction using the sample resolution contained in Appendix D.

Planning Step 10: Implement, Evaluate, and Revise the Plan

The true worth of any mitigation plan is in the effectiveness of its implementation. Up to this point in the planning process, all of the HMPC's efforts have been directed at researching data, coordinating input from participating entities, and developing appropriate mitigation actions. Each recommended action includes key descriptors, such as a lead manager and possible funding sources, to help initiate implementation. An overall implementation strategy for this plan update is described in Chapter 7 Plan Implementation and Maintenance.

Finally, there are numerous organizations within the Calaveras County Planning Area whose goals and interests interface with hazard mitigation. Coordination with these other planning efforts, as addressed in Planning Step 3, is paramount to the ongoing success of this plan and mitigation in Calaveras County and is addressed further in Chapter 7. A plan update and maintenance schedule and a strategy for continued public involvement are also included in Chapter 7.

Implementation and Maintenance Process: 2010

The 2010 Calaveras County LHMP included a process for implementation and maintenance. This process as set forth in the 2010 plan was generally followed with some variation as further described.

The maintenance process called for an annual review by the Calaveras County Multi-Agency Coordinating (MAC) group, with a five-year written update to be submitted to Cal EMA and REMA Region IX. Although the MAC group was not officially used for this purpose and an annual review was not conducted in a formalized process, the nine objectives of the plan implementation and update process were accomplished through various other venues and means. These nine objectives are as follows:

- Monitor and evaluate the implementation of the plan on an annual basis at a regularly scheduled meeting and after a disaster event;
- Act as a forum for hazard mitigation issues;
- Disseminate hazard mitigation ideas and activities to all participants;
- Pursue the implementation of high priority, low- or no-cost recommended actions;
- Maintain vigilant monitoring of multi-objective, cost-share, and other funding opportunities to help the community implement the plan's recommended actions for which no current funding exists;
- Monitor and assist in implementation and update of this plan;

- Keep the concept of mitigation in the forefront of community decision making by identifying plan recommendations when other community goals, plans, and activities overlap, influence, or directly affect increased community vulnerability to disasters;
- Report on plan progress and recommended changes to the Calaveras County Board of Supervisors and the Angels Camp City Council; and
- Inform and solicit input from the public.

Following the 2010 plan adoption by the Board of Directors, the reviews and coordination were conducted on a more informal basis through emails, telephone conversations, and through attendance a various County, stakeholder, and other agency and department meetings. Calaveras County made a commitment to plan implementation through their collaboration with other local, state, and federal mitigation partners. The County continued to work in conjunction with the existing MAC group to address a variety of hazard and mitigation issues within the County, including those identified in the 2010 LHMP.

Their focus on implementation and maintenance of their 2010 plan is evident in that of the seven mitigation actions included in their 2010 mitigation strategy, all seven are ongoing in nature and are recommended for inclusion in this 2015 LHMP Update.

Incorporation of Hazard Mitigation Plan into Other Plans

Since the creation of the 2010 Calaveras County Local Hazard Mitigation Plan, other plans have been created. This includes General Plans, CWPPs, EOPs, other fire plans, or any other planning process. Table 3-4 shows how the 2010 LHMP was incorporated into or implemented through any other planning mechanism. Planning mechanisms that the 2010 LHMP was incorporated into for the City of Angels Camp is discussed in its annex to this Plan Update.

Table 3-4 Incorporation of Calaveras County LHMP into Other Planning Mechanisms

Jurisdiction	Planning Mechanism 2010 LHMP Was Incorporated/Implemented In. Details?
Calaveras County	The 2010 LHMP risk assessment and other data was used in the recent 2014 EOP Update that is currently under review and finalization
Calaveras County	The LHMP Wildfire Risk and Vulnerability Assessment was consulted in the development of the Tuolumne-Calaveras Unit Pre-Fire Management Plan.
Calaveras County	County Environmental Department & Public Health Division have consulted and utilized data and information from the 2010 LHMP in various programs and plans including areas related to water supply and well water, air quality, hazardous materials, as well as other information related to evacuation planning and sheltering of community residents, special populations, and the general public, including animals. Likewise, their involvement in this 2015 Plan Update will include incorporation of issues and mitigation action strategies under the purview of Environmental and Public Health Departments.
Calaveras County	A draft of the General Plan was released in Dec. 2014 for public comment. The Planning Commission is in the process of reviewing the draft. Staff will be working to incorporate applicable provisions of the LHMP into the Safety Element of the General Plan once it is adopted. Final adoption of the General Plan is expected in 2017.

Chapter 4 Risk Assessment

Requirement §201.6(c)(2): [The plan shall include] A risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.

As defined by the Federal Emergency Management Agency (FEMA), risk is a combination of hazard, vulnerability, and exposure. It is the impact that a hazard would have on people, services, facilities, and structures in a community and refers to the likelihood of a hazard event resulting in an adverse condition that causes injury or damage.

The risk assessment process identifies and profiles relevant hazards and assesses the exposure of lives, property, and infrastructure to these hazards. The process allows for a better understanding of a jurisdiction's potential risk to natural hazards and provides a framework for developing and prioritizing mitigation actions to reduce risk from future hazard events.

This risk assessment followed the methodology described in the FEMA publication *Understanding Your Risks—Identifying Hazards and Estimating Losses* (FEMA 386-2, 2002), which breaks the assessment down to a four-step process:

1. Identify Hazards;
2. Profile Hazard Events;
3. Inventory Assets; and
4. Estimate Losses.

Data collected through this process has been incorporated into the following sections of this chapter: Section 4.1 Hazard Identification: Natural Hazards identifies the natural hazards that threaten the planning area and describes why some hazards have been omitted from further consideration. Section 4.2 Hazard Profiles discusses the threat to the planning area and describes previous occurrences of hazard events and the likelihood of future occurrences. Section 4.3 Vulnerability Assessment assesses the planning areas' exposure to natural hazards; considering assets at risk, critical facilities, future development trends, and, where feasible, estimates potential hazard losses. Section 4.4 Capability Assessment inventories existing mitigation activities and policies, regulations, and plans that pertain to mitigation and can affect net vulnerability.

This risk assessment covers the entire geographical extent of the Calaveras County jurisdictional area, often referred to in this document as the planning area.

This LHMP update involved a comprehensive review and update of each section of the 2010 risk assessment. As part of the risk assessment update, new data was used, where available, and new analyses were conducted. Where data from existing studies and reports was used, the source is referenced throughout this risk assessment. Refinements, changes, and new methodologies used in the development of this risk

assessment update are summarized in Chapter 2 What's New and detailed in this Risk Assessment portion of the plan.

4.1 Hazard Identification: Natural Hazards

Requirement §201.6(c)(2)(i): [The risk assessment shall include a] description of the type…of all natural hazards that can affect the jurisdiction.

The County HMPC conducted a hazard identification study to determine the hazards that threaten the planning area. This section details the methodology and results of this effort.

4.1.1 Methodology and Results

Using existing natural hazards data and input gained through planning meetings, the HMPC agreed upon a list of natural hazards that could affect the County. Hazards data from the California Office of Emergency Services (Cal OES), FEMA, the National Oceanic and Atmospheric Administration (NOAA), and many other sources were examined to assess the significance of these hazards to the planning area. Significance of each identified hazard was measured in general terms and focused on key criteria such as frequency and resulting damage, which includes deaths and injuries, as well as property and economic damage. The natural hazards evaluated as part of this plan include those that have occurred historically and/or have the potential to cause significant human and/or monetary losses in the future.

The following hazards in Table 4-1, listed alphabetically were identified and investigated for this plan update. As a starting point, the updated 2013 California State Hazard Mitigation Plan was consulted to evaluate the applicability of new hazards of concern to the State to the planning area. Building upon this effort, hazards from the past plan were also identified, and comments explain how hazards were updated from the previous plan. Many hazards from the 2010 plan were profiled in this plan, some were dropped, and additional hazards were added. This is shown in Table 4-1.

Table 4-1 Hazard Identification and Comparison

2015 Hazards	2010 Hazards	Comment
Agricultural Hazards	–	New hazard
Avalanche	Avalanche*	Similar analysis was performed.
Dam Failure	Dam/Levee Failure	Dam failure and levee failure are profiled in this plan as separate hazards.
Drought and Water Shortage	Drought	This hazard was expanded to include the water shortage component of drought.
Earthquake	Earthquake	
Flood 100/500 year	Flood	The finalized DFIRM was used for this plan (the 2010 plan used the preliminary DFIRM). A discussion of population at risk was also added.

2015 Hazards	2010 Hazards	Comment
Flood: Localized Stormwater Flooding	Flood	Localized flooding was broken out separately from the 100-/500-year
Landslides and Debris Flows	Landslide/Erosion	Similar analysis was performed.
Levee Failure	Dam/Levee Failure	Dam failure and levee failure are profiled in this plan as separate hazards.
Severe Weather: Extreme Heat	Extreme Heat	Similar analysis was performed.
Severe Weather: Heavy Rains and Storms	–	New hazard. Includes other factors such as hail and lightning.
Severe Weather: Wind (includes tornadoes)	Windstorm	Tornadoes were added to the profile language on windstorm.
Severe Weather: Winter Storms and Extreme Cold	Severe Winter Storm	Similar analysis was performed.
Volcano	Volcano	Similar analysis was performed.
Wildfire	Wildfire	Enhanced analysis was performed using the latest datasets. Wildfires caused by severe weather was further analyzed.
–	Coastal Erosion*	As in the last plan, this hazard was not profiled due to the lack of coastal area.
–	Coastal Storm*	As in the last plan, this hazard was not profiled due to the lack of coastal area.
–	Expansive Soils	This hazard was eliminated by the HMPC due to lack of past occurrences in the County.
–	Hailstorm*	As in the last plan, this hazard was not profiled.
–	Hurricane*	As in the last plan, this hazard was not profiled.
–	Land Subsidence	This hazard was eliminated by the HMPC due to lack of past occurrences in the County.
	Tsunami*	As in the last plan, this hazard was not profiled as there is not potential of damaging occurrences within the County.

*indicates hazard identified but not profiled.

The worksheet below was completed by the HMPC to identify, profile, and rate the significance of identified hazards. Only the more significant (or priority) hazards have a more detailed hazard profile and are analyzed further in Section 4.3 Vulnerability Assessment. Table 4-26 in Section 4.2.16 Natural Hazards Summary gives more detail about these significant hazards.

Table 4-2 Calaveras County Hazard Identification Worksheet

Hazard	Geographic Extent	Probability of Future Occurrences	Magnitude/ Severity	Significance
Agricultural Hazards	Extensive	Highly Likely	Critical	Medium
Avalanche	Limited	Unlikely	Negligible	Low
Dam Failure	Limited	Occasional	Catastrophic	Medium
Drought and Water Shortage	Extensive	Likely	Critical	High
Earthquake	Significant	Occasional	Limited	Low
Flood 100/500 year	Significant	Occasional	Critical	Medium
Flood: Localized Stormwater Flooding	Extensive	Highly Likely	Limited	High
Landslides and Debris Flows	Limited	Occasional	Limited	Low
Levee Failure	Limited	Unlikely	Negligible	Low
Severe Weather: Extreme Heat	Extensive	Highly Likely	Limited	Low
Severe Weather: Heavy Rains and Storms	Extensive	Highly Likely	Critical	High
Severe Weather: Wind (includes tornadoes)	Extensive	Highly Likely	Limited	Medium
Severe Weather: Winter Storms and Extreme Cold	Extensive	Highly Likely	Critical	High
Volcano	Extensive	Unlikely	Critical	Low
Wildfire	Extensive	Highly Likely	Catastrophic	High

Geographic Extent
Limited: Less than 10% of planning area
Significant: 10-50% of planning area
Extensive: 50-100% of planning area

Probability 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—10-25 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

4.1.2 Disaster Declaration History

One method to identify hazards based upon past occurrence is to look at what events triggered federal and/or state disaster declarations within the planning area. Disaster declarations are granted when the severity and magnitude of the event's impact surpass the ability of the local government to respond and recover. Disaster assistance is supplemental and sequential. When the local government's capacity has been surpassed, a state disaster declaration may be issued, allowing for the provision of state assistance. Should the disaster be so severe that both the local and state government's capacity is exceeded, a federal disaster declaration may be issued allowing for the provision of federal disaster assistance.

Calaveras County has experienced 14 federal and 17 state declarations since 1950. 8 of the federal declarations were associated with flood and severe storm events, 4 were related to fire, 1 to drought, and 1 to the Hurricane Katrina evacuations. Of the state disasters, 11 were related to flood and severe storm, 3 were related to fire, 3 were related to drought. A summation of federal and state disaster declarations is shown in Table 4-3.

Table 4-3 Calaveras County Federal and State Disaster Declaration History

Hazard Type	Disaster Name	Disaster Number	State Declaration	Federal Declaration	# of Deaths	# of Injuries	Costs
Flood	Floods	CDO 50-01	11/21/50	–	9	–	$32.2 million
Flood	Floods	DR-47	12/22/55	12/23/55	74	–	$200.0 million
Flood	Storm/Flood Damage	DR-82	04/02/58	4/4/58	13	several	$24.0 million
Flood	1969 Storms	DR-253	02/08/69	1/26/69	47	161	$300.0 million
Drought	Drought	EM-3023	02/09/76	1/20/1977	–	–	$2.7 billion
Flood	1980 April Storms	80-01 – 80-25	4/1/1980	–	–	–	–
Flood	Heavy Rains and Flooding	DC 82-03	4/1/1982	–	–	–	–
Severe Storm	Storms	DR-758	02/20/86	2/18/86	13	67	$407.5 million
Fire	Wildfire	N/A	07/21/88	–	–	–	–
Fire	Fountain	DR-958	08/02/92	8/29/92	–	8	$54.0 million
Severe Storm/ Flood	Late Winter Storms	DR-1046	–	1/10/95	17	–	$1.1 billion
Flood	1997 January Flood	DR-1155	1/2/97-1/31/97	1/4/1997	8	–	$194 million
Flood	January 1997 Floods	–	01/03/97	–	8	–	$1.8 billion
Flood	El Nino	DR-1203	–	02/02/98	17	–	$550.0 million
Fire	Wildfire	–	09/10/01	–	–	–	$6.7 million
Fire	Calaveras Complex	FM-2540	–	8/8/2004	–	–	$4.6 million

Hazard Type	Disaster Name	Disaster Number	State Declaration	Federal Declaration	# of Deaths	# of Injuries	Costs
Fire	Pattison Fire	FM-2553	–	9/4/2004	–	–	$3.6 million
Hurricane	Hurricane Katrina Evacuations	EM-3248	–	9/13/2005	–	–	–
Severe Storm/ Flood	Severe Storms, Flooding, Landslides, Mudslides	DR-1646	–	6/5/06	–	–	–
Drought	Central Valley Drought	-	6/12/2008	–	–	–	–
Flood, debris and mud flows	2010 Severe Winter Storm	DR-1884	1/27/2010	3/8/2010	2	–	$37,065,584
Storms	November Storms	GP 2010-14	11/30/2010; 12/09/2010	–	–	–	$160,280
Drought	California Drought	GP 2014-13	1/17/2014	–	–	–	–
Wildfire	Butte Fire	DR-4240		9/22/2015	–	–	–

Source: Cal OES, FEMA

4.2 Hazard Profiles

Requirement §201.6(c)(2)(i): [The risk assessment shall include a] description of the…location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

The hazards identified in Section 4.1 Hazard Identification Natural Hazards, are profiled individually in this section. In general, information provided by planning team members is integrated into this section with information from other data sources. These profiles set the stage for Section 4.3 Vulnerability Assessment, where the vulnerability is quantified for each of the priority hazards.

Each hazard is profiled in the following format:

- **Hazard/Problem Description**—This section gives a description of the hazard and associated issues followed by details on the hazard specific to the County. Where known, this includes information on the hazard extent, area, seasonal patterns, speed of onset/duration, and magnitude and/or any secondary effects.
- **Past Occurrences**—This section contains information on historical incidents, including impacts where known. The extent or location of the hazard within or near the County is also included here. Historical incident worksheets were used to capture information from participating jurisdictions on past occurrences.
- **Frequency/Likelihood of Future Occurrence**—The frequency of past events is used in this section to gauge the likelihood of future occurrences. Where possible, frequency was calculated based on existing data. It was determined by dividing the number of events observed by the number of years on record and multiplying by 100. This gives the percent chance of the event happening in any given year (e.g., three droughts over a 30-year period equates to a 10 percent chance of a experiencing a drought in any given year). The likelihood of future occurrences is categorized into one of the following classifications:
  - ✓ **Highly Likely**—Near 100 percent chance of occurrence in next year or happens every year
  - ✓ **Likely**—Between 10 and 100 percent chance of occurrence in next year or has a recurrence interval of 10 years or less
  - ✓ **Occasional**—Between 1 and 10 percent chance of occurrence in the next year or has a recurrence interval of 11 to 100 years
  - ✓ **Unlikely**—Less than 1 percent chance of occurrence in next 100 years or has a recurrence interval of greater than every 100 years.
- **Climate Change**—This section contains the effects of climate change (if applicable). The possible ramifications of climate change on the hazard are discussed.

Section 4.2.16 Natural Hazards Summary provides an initial assessment of the profiles and assigns a level of significance or priority to each hazard. Those hazards determined to be of medium or high significance were characterized as priority hazards that required further evaluation in Section 4.3 Vulnerability Assessment. Those hazards that occur infrequently or have little or no impact on the planning area were determined to be of low significance and not considered a priority hazard. Significance was determined based on the hazard profile, focusing on key criteria such as frequency and resulting damage, including deaths/injuries and property, crop, and economic damage. The ability of a community to reduce losses

through implementation of existing and new mitigation measures was also considered as to the significance of a hazard. This assessment was used by the HMPC to prioritize those hazards of greatest significance to the planning area, enabling the County to focus resources where they are most needed.

The following sections provide profiles of the natural hazards that the HMPC identified in Section 4.1 Hazard Identification. Given that most disasters affect the planning area are directly or indirectly related to severe weather events, severe weather hazards begins this section, and the individual hazard profiles following alphabetically.

4.2.1. Severe Weather: General

Severe weather is generally any destructive weather event, but usually occurs in Calaveras County as localized storms that bring heavy rain, hail, lightning, and sometimes strong winds. The National Oceanic and Atmospheric Administration's National Climatic Data Center (NCDC) has been tracking severe weather since 1950. Their Storm Events Database contains data on the following: all weather events from 1993 to current (except from 6/1993-7/1993); and additional data from the Storm Prediction Center, which includes tornadoes (1950-1992), thunderstorm winds (1955-1992), and hail (1955-1992). This database contains 142 severe weather events that occurred in Calaveras County between January 1, 1950, and October 31, 2014. Table 4-4 summarizes these events.

Table 4-4 NCDC Severe Weather Reports for Calaveras County, 1950 – 10/31/2014

Event Type	Number of Events	Deaths	Injuries	Property Damage*	Crop Damage*
Avalanche	1	0	2	$0	$0
Blizzard	1	0	0	$50,000	$0
Cold/Wind Chill	1	0	0	$0	$0
Dense Fog	7	1	9	$150,000	$0
Dust Storm	1	0	0	$100,000	$0
Flood	15	2	4	$389,330,000	$0
Heat	3	9	0	$0	$0
Heavy Rain	1	0	0	$0	$0
Heavy Snow	22	3	2	$200,000	$0
High Wind	54	5	12	$406,000	$0
Strong Wind	8	0	0	$5,000	$0
Tornado	1	0	0	$0	$0
Wildfire	1	0	0	$0	$0
Winter Storm	24	2	1	$125,000	$0
Winter Weather	2	14	0	$0	$0
Total	**142**	**36**	**30**	**$390,366,000**	**$0**

Source: NCDC
*Note: Losses reflect totals for all impacted areas, which may include multiple counties

The HMPC supplemented NCDC data with data from SHELDUS (Spatial Hazard Events and Losses Database for the United States). SHELDUS is a county-level data set for the United States that tracks 18 types of natural hazard events along with associated property and crop losses, injuries, and fatalities for the period 1960-2008. Produced by the Hazards Research Lab at the University of South Carolina, this database combines information from several sources (including the NCDC). The database includes every loss causing and/or deadly event between 1960 through 1979 and from 1995 onward. Between 1980 and 1995, SHELDUS reflects only events that caused at least one fatality or more than $50,000 in property or crop damages. For events that covered multiple counties, the dollar losses, deaths, and injuries were equally divided among the affected counties (e.g., if four counties were affected, then a quarter of the dollar losses, injuries, and deaths were attributed to each county). From 1995 to 2012 all events that were reported by the NCDC with a specific dollar amount are included in SHELDUS.

SHELDUS contains information of 104 severe weather events that occurred in Calaveras County between 1960 and 2012. These events are shown and summarized in Table 4-5.

Table 4-5 SHELDUS Severe Weather Report for Calaveras County 1960-2012

Type	# of Events	Injuries	Deaths	Property Damage	Crop Damage
Flooding	7	0	0.17	$473,337.66	$709,090.91
Flooding - Severe Storm/Thunder Storm	1	0	0	$86,206.90	$0
Flooding - Severe Storm/Thunder Storm - Wind	1	0	0	$0	$11,241,379.31
Flooding - Wind - Winter Weather	1	0	0	$1,315.79	$0
Flooding - Winter Weather	2	0	0	$20,718.82	$0
Fog	3	0.5	0.5	$160,000	$0
Hail - Severe Storm/Thunder Storm - Wind - Winter Weather	1	0.02	0.03	$86.21	$0
Heat	3	1.23	0.2	$0	$14,705.88
Landslide – Winter Weather	1	0	0	$2,778.78	$0
Lightning	3	0	0	$1,250.01	$0
Lightning - Severe Storm/Thunder Storm	2	0	0	$261.36	$113.64
Lightning - Wind - Winter Weather	1	0	0	$14.71	$14,705.88
Severe Storm/Thunder Storm	12	0.23	0.98	$892,323.87	$18,814.66
Severe Storm/Thunder Storm – Wind	9	0.5	0.52	$129,466.67	$1,257.18
Severe Storm/Thunder Storm - Wind - Winter Weather	4	0.07	0.6	$1,690,435.14	$175,287.36
Severe Storm/Thunder Storm - Winter Weather	1	0	0	$1,470.59	$0
Wildfire	2	0.11	0	$290,000	$0
Wind	22	0.5	0.27	$1,167,970.91	$7,201.09
Wind - Winter Weather	2	0.43	0.07	$2,988.72	$0
Winter Weather	26	2.76	0.29	$233,547.91	$8,905,032.50

Type	# of Events	Injuries	Deaths	Property Damage	Crop Damage
Total	**104**	**6.35**	**3.63**	**$5,154,174.05**	**$21,087,588.41**

Source: SHELDUS
*Events may have occurred over multiple counties, so damage may represent only a fraction of the total event damage and may be not specific to Calaveras County

The NCDC and SHELDUS tables above summarize severe weather events that occurred in Calaveras County. Only a few of the events actually resulted in state and federal disaster declarations. It is further interesting to note that different data sources capture different events during the same time period, and often display different information specific to the same events. While the HMPC recognizes these inconsistencies, they see the value this data provides in depicting the County's big picture hazard environment.

As previously mentioned, most all of Calaveras County's state and federal disaster declarations have been a result of severe weather. For this plan, severe weather is discussed in the following subsections:

- Extreme Heat
- Heavy Rains and Storms
- Wind (including tornado)
- Winter Storms and Extreme Cold

4.2.2. Severe Weather: Extreme Heat

Hazard/Problem Description

According to information provided by FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks. Heat kills by taxing the human body beyond its abilities. In a normal year, about 175 Americans succumb to the demands of summer heat. According to the National Weather Service (NWS), among natural hazards, only the cold of winter—not lightning, hurricanes, tornados, floods, or earthquakes—takes a greater toll. In the 40-year period from 1936 through 1975, nearly 20,000 people were killed in the United States by the effects of heat and solar radiation. In the heat wave of 1980, more than 1,250 people died.

Heat disorders generally have to do with a reduction or collapse of the body's ability to shed heat by circulatory changes and sweating or a chemical (salt) imbalance caused by too much sweating. When heat gain exceeds the level the body can remove, or when the body cannot compensate for fluids and salt lost through perspiration, the temperature of the body's inner core begins to rise and heat-related illness may develop. Elderly persons, small children, chronic invalids, those on certain medications or drugs, and persons with weight and alcohol problems are particularly susceptible to heat reactions, especially during heat waves in areas where moderate climate usually prevails.

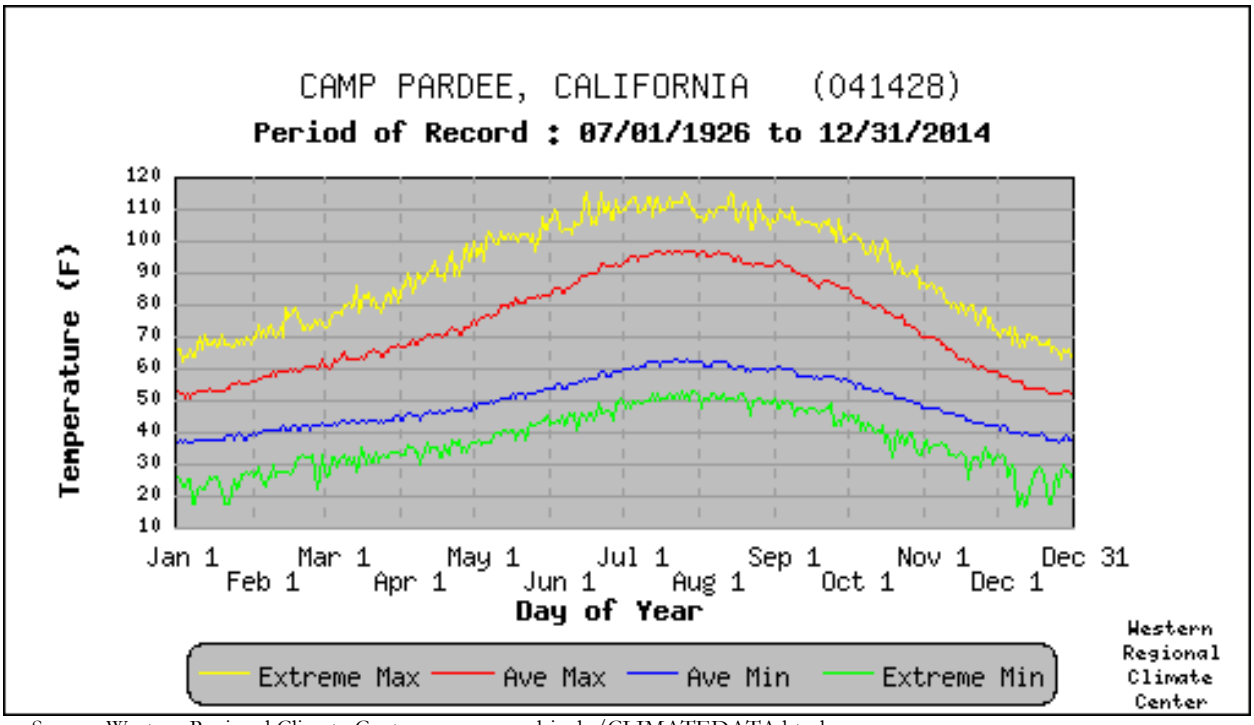
Heat emergencies are often slower to develop, taking several days of continuous, oppressive heat before a significant or quantifiable impact is seen. Heat waves do not strike victims immediately, but rather their cumulative effects slowly take the lives of vulnerable populations. Heat waves do not cause damage or elicit the immediate response of floods, fires, earthquakes, or other more "typical" disaster scenarios. While

heat waves are obviously less dramatic, they are potentially more deadly. According to the 2013 California State Hazard Mitigation Plan, the worst single heat wave event in California occurred in Southern California in 1955, when an eight-day heat wave resulted in 946 deaths.

The Western Regional Climate Center (WRCC) maintains data on weather normal and extremes in the western United States. Figure 4-1 and Figure 4-2 show average and extreme temperatures from the Camp Pardee weather station in the northwest part of the county and the Calaveras Big Trees weather station in the southeast part of the County. The highest temperature on record at Camp Pardee is 115°F recorded on July 26, 1931. On average, there were 85.5 days annually with a high temperature at or above 90°F; more than half of these occurred in July and August. At Camp Pardee, temperatures of 102°F or above are on record for every month May through October.

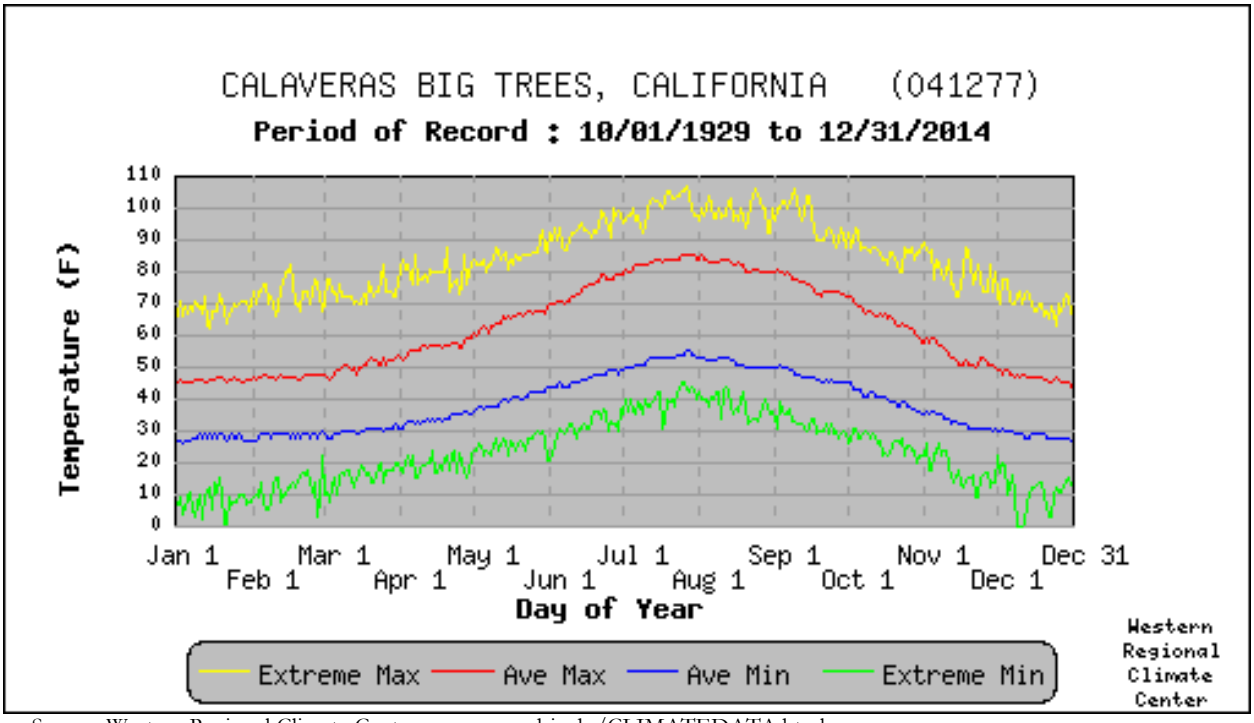
At the Calaveras Big Trees station, the highest recorded temperature on record was 107°F on July 27, 1933. On average, there are 11.7 days annually that are above 90°F; most occurring in July and August.

Figure 4-1 Daily Temperature Averages and Extremes, Camp Pardee, 1926-2014



Source: Western Regional Climate Center, www.wrcc.dri.edu/CLIMATEDATA.html

Figure 4-2 Daily Temperature Averages and Extremes, Calaveras Big Trees, 1929-2014



Source: Western Regional Climate Center, www.wrcc.dri.edu/CLIMATEDATA.html

In July 2006, the NWS Forecast Station in Sacramento reported 11 consecutive days of temperatures over 100°F. In Stockton, California, approximately 30 miles from Calaveras County, temperatures reached 115°F on July 23, 2006. The U.S. Department of Agriculture (USDA) declared 16 California counties, including Calaveras, as primary natural disaster areas due to the record-setting heat wave that occurred July 1-31, 2006. The declaration made farmers in the county eligible for low-interest emergency loans from USDA's Farm Service Agency.

Figure 4-3 and Figure 4-4 show the Heat Index (HI) as a function of heat and relative humidity. The Heat Index describes how hot the heat-humidity combination makes it feel. As relative humidity increases, the air seems warmer than it actually is because the body is less able to cool itself via evaporation of perspiration. As the HI rises, so do health risks.

- When the HI is 90°F, heat exhaustion is possible with prolonged exposure and/or physical activity.
- When it is 90°-105°F, heat exhaustion is probable with the possibility of sunstroke or heat cramps with prolonged exposure and/or physical activity.
- When it is 105°-129°F, sunstroke, heat cramps or heat exhaustion is likely, and heatstroke is possible with prolonged exposure and/or physical activity.
- When it is 130°F and higher, heatstroke and sunstroke are extremely likely with continued exposure. Physical activity and prolonged exposure to the heat increase the risks.

Figure 4-3 Heat Index

Temperature (°F)

Relative Humidity (%)	80	82	84	86	88	90	92	94	96	98	100	102	104	106	118	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	126	130					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

Likelihood of Heat Disorders with Prolonged Exposure or Streuous Activity

Caution | Extreme Caution | Danger | Extreme Danger

Source: National Weather Service

Note: Since HI values were devised for shady, light wind conditions, exposure to full sunshine can increase HI values by up to 15°F. Also, strong winds, particularly with very hot, dry air, can be extremely hazardous.

Figure 4-4 Possible Heat Disorders by Heat Index Level

Heat Index	Category	Possible heat disorders for people in high risk groups
130°F or higher	Extreme Danger	Heatstroke risk extremely high with continued exposure.
105° - 129°F	Danger	Sunstroke, Heat Cramps and Heat Exhaustion likely, Heatstroke possible with prolonged exposure and/or physical activity.
90° - 105°F	*Extreme Caution*	*Sunstroke, Heat Cramps and Heat Exhaustion possible with prolonged exposure and/or physical activity.*
80° - 90 °F	Caution	Fatigue possible with prolonged exposure and/or physical activity.

Source: National Weather Service

The NWS has in place a system to initiate alert procedures (advisories or warnings) when the Heat Index is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued. A common guideline for the issuance of excessive heat alerts is when the maximum daytime high is expected to equal or exceed 105°F and a nighttime minimum high of 80°F or above is expected for two or more consecutive days. The NWS office in Sacramento can issue the following heat-related advisory as conditions warrant.

- **Excessive Heat Outlook**: are issued when the potential exists for an excessive heat event in the next 3-7 days. An Outlook provides information to Heat Index forecast map for the contiguous United States

those who need considerable lead time to prepare for the event, such as public utilities, emergency management and public health officials.

- **Excessive Heat Watch**: is issued when conditions are favorable for an excessive heat event in the next 12 to 48 hours. A Watch is used when the risk of a heat wave has increased, but its occurrence and timing is still uncertain. A Watch provides enough lead time so those who need to prepare can do so, such as cities that have excessive heat event mitigation plans.
- **Excessive Heat Warning/Advisory**: are issued when an excessive heat event is expected in the next 36 hours. These products are issued when an excessive heat event is occurring, is imminent, or has a very high probability of occurring. The warning is used for conditions posing a threat to life or property. An advisory is for less serious conditions that cause significant discomfort or inconvenience and, if caution is not taken, could lead to a threat to life and/or property.

Past Occurrences

The NCDC data shows 2 extreme heat incidents for Calaveras County since 1993. These are shown in Table 4-6.

Table 4-6 NCDC Extreme Heat Events in Calaveras County 1993 to 10/31/2014

	Date	Deaths	Injuries	Property Damage	Crop Damage
Heat	8/15/1996	4	0	$0	$0
Heat	8/2/1997	5	0	$0	$0

Source: NCDC

SHELDUS shows three events that affected the County since 1960. These are shown in Table 4-7.

Table 4-7 SHELDUS Extreme Heat Events in Calaveras County 1960 to 2012

Hazard Begin Date	Hazard End Date	Hazard Type	Injuries	Fatalities	Property Damage	Crop Damage	Remarks
6/13/1961	6/17/1961	Heat	0	0	$0.00	$14,705.88	Heat
8/13/1992	8/20/1992	Heat	1.03	0	$0.00	$0.00	Heat Wave
5/14/2008	5/14/2008	Heat	0.2	0.2	$0.00	$0.00	Heat
Totals			1.23	0.2	$0.00	$14,705.88	

Source: SHELDUS

Likelihood of Future Occurrences

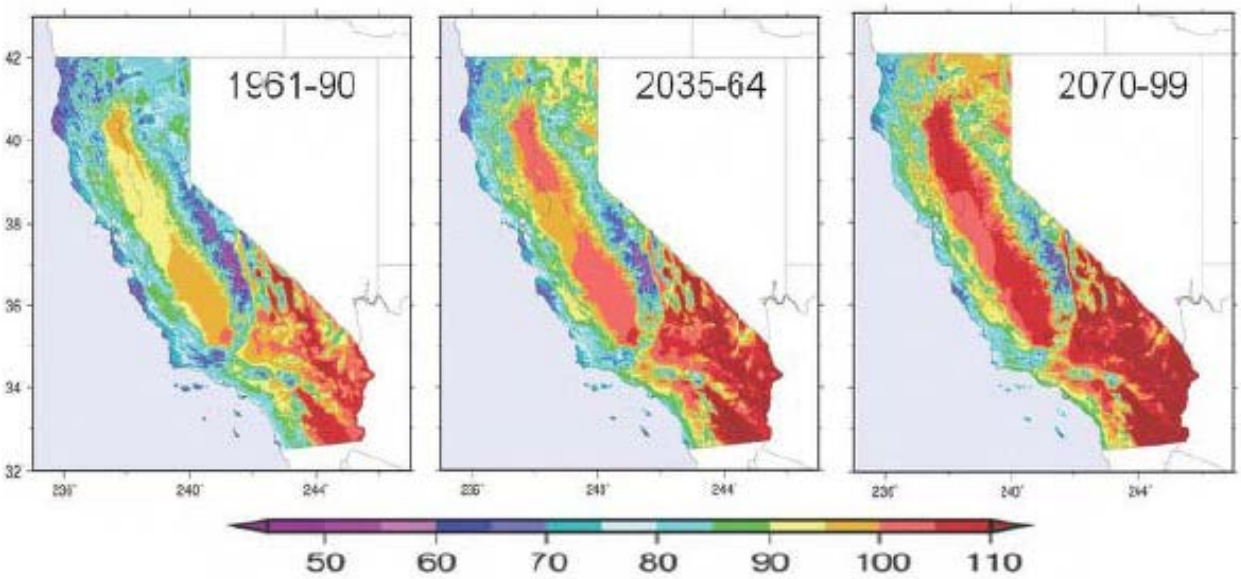
Highly Likely—Although not highly documented in the NCDC and SHELDUS databases, extreme heat events occur annually in Calaveras County. Extreme heat is less likely in eastern portions of the county at higher elevations, than in the western portion. Temperatures at or above 90°F are common most summer days in the western part of the County.

Climate Change and Extreme Heat

The California Climate Adaptation Strategy (CAS), citing a California Energy Commission study, states that "over the past 15 years, heat waves have claimed more lives in California than all other declared disaster

events combined." This study shows that California is getting warmer, leading to an increased frequency, magnitude, and duration of heat waves. These factors may lead to increased mortality from excessive heat, as shown in Figure 4-5.

Figure 4-5 California Historical and Projected Temperature Increases - 1961 to 2099



Source: Dan Cayan; California Climate Adaptation Strategy

As temperatures increase, California and Calaveras County will face increased risk of death from dehydration, heat stroke, heat exhaustion, heart attack, stroke and respiratory distress caused by extreme heat. According to the CAS report and the 2010 State of California Hazard Mitigation Plan, by 2100, hotter temperatures are expected throughout the state, with projected increases of 3-5.5°F (under a lower emissions scenario) to 8-10.5°F (under a higher emissions scenario). These changes could lead to an increase in deaths related to extreme heat in Calaveras County.

4.2.3. Severe Weather: Heavy Rain and Storms

Hazard/Problem Description

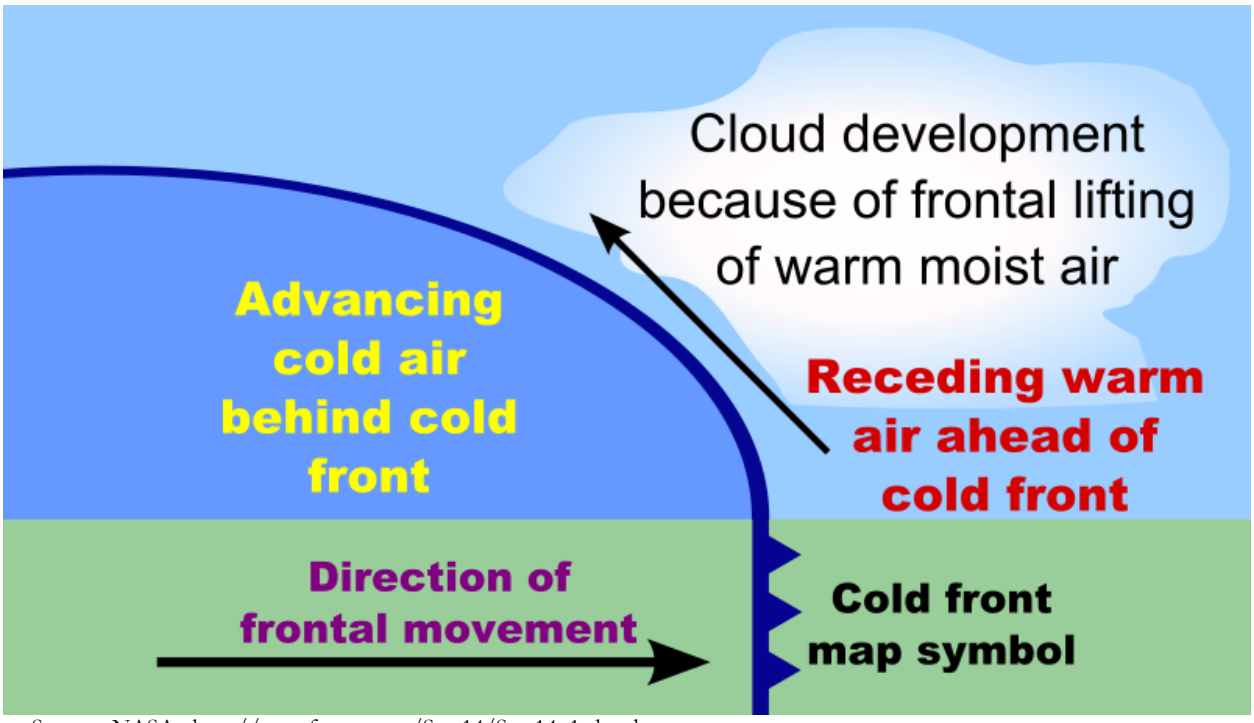
According to the NWS and WRCC storms in Calaveras County are generally characterized by heavy rain often accompanied by strong winds and sometimes lightning and hail. Approximately 10 percent of the thunderstorms that occur each year in the United States are classified as severe. A thunderstorm is classified as severe when it contains one or more of the following phenomena: hail that is three-quarters of an inch or greater, winds in excess of 50 knots (57.5 mph), or a tornado. Heavy precipitation in Calaveras County falls mainly in the fall, winter, and spring months.

Heavy Rain and Thunderstorms

Thunderstorms result from the rapid upward movement of warm, moist air (see Figure 4-6). They can occur inside warm, moist air masses and at fronts. As the warm, moist air moves upward, its cools, condenses, and forms cumulonimbus clouds that can reach heights of greater than 35,000 ft. As the rising

air reaches its dew point, water droplets and ice form and begin falling the long distance through the clouds towards earth's surface. As the droplets fall, they collide with other droplets and become larger. The falling droplets create a downdraft of air that spreads out at Earth's surface and causes strong winds associated with thunderstorms.

Figure 4-6 Formation of a Thunderstorm



Source: NASA. http://rst.gsfc.nasa.gov/Sect14/Sect14_1c.html

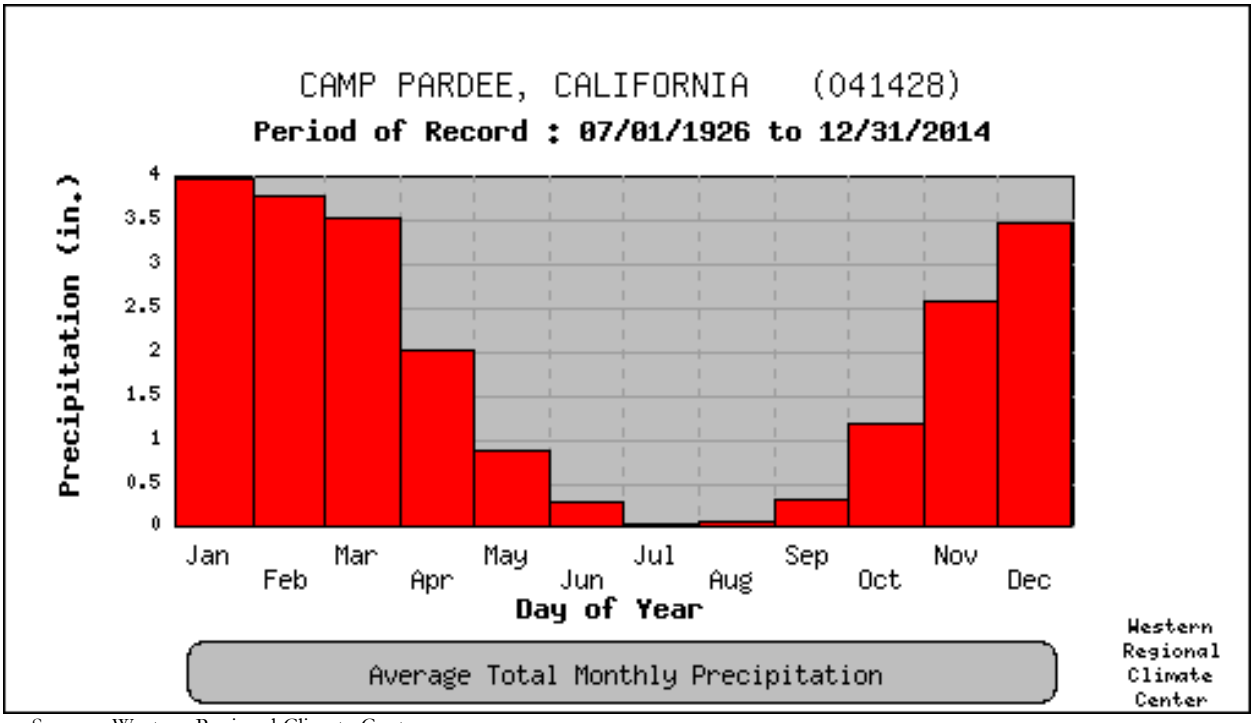
According to the HMPC, short-term, heavy storms can cause both widespread flooding as well as extensive localized drainage issues. With the increased growth of the area, the lack of adequate drainage systems has become an increasingly important issue. In addition to the flooding that often occurs during these storms, strong winds, when combined with saturated ground conditions, can down very mature trees.

Information from the Camp Pardee and the Calaveras Big Trees weather stations in Calaveras County are summarized below. Figure 4-7 and Figure 4-8 show average and extreme precipitation from the Camp Pardee weather station in the northwest part of the County, while Figure 4-9 and Figure 4-10 show average and extreme precipitation from the Calaveras Big Trees weather station in the southeast part of the county.

Camp Pardee Weather Station, Period of Record 1926 to 2011

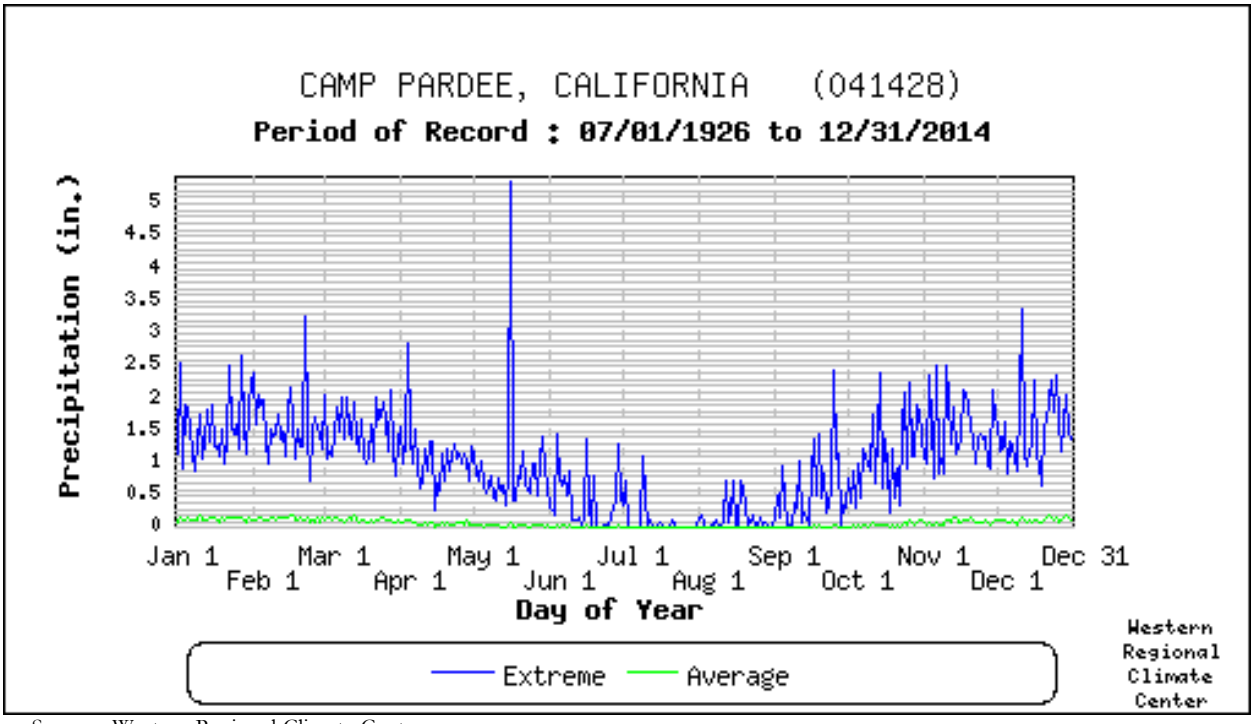
Average annual precipitation at the Camp Pardee Station is 21.5 inches per year. The highest recorded annual precipitation is 44.9 inches in 1983. The lowest recorded annual precipitation was 7.1 inches in 1976.

Figure 4-7 Camp Pardee Monthly Average Total Precipitation



Source: Western Regional Climate Center

Figure 4-8 Camp Pardee Daily Precipitation Average and Extremes

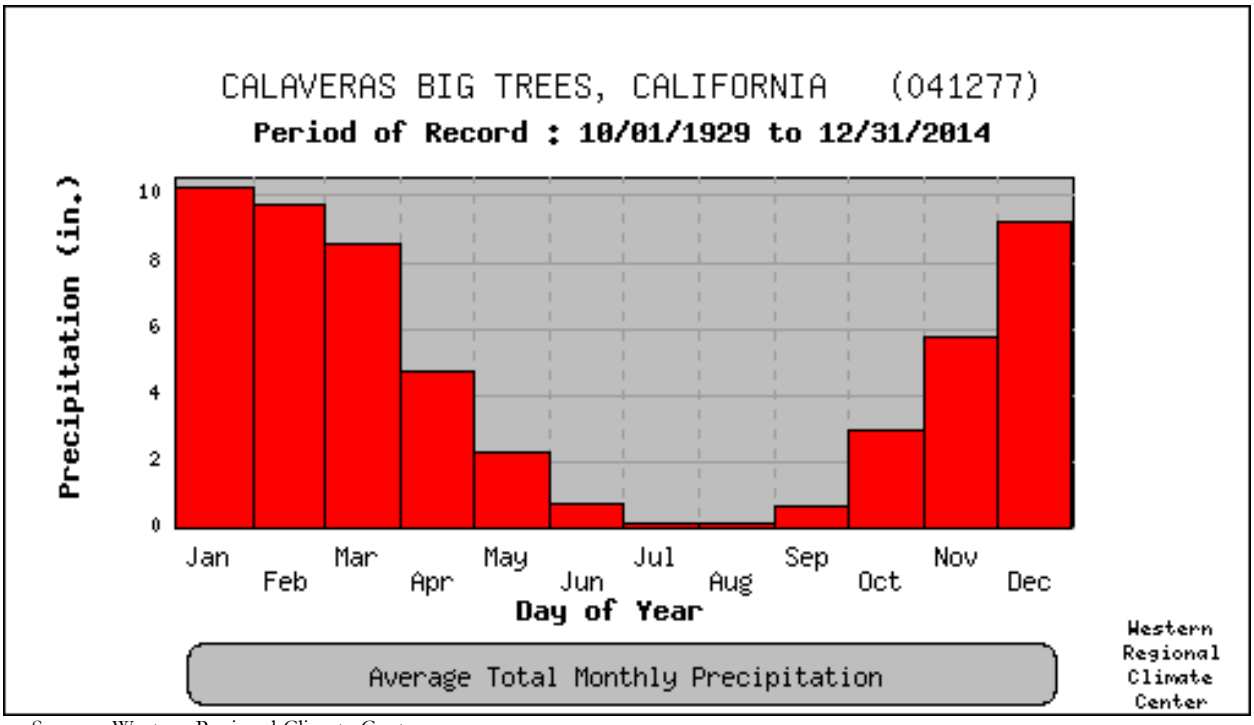


Source: Western Regional Climate Center

Calaveras Big Trees Weather Station, Period of Record 1929 to 2011

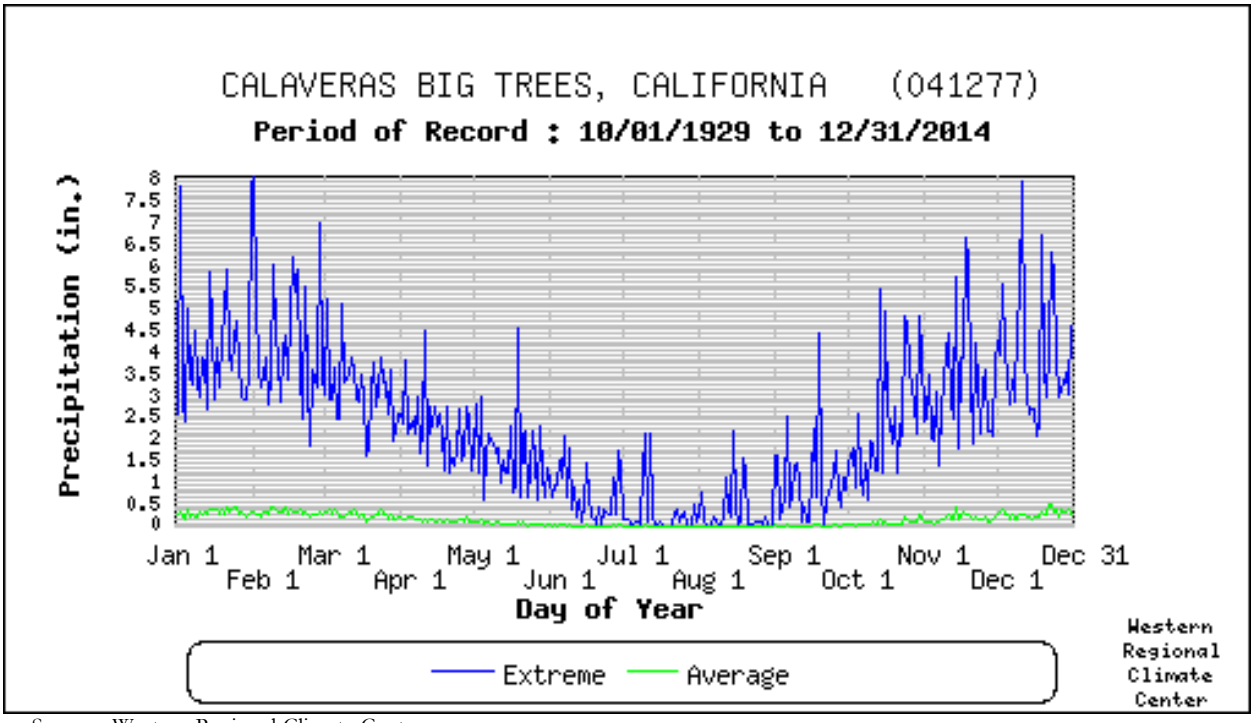
Average annual precipitation at the Calaveras Big Trees Station is 54.3 inches per year. The highest recorded annual precipitation is 109.1 inches in 1983. The lowest recorded annual precipitation was 8.1 inches in 1976.

Figure 4-9 Calaveras Big Trees Monthly Average Total Precipitation



Source: Western Regional Climate Center

Figure 4-10 Calaveras Big Trees Daily Precipitation Average and Extremes



Source: Western Regional Climate Center

Hail

Hail is formed when water droplets freeze and thaw as they are thrown high into the upper atmosphere by the violent internal forces of thunderstorms. Hail is sometimes associated with severe storms within Calaveras County. Hailstones are usually less than two inches in diameter and can fall at speeds of 120 miles per hour (mph). Severe hailstorms can be quite destructive, causing damage to roofs, buildings, automobiles, vegetation, and crops.

The NWS classifies hail by diameter size, and corresponding everyday objects to help relay scope and severity to the population. Table 4-8 indicates the hailstone measurements utilized by the NWS.

Table 4-8 Hailstone Measurements

Average Diameter	Corresponding Household Object
.25 inch	Pea
.5 inch	Marble/Mothball
.75 inch	Dime/Penny
.875 inch	Nickel
1.0 inch	Quarter
1.5 inch	Ping-pong ball
1.75 inch	Golf-Ball
2.0 inch	Hen Egg

Average Diameter	Corresponding Household Object
2.5 inch	Tennis Ball
2.75 inch	Baseball
3.00 inch	Teacup
4.00 inch	Grapefruit
4.5 inch	Softball

Source: National Weather Service

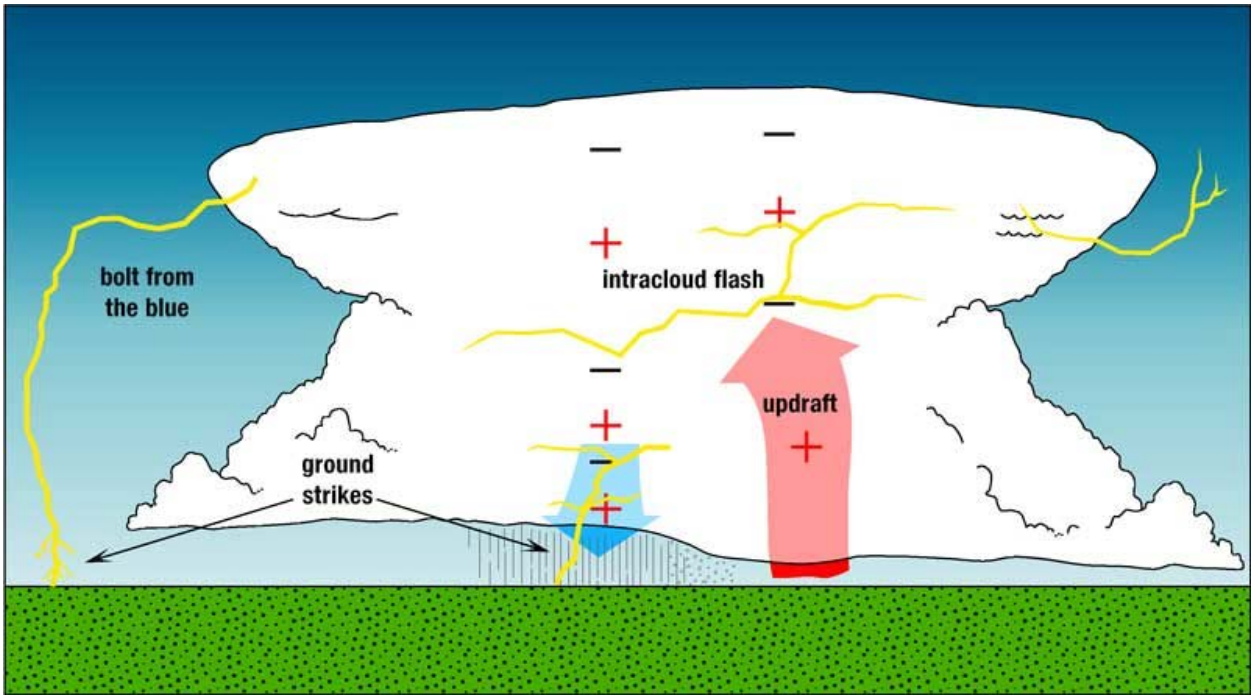
Lightning

Lightning is defined by the NWS as any and all of the various forms of visible electrical discharge caused by thunderstorms. Thunderstorms and lightning are usually (but not always) accompanied by rain. Cloud-to-ground lightning can kill or injure people by direct or indirect means. Objects can be struck directly, which may result in an explosion, burn, or total destruction. Or, damage may be indirect, when the current passes through or near an object, which generally results in less damage.

Intra-cloud lightning is the most common type of discharge. This occurs between oppositely charged centers within the same cloud. Usually it takes place inside the cloud and looks from the outside of the cloud like a diffuse brightening that flickers. However, the flash may exit the boundary of the cloud, and a bright channel, similar to a cloud-to-ground flash, can be visible for many miles.

Cloud-to-ground lightning is the most damaging and dangerous type of lightning, though it is also less common. Most flashes originate near the lower-negative charge center and deliver negative charge to earth. However, a large minority of flashes carry positive charge to earth. These positive flashes often occur during the dissipating stage of a thunderstorm's life. Positive flashes are also more common as a percentage of total ground strikes during the winter months. This type of lightning is particularly dangerous for several reasons. It frequently strikes away from the rain core, either ahead or behind the thunderstorm. It can strike as far as 5 or 10 miles from the storm in areas that most people do not consider to be a threat (see Figure 4-11). Positive lightning also has a longer duration, so fires are more easily ignited. And, when positive lightning strikes, it usually carries a high peak electrical current, potentially resulting in greater damage.

Figure 4-11 Cloud to Ground Lightning



Source: National Weather Service

Winds

Winds, tornadoes, and funnel clouds can also occur during these types of storms. These are discussed in Section 4.2.4.

Past Occurrences

Heavy rains and severe storms occur in the planning area primarily during the late fall, winter, and spring (i.e., November through April). Damaging winds often accompany winter storm systems moving through the area.

According to the HMPC, short-term, heavy storms can cause both widespread flooding as well as extensive localized drainage issues. With the increased growth of the area, the lack of adequate drainage systems has become an increasingly important issue. In addition to the flooding that often occurs during these storms, strong winds, when combined with saturated ground conditions, can down very mature trees and cause other various damage.

Although heavy rains are a frequent occurrence, thunderstorms, lightning, and hail in Calaveras County are fewer in number and usually occur in the late fall or in the spring. Specific events were detailed by the NCDC database (see Table 4-9) and the SHELDUS database (see Table 4-10).

Table 4-9 NCDC Incidences of Hail, Heavy Rain, and Lightning in Calaveras County from 1993 – 10/31/2014

Hail	Heavy Rain	Lightning
0	1	1

Source: NCDC

Table 4-10 SHELDUS Incidences of Hail, Heavy Rain, and Lightning in Calaveras County from 1960 – 2012

Hail	Heavy Rain	Lightning
1	11	6

Source: SHELDUS

Likelihood of Future Occurrences

Highly Likely – Although not well documented in the NCDC and SHELDUS databases, severe weather, including heavy rain, thunderstorms, hail, lightning, and wind is a well-documented occurrence that will continue to occur in Calaveras County.

Climate Change and Thunderstorm

According to the CAS, while average annual rainfall may increase or decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century. It is unlikely that hail will become more common in the County. The amount of lightning is not projected to change.

4.2.4. Severe Weather: Wind (including tornadoes)

Hazard/Problem Description

High winds, as defined by the NWS glossary, are sustained wind speeds of 40 mph or greater lasting for 1 hour or longer, or winds of 58 mph or greater for any duration. These winds may occur as part of a seasonal climate pattern or in relation to other severe weather events such as thunderstorms. Straight-line winds may also exacerbate existing weather conditions by increasing the effect on temperature and decreasing visibility due to the movement of particulate matters through the air, as in dust and snow storms. The winds may also exacerbate fire conditions by drying out the ground cover, propelling fuel around the region, and increasing the ferocity of exiting fires. These winds may damage crops, push automobiles off roads, damage roofs and structures, overturn mobile homes, tear roofs off of houses, topple trees, snap power lines, shatter windows, and sandblast paint from cars, and cause secondary damage due to flying debris. Other associated hazards include utility outages, arcing power lines, debris blocking streets, dust storms, and an occasional structure fire.

In Calaveras County, high winds, sometimes accompanying severe thunderstorms but often not, can cause significant property and crop damage, threaten public safety, and have adverse economic impacts from business closures and power loss. Windstorms in Calaveras County are typically straight-line winds. Straight-line winds are generally any thunderstorm wind that is not associated with rotation (i.e., is not a

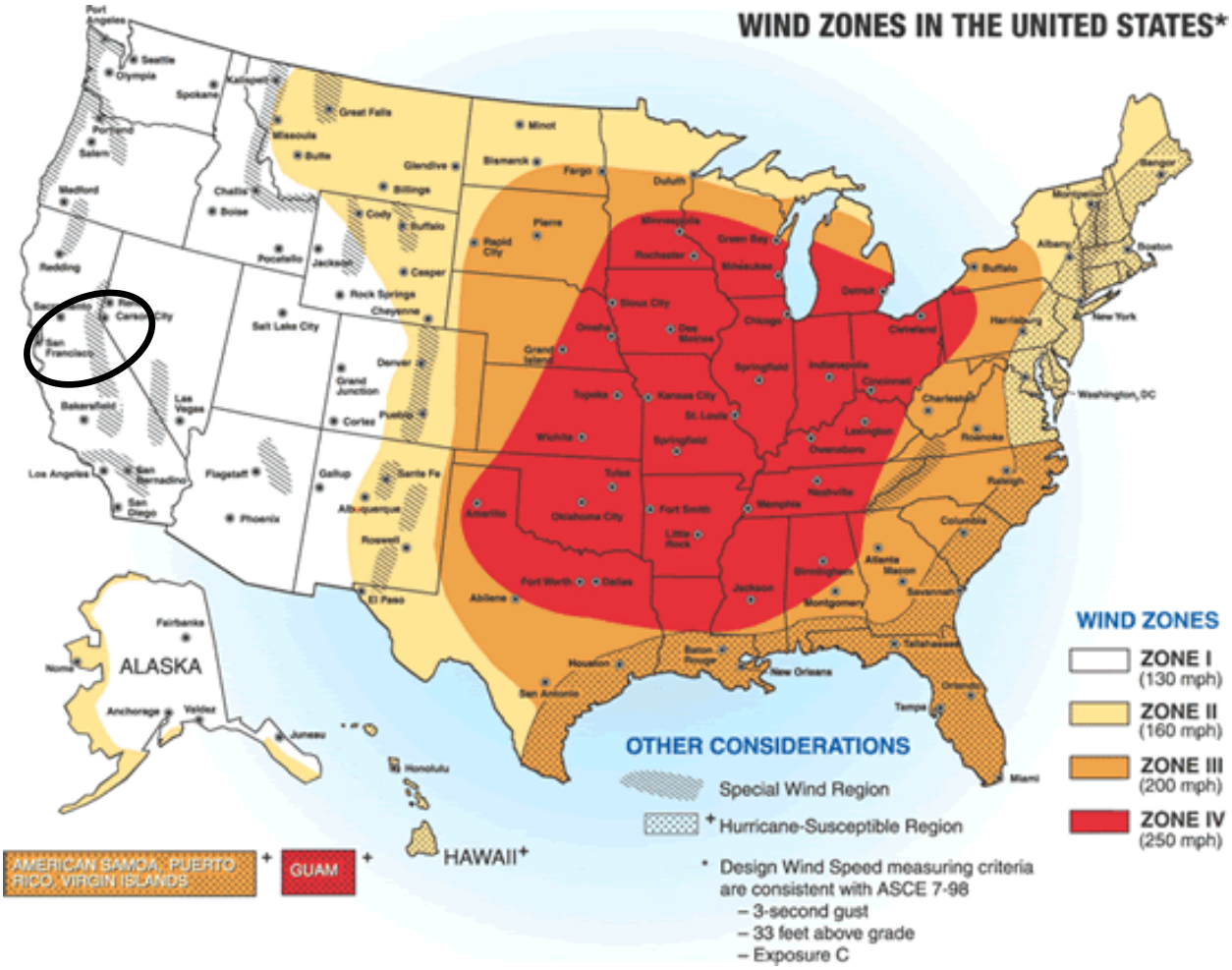
tornado). It is these winds, which can exceed 100 mph, which represent the most common type of severe weather and are responsible for most wind damage related to thunderstorms. .

While not as common in Calaveras County, other types of winds include funnel clouds, tornadoes, and dust devils. A funnel cloud is made up of condensed water droplets associated with a rotating column of air that extends from the base of a cloud but does not reach the ground. Like straight-line winds, they are usually associated with thunderstorms. If a funnel cloud touches the ground it becomes a tornado. Tornadoes, according to the NWS can reach speeds of up to 300 mph and are the most powerful storms that exist. Unlike funnel clouds and tornadoes, dust devils are not associated with thunderstorms. They form under clear skies in which the sun has strongly heated the ground and are usually harmless, but at times they can be large enough to threaten people and property.

Severe windstorms are usually forecast 8-24 hours in advance and sometimes longer. The typical duration of windstorms is approximately 8-36 hours and peak winds are usually sustained for less than 8-12 hours.

Figure 4-12 depicts wind zones for the United States. The map denotes that portions of Calaveras County fall into the Special Wind Region.

Figure 4-12 Wind Zones in the United States



Source: Federal Emergency Management Agency

Past Occurrences

According to the NCDC, most high wind events occur between November and March. Although summer winds are a frequent occurrence, with afternoon winds of 10 to 20 mph being common, it is the winds experienced during the winter storms that result in the most wind-related damage. Severe wind events create the most problem when trees fall on power lines, knocking out power and possibly making it difficult to reach critical facilities. NCDC storm events from 1955 to 10/31/2014 are shown in Table 4-11.

Table 4-11 NCDC Wind Events for Calaveras County 1955 – 10/31/2014

Event Type	Date	Injuries	Deaths	Property Damage	Crop Damage
High Wind	1/1/1996	0	0	$0	$0
High Wind	1/2/1996	0	0	$0	$0
High Wind	1/16/1996	0	0	$20,000	$0
High Wind	1/18/1996	0	0	$0	$0
High Wind	1/20/1996	0	0	$0	$0
High Wind	2/20/1996	0	0	$0	$0
High Wind	4/5/1996	0	0	$0	$0
High Wind	4/10/1996	0	0	$0	$0
High Wind	4/11/1996	0	0	$150,000	$0
High Wind	4/23/1996	0	0	$0	$0
High Wind	4/28/1996	0	0	$0	$0
High Wind	5/17/1996	0	0	$0	$0
High Wind	5/23/1996	0	0	$0	$0
High Wind	7/16/1996	1	0	$0	$0
High Wind	10/21/1996	0	0	$0	$0
High Wind	10/25/1996	0	0	$0	$0
High Wind	10/26/1996	0	0	$0	$0
High Wind	11/18/1996	0	0	$0	$0
High Wind	11/19/1996	0	0	$0	$0
High Wind	11/22/1996	0	0	$20,000	$0
High Wind	11/25/1996	0	0	$0	$0
High Wind	11/28/1996	0	0	$0	$0
High Wind	12/7/1996	0	0	$0	$0
High Wind	12/9/1996	0	0	$50,000	$0
High Wind	12/14/1996	3	5	$0	$0
High Wind	12/17/1996	0	0	$$0	$0
High Wind	12/18/1996	0	0	$0	$0
High Wind	12/21/1996	0	0	$75,000	$0
High Wind	12/22/1996	0	0	$0	$0

Event Type	Date	Injuries	Deaths	Property Damage	Crop Damage
High Wind	12/26/1996	0	0	$0	$0
High Wind	12/28/1996	0	0	$0	$0
High Wind	12/29/1996	0	0	$0	$0
High Wind	12/30/1996	0	0	$0	$0
High Wind	1/1/1997	0	0	$0	$0
High Wind	1/5/1997	0	0	$0	$0
High Wind	1/6/1997	0	4	$0	$0
High Wind	1/25/1997	0	0	$0	$0
High Wind	1/29/1997	0	0	$0	$0
High Wind	2/13/1997	0	1	$0	$0
High Wind	2/23/1997	0	0	$0	$0
High Wind	2/24/1997	0	0	$0	$0
High Wind	2/27/1997	0	0	$0	$0
High Wind	3/2/1997	0	0	$0	$0
High Wind	3/3/1997	0	0	$0	$0
High Wind	4/2/1997	0	2	$40,000	$0
High Wind	4/9/1997	0	0	$0	$0
High Wind	9/14/1997	0	0	$0	$0
High Wind	10/6/1997	0	0	$0	$0
High Wind	10/12/1997	0	0	$0	$0
High Wind	10/13/1997	0	0	$0	$0
High Wind	10/25/1997	0	0	$0	$0
High Wind	11/18/1997	0	0	$0	$0
High Wind	11/19/1997	0	0	$0	$0
Strong Wind	3/4/1996	0	0	$5,000	$0
Strong Wind	3/13/1996	0	0	$0	$0
Strong Wind	4/17/1996	0	0	$0	$0
Strong Wind	4/19/1996	0	0	$0	$0
Strong Wind	5/23/1996	0	0	$0	$0
Strong Wind	11/19/1996	0	0	$0	$0
Strong Wind	12/4/1996	0	0	$0	$0
Strong Wind	1/28/1997	0	0	$0	$0
Totals		**4**	**12**	**$120,000**	**$0**

Source: NCDC

Based on SHELDUS data from 1960 to 2012, Calaveras County has experienced numerous high wind events. According to the HMPC, in 2012 a significant wind occurred in the County. The storm knocked

down telephone poles and caused other damages to power poles in the area. A description of other major high wind events in Calaveras County is shown in Table 4-12.

Table 4-12 SHELDUS Events with High Winds in Calaveras County 1960 to 2012

Hazard Begin Date	Hazard End Date	Hazard Type Combo	Injuries	Fatalities	Property Damage	Crop Damage	Remarks
3/1/1995	3/31/1995	Flooding - Severe Storm/Thunder Storm - Wind	0	0	$0.00	$11,241,379.31	Flood, Rain, Winds
12/10/1992	12/11/1992	Flooding - Wind - Winter Weather	0	0	$1,315.79	$0.00	Winter Storm, High Wind, Flash Flood
3/2/1962	3/6/1962	Hail - Severe Storm/Thunder Storm - Wind - Winter Weather	0.02	0.03	$86.21	$0.00	Wind, Rain, Snow, Glaze, and Hail
4/22/1961	4/24/1961	Lightning - Wind - Winter Weather	0	0	$14.71	$14,705.88	Frost, Wind, Lightning
2/1/1960	2/1/1960	Severe Storm/Thunder Storm - Wind	0.03	0.09	$1,470.59	$0.00	Wind, Rain
2/7/1960	2/9/1960	Severe Storm/Thunder Storm - Wind	0.06	0.06	$10,416.67	$10.42	Rain, Wind
2/7/1962	2/26/1962	Severe Storm/Thunder Storm - Wind	0.26	0.35	$86,206.90	$0.00	Wind and Rain
10/11/1963	10/11/1963	Severe Storm/Thunder Storm - Wind	0	0	$14.71	$14.71	Rain and Wind
12/28/1965	12/30/1965	Severe Storm/Thunder Storm - Wind	0	0	$862.07	$0.00	Rain and Wind
1/20/1967	1/31/1967	Severe Storm/Thunder Storm - Wind	0.07	0.02	$8,620.69	$86.21	Rain and Wind
1/8/1970	1/26/1970	Severe Storm/Thunder Storm - Wind	0	0	$10,416.70	$0.00	Rain and Wind
1/9/1980	1/13/1980	Severe Storm/Thunder Storm - Wind	0	0	$1,041.67	$1,041.67	High Winds/Heavy Rain
2/26/1983	2/27/1983	Severe Storm/Thunder Storm - Wind	0.08	0	$10,416.67	$104.17	Heavy Rain, Wind

Hazard Begin Date	Hazard End Date	Hazard Type Combo	Injuries	Fatalities	Property Damage	Crop Damage	Remarks
3/12/1967	3/13/1967	Severe Storm/Thunder Storm - Wind - Winter Weather	0	0	$862.07	$0.00	Snow, Wind, Rain
12/12/1967	12/15/1967	Severe Storm/Thunder Storm - Wind - Winter Weather	0	0.03	$8,620.69	$8,620.69	Wind, Rain, Snow, and Cold
2/20/1969	2/25/1969	Severe Storm/Thunder Storm - Wind - Winter Weather	0.07	0.57	$1,666,666.67	$166,666.67	Wind, Rain, Snow
12/23/1979	12/24/1979	Severe Storm/Thunder Storm - Wind - Winter Weather	0	0	$14,285.71	$0.00	Rain, Snow, Wind
10/9/1960	10/9/1960	Wind	0.02	0.03	$86.21	$0.00	Wind
10/16/1960	10/16/1960	Wind	0	0	$1,136.36	$0.00	Wind
3/16/1961	3/17/1961	Wind	0	0	$862.09	$0.00	Wind
10/7/1961	10/8/1961	Wind	0	0.03	$862.07	$0.00	Wind
10/28/1961	10/29/1961	Wind	0	0	$113.64	$0.00	Wind
9/16/1965	9/17/1965	Wind	0	0	$14,705.88	$1,470.59	North Wind
1/15/1966	1/17/1966	Wind	0	0.05	$11,363.64	$113.64	High Wind
12/22/1982	12/22/1982	Wind	0.21	0.06	$1,041,666.67	$104.17	Wind
1/26/1984	1/27/1984	Wind	0.13	0.07	$3,333.33	$333.33	Wind
2/2/1984	2/2/1984	Wind	0.07	0	$357.14	$0.00	High Wind
8/26/1984	8/26/1984	Wind	0.07	0	$357.14	$357.14	High Winds
10/15/1984	10/15/1984	Wind	0	0	$5,555.56	$0.00	Wind
2/17/1988	2/17/1988	Wind	0	0.03	$8,620.69	$0.00	Wind
2/7/1998	2/7/1998	Wind	0	0	$17,647.06	$0.00	High Wind
6/16/1998	6/16/1998	Wind	0	0	$1,000.00	$0.00	High Wind
10/16/1998	10/16/1998	Wind	0	0	$9,090.91	$0.00	High Wind
11/7/1998	11/7/1998	Wind	0	0	$41,176.47	$0.00	High Wind
4/3/1999	4/3/1999	Wind	0	0	$1,333.33	$2,600.00	High Wind
4/22/1999	4/23/1999	Wind	0	0	$1,538.46	$0.00	High Wind
2/11/2000	2/14/2000	Wind	0	0	$555.56	$2,222.22	High Wind
10/21/2000	10/23/2000	Wind	0	0	$1,739.13	$0.00	High Wind
1/4/2008	1/4/2008	Wind	0	0	$4,869.57	$0.00	High Wind
12/3/1983	12/4/1983	Wind - Winter Weather	0.43	0.07	$357.14	$0.00	Heavy Snow, Wind

Hazard Begin Date	Hazard End Date	Hazard Type Combo	Injuries	Fatalities	Property Damage	Crop Damage	Remarks
12/8/1992	12/9/1992	Wind - Winter Weather	0	0	$2,631.58	$0.00	Winter Storm, High Wind
Total			**1.52**	**1.49**	**$2,992,278.15**	**$11,439,830.82**	

Source: SHELDUS

One tornado was recorded in Calaveras County near Angels Camp during the period from 1950-10/31/2014. It occurred on July 29, 1980 and rated an F0 on the Fujita Scale, which is the lowest rating and is given to tornadoes with wind speeds of 40-72 mph. No property or crop damages, injuries, or deaths were reported.

Likelihood of Future Occurrences

Highly Likely—High wind events occur annually in the County. However, the HMPC noted that current building codes include sufficient wind load factors as part of design criteria for new construction.

Climate Change and Winds (including tornadoes)

According to the CAS, climate change may increase the number of days with high winds in the County. Climate change may increase the number of tornadoes in the County as well, although tornadoes would still be very rare in the County.

4.2.5. Severe Weather: Winter Storms and Extreme Cold

Extreme cold often accompanies snow and winter storms or is left in its wake. It is most likely to occur in the winter months of December, January, and February. Prolonged exposure to the cold can cause frostbite or hypothermia and can become life-threatening. Infants and the elderly are most susceptible. Pipes may freeze and burst in homes or buildings that are poorly insulated or without heat. Extreme cold can disrupt or impair communications facilities. Extreme cold can also affect the crops grown in Calaveras County.

In 2001, the NWS implemented an updated Wind Chill Temperature index (shown in Figure 4-13), which is reproduced below. This index was developed to describe the relative discomfort/danger resulting from the combination of wind and temperature. Wind chill is based on the rate of heat loss from exposed skin caused by wind and cold. As the wind increases, it draws heat from the body, driving down skin temperature and eventually the internal body temperature.

Figure 4-13 Wind Chill Temperature Chart

Wind (mph)	Temperature (°F)																	
Calm	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
45	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98

Frostbite Times: 30 minutes, 10 minutes, 5 minutes

$$\text{Wind Chill (°F)} = 35.74 + 0.6215T - 35.75(V^{0.16}) + 0.4275T(V^{0.16})$$

Where, T= Air Temperature (°F) V= Wind Speed (mph)

Effective 11/01/01

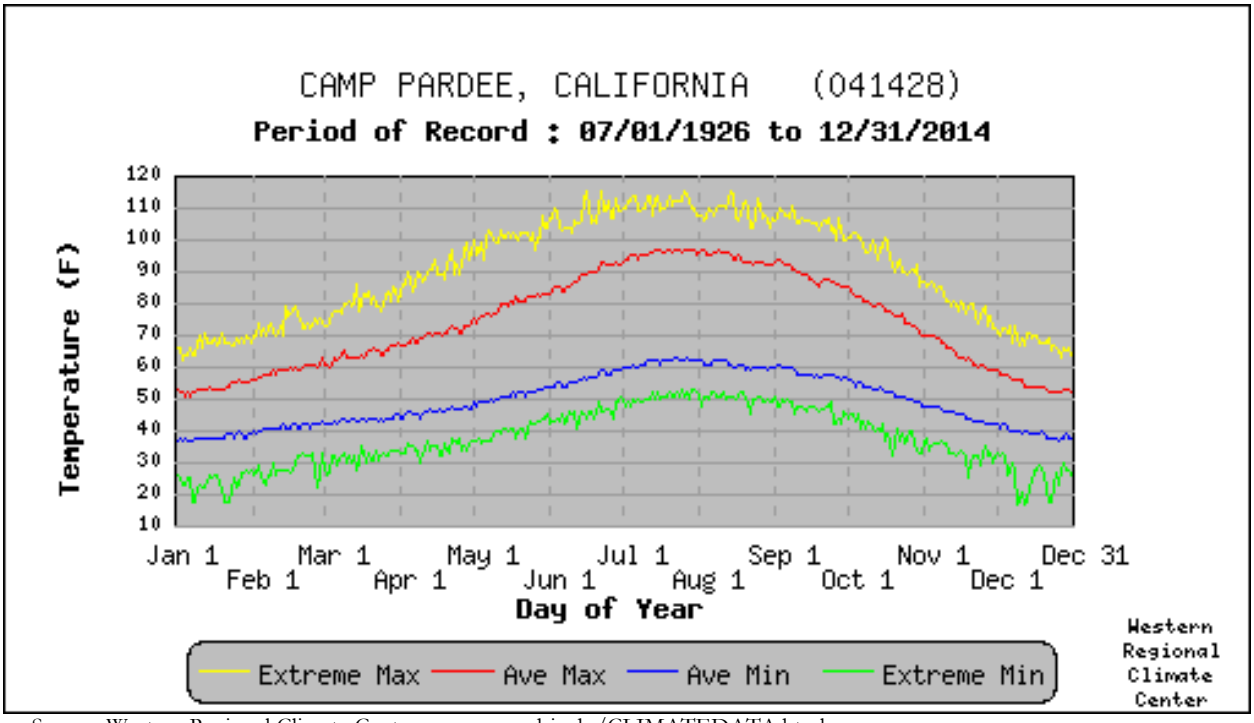
Source: National Weather Service

Information from the two representative weather stations introduced in Section 4.2.2 is summarized below and in Figure 4-14 and Figure 4-15.

In Calaveras County, monthly average minimum temperatures from November through April range from the upper 30s to the upper 50s. The lowest temperature on record at Camp Pardee is 17°F recorded on December 12, 1932. On average, there were 11.3 days annually with a low temperature below 32°F; more than half of these occurred in December and January. At Camp Pardee, temperatures of 32°F or below are on record for every month October through April.

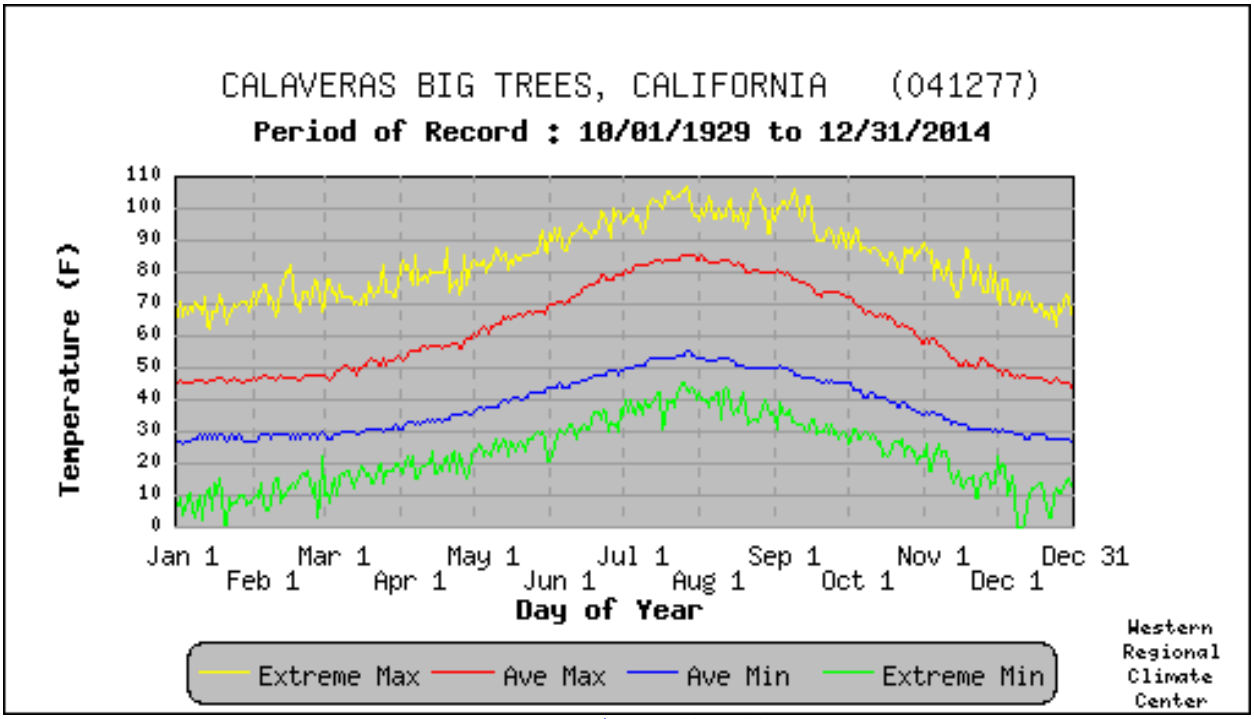
At the Calaveras Big Trees station, the lowest recorded temperature on record is -4°F on February 3, 1932. On average, there are 11.7 days annually that are below 32°F; most occurring in December and January.

Figure 4-14 Daily Temperature Averages and Extremes, Camp Pardee, 1926 to 2014



Source: Western Regional Climate Center, www.wrcc.dri.edu/CLIMATEDATA.html

Figure 4-15 Daily Temperature Averages and Extremes, Calaveras Big Trees, 1948 – 2014

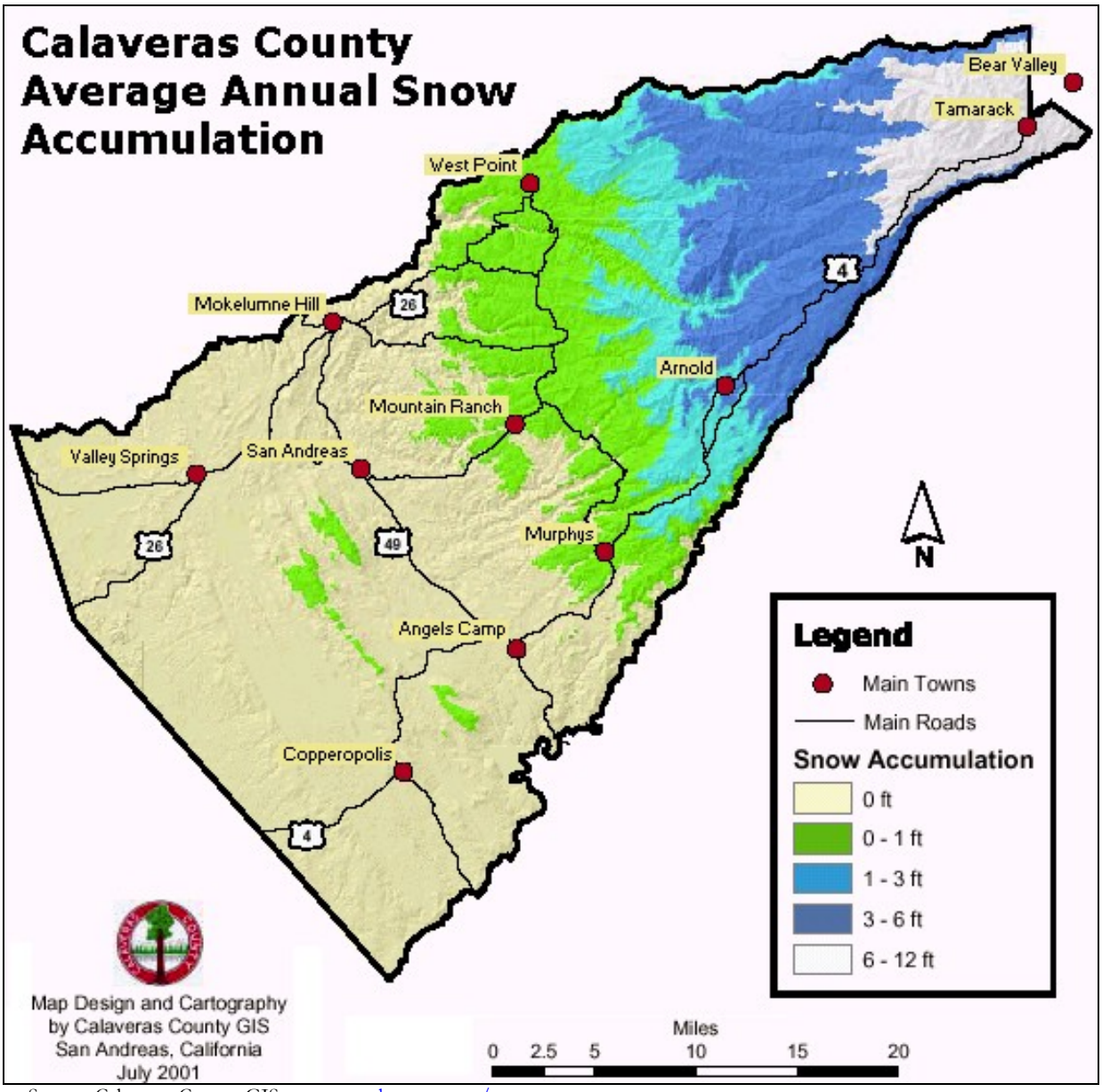


Source: Western Regional Climate Center, www.wrcc.dri.edu/CLIMATEDATA.html

Snow accounts for much of the precipitation in the higher elevations in the eastern part of Calaveras County. Snowfall in the Sierra Nevada Mountains increases with elevation. The lower foothills rarely receive any

measurable snow. Middle elevations receive a mix of snow and rain during the winter. Above 6,000 feet, the majority of precipitation falls as snow. It is not unusual, in some locations, to have ten feet of snow on the ground for extended periods. Figure 4-16 shows the average annual snow accumulation in Calaveras County.

Figure 4-16 Average Annual Snow Accumulation in Calaveras County



Source: Calaveras County GIS, www.co.calaveras.ca.us/comaps.asp

According to the HMPC, winter storms cause icy roads, sometimes making areas impassible. Remote communities, such as West Point and Tamarack, which have only one ingress and egress route, are most vulnerable to the isolating effects of severe winter storms.

Past Occurrences

The NCDC data recorded 28 extreme cold incidents for Calaveras County since 1993. These are shown in Table 4-13.

Table 4-13 NCDC Winter Storms and Extreme Cold Events in Calaveras County 1993-10/31/2014

Event Type	Date	Deaths*	Injuries*	Property Damage*	Crop Damage*
Blizzard	12/22/1996	0	0	$50,000	$0
Cold/Wind Chill	1/13/1997	0	0	$0	$0
Winter Storm	1/15/1996	0	0	$0	$0
Winter Storm	1/18/1996	0	0	$0	$0
Winter Storm	1/23/1996	0	0	$0	$0
Winter Storm	1/26/1996	0	0	$0	$0
Winter Storm	2/18/1996	0	0	$0	$0
Winter Storm	2/22/1996	0	0	$0	$0
Winter Storm	2/25/1996	0	0	$0	$0
Winter Storm	2/26/1996	0	0	$0	$0
Winter Storm	2/27/1996	0	0	$0	$0
Winter Storm	3/4/1996	0	0	$0	$0
Winter Storm	4/15/1996	0	0	$0	$0
Winter Storm	10/29/1996	0	0	$0	$0
Winter Storm	12/1/1996	0	0	$0	$0
Winter Storm	12/4/1996	0	0	$0	$0
Winter Storm	12/9/1996	0	0	$0	$0
Winter Storm	12/20/1996	2	0	$75,000	$0
Winter Storm	12/21/1996	0	0	$50,000	$0
Winter Storm	12/26/1996	0	0	$0	$0
Winter Storm	1/5/1997	0	0	$0	$0
Winter Storm	1/12/1997	0	1	$0	$0
Winter Storm	1/14/1996	0	0	$0	$0
Winter Storm	1/20/1997	0	0	$0	$0
Winter Storm	1/21/1997	0	0	$0	$0
Winter Storm	2/17/1997	0	0	$0	$0
Winter Weather	12/9/1996	0	0	$0	$0
Winter Weather	1/7/1997	14	0	$0	$0
Totals		**16**	**1**	**$125,000**	**$0**

Source: NCDC
*Deaths, injuries, and damages are for the entire event, and may not be exclusive to the County.

Based on SHELDUS data from 1960 to 2012, Calaveras County has experienced numerous winter weather (including snow and freeze) events. A description of major winter weather and freeze events in Calaveras County is shown in Table 4-14.

Table 4-14 SHELDUS Winter Weather Events for Calaveras County 1960 to 2012

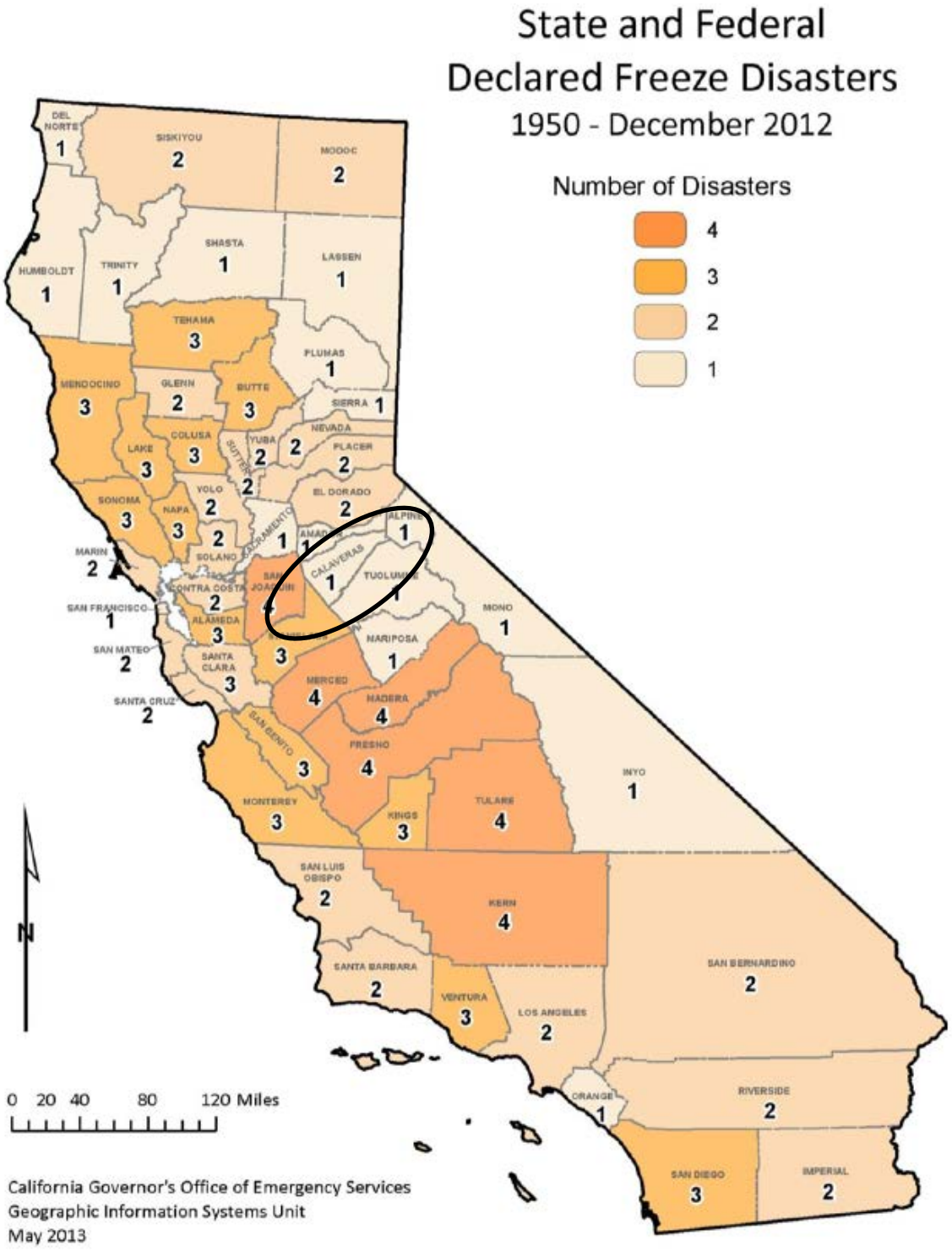
Hazard Begin Date	Hazard End Date	Hazard Type Combo	Injuries	Fatalities	Property Damage	Crop Damage	Remarks
1/20/1962	1/21/1962	Winter Weather	0.86	0.12	$8,620.69	$0.00	Winter Storm
4/27/1970	4/29/1970	Winter Weather	0	0	$0.00	$11,627.91	Freeze
1/27/1981	1/29/1981	Winter Weather	0	0	$1,041.67	$0.00	Winter Storm
12/22/1982	12/22/1982	Winter Weather	1	0	$2,941.18	$0.00	Snow
1/26/1983	1/26/1983	Winter Weather	0.09	0	$4,545.45	$0.00	Snow
11/23/1983	11/23/1983	Winter Weather	0.14	0	$357.14	$0.00	Snow
12/23/1983	12/24/1983	Winter Weather	0.07	0	$357.14	$0.00	Heavy Snow
2/5/1989	2/5/1989	Winter Weather	0	0	$0.00	$128,205.13	Record Cold
2/15/1990	2/17/1990	Winter Weather	0	0	$2,631.58	$0.00	Winter Storm
2/15/1990	2/15/1990	Winter Weather	0	0	$0.00	$3,333.33	Freeze
12/20/1990	12/25/1990	Winter Weather	0	0.05	$86,206.90	$8,620,689.66	Cold Wave
2/5/1992	2/16/1992	Winter Weather	0.22	0.05	$0.00	$0.00	Winter Storm
2/9/1992	2/11/1992	Winter Weather	0	0	$892.86	$0.00	Winter Storm
12/6/1992	12/7/1992	Winter Weather	0.13	0	$1,562.50	$0.00	Winter Storm
12/17/1992	12/17/1992	Winter Weather	0	0	$3,846.15	$0.00	Winter Storm
12/31/1992	1/1/1993	Winter Weather	0	0	$27,777.78	$0.00	Winter Storm
2/17/1993	2/21/1993	Winter Weather	0.11	0	$2,631.58	$0.00	Winter Storm
12/11/1993	12/11/1993	Winter Weather	0	0	$3,448.28	$0.00	Winter Storm
1/23/1994	1/24/1994	Winter Weather	0	0	$1,851.85	$0.00	Heavy Snow

Hazard Begin Date	Hazard End Date	Hazard Type Combo	Injuries	Fatalities	Property Damage	Crop Damage	Remarks
2/6/1994	2/8/1994	Winter Weather	0	0	$3,333.33	$0.00	Winter Storm
2/16/1994	2/21/1994	Winter Weather	0	0	$1,282.05	$0.00	Winter Storm
12/20/1996	12/20/1996	Winter Weather	0.14	0.07	$0.00	$0.00	Heavy Snow
12/5/1998	12/6/1998	Winter Weather	0	0	$20,000.00	$0.00	Winter Storm
12/19/1998	12/29/1998	Winter Weather	0	0	$0.00	$141,176.47	Extreme Cold
4/8/2005	4/10/2005	Winter Weather	0	0	$3,076.92	$0.00	Winter Storm
1/14/2007	1/15/2007	Winter Weather	0	0	$57,142.86	$0.00	Frost/Freeze
Total			**2.76**	**0.29**	**$233,547.91**	**$8,905,032.50**	

Source: SHELDUS

Figure 4-17 shows disaster declarations due to freeze in the County. The greatest concentrations are in the Central Valley. The disaster declaration for Calaveras County was issued in 1969.

Figure 4-17 Calaveras County Freeze Declarations from 1950 to 2012



Source: 2013 California State Multi-Hazard Mitigation Plan

Likelihood of Future Occurrences

Highly Likely—28 winter weather and freeze events occurred in Calaveras County over 22 years (1993-2014) of record keeping which equates to one event every 0.8 years, on average, and a 100 percent chance of extreme cold occurring in any given year.

Climate Change and Extreme Winter Weather

According to the CAS, although heat waves will likely become more frequent, there is also the potential for continued cold outbreaks in winter, even in an overall warmer climate. This could possibly alter the risk of the County to extreme winter weather. Changes in snowfall patterns due to climate change may also occur.

4.2.6. Agricultural Hazards

Hazard/Problem Description

According to the Calaveras County Agricultural Commissioner's Office, agricultural production in Calaveras County is the most significant contributor to the local economy. The Agricultural Commissioner estimated agricultural products value at $29 million in 2014. In addition to the $29 million in annual production value, there are hundreds of jobs directly tied to that production and thousands more that are impacted indirectly in the production, processing, transportation, and marketing of those commodities. It is estimated that there is approximately a four to one ratio for crops grown in this region, so $29 million in production value is actually a $106 million impact on the local economy.

According to the US Department of Agriculture (USDA), every year natural disasters, such as droughts, earthquakes, extreme heat and cold, floods, fires, earthquakes, hail, landslides, and tornadoes, challenge agricultural production. Because agriculture relies on the weather, climate, and water availability to thrive, it is easily impacted by natural events and disasters. Agricultural impacts from natural events and disasters most commonly include: contamination of water bodies, loss of harvest or livestock, increased susceptibility to disease, and destruction of irrigation systems and other agricultural infrastructure. These impacts can have long lasting effects on agricultural production including crops, forest growth, and arable lands, which require time to mature.

In addition to natural disasters, Calaveras County is at risk from many insects and plants that, under the right circumstances, can cause severe economic, environmental, or physical harm. Invasive pest species affecting crop production can result in economic disasters in a very short period of time. These hazards can have a major economic impact on farmers, farm workers, packers, and shippers of agricultural products.

They can also cause significant increases in food prices to the consumer due to increases in production cost and shortages. Under some conditions, pest species that have been present, and relatively harmless, can become invasive hazards. For example, severe drought conditions can weaken tree and vine crops and make them more susceptible to insect attack and disposing them to secondary microbial attack.

This hazard addresses the issues related to natural hazards, as well as pests and plants that pose a concern to the County. The Ag Commissioner and the HMPC both noted that Calaveras County is also at risk to

noxious weeds that can affect both waterways and agricultural crops. These hazards can have major impact on farmers, farm workers, packers, and shippers of products, as well as those who use waterways for recreation or for water supply.

Calaveras County Agricultural Industry

Calaveras County contains a diverse agricultural environment including fertile arable land, range land, and timber. Total 2013 crop production value of $29,021,500 represented a 2.1% decrease in values from the previous year. Table 4-15 shows the total value of all agricultural products in Calaveras from 2008 to 2013.

Table 4-15 Calaveras County Gross Value of Agricultural Production, 2008 to 2013

Commodity	2008	2009	2010	2011	2012	2013
Livestock and Poultry	$9,399,800	$9,087,300	$11,190,000	$10,689,000	$13,508,000	$11,801,500
Livestock and Poultry Products	$21,000	$21,000	$22,000	$25,000	$30,000	$23,000
Field Crops	$3,521,900	$3,558,500	$3,593,800	$3,597,000	$3,608,000	$3,597,000
Vegetable Crops	$200,000	$200,000	$200,000	$225,000	$273,000	$200,000
Fruit and Nut Crops	$2,092,000	$4,490,800	$4,349,000	$4,596,000	$5,044,000	$6,134,000
Apiary Products	$82,300	$91,400	$91,000	$81,000	$91,000	$150,000
Nursery Products	$412,500	$410,000	$420,000	$324,000	$346,000	$221,000
Timber	$4,720,000	$2,473,000	$1,183,000	$4,145,000	$6,755,000	$6,895,000
Total	**$20,449,500**	**$20,332,000**	**$21,965,800**	**$23,782,000**	**$29,655,000**	**$29,021,500**

Source: Calaveras County Agricultural Commissioner's Crop Reports, 2008-2013

Past Occurrences

According to the California Invasive Plants Council, there are currently five "A" rated weed pests under eradication in Calaveras County. County operated eradication projects include Scotch Thistle, Spotted Knapweed, Spotted-diffuse knapweed, Diffuse knapweed, and Plumeless Thistle. In addition, stink wort has recently been named a noxious weed affecting Calaveras County. The California Department of Food and Agriculture (CDFA) has eradicated the water weed Hydrilla from waterways within Calaveras County.

Agricultural-related disasters are quite common. One-half to two-thirds of the counties in the United States have been designated as disaster areas in each of the past several years. Producers may apply for low-interest emergency (EM) loans in counties named as primary or contiguous under a disaster designation. Natural disaster conditions include: a blizzard, cyclone, earthquake, hurricane, tornado, severe hail, excessive rain, heavy snow, ice and/or high wind, an electrical storm, several weather patterns sustained over a period of time, including low or high temperatures, and related pests, epidemics or fires. The USDA Secretarial Disaster Declarations for Calaveras County since 2008 are shown on Table 4-16.

Table 4-16 Calaveras County Secretarial Disaster Designations

Disaster Designation	Designation Date	Disaster Type	Primary or Contiguous County
S1449	7/15/2008	Extreme Cold	Primary
S3351	8/22/2012	Drought	Contiguous
S3379	9/5/2012	Drought	Contiguous
S3452	12/29/2012	Drought	Contiguous
S3547	7/3/2013	Drought	Contiguous
S3558	7/31/2013	Drought	Primary
S3569	8/21/2013	Drought	Contiguous
M4158	12/13/2013	Drought	Contiguous
S3626	1/15/2014	Drought	Primary
S3743	9/17/2014	Drought	Primary
S3784	2/4/2015	Drought	Primary

Source: USDA

Likelihood of Future Occurrence

Highly Likely – Due to the number of different types of insects and weeds that can affect Calaveras County, it is highly likely that in any given year there will be agricultural hazards. The extent to which these hazards affect the County varies as to how quickly the hazard can be eradicated.

Climate Change and Agricultural Hazards

According to the CAS, climate change may cause increased heat, and the droughts that can accompany it can affect the crops, timber industry, and livestock that reside in the County. This could have economic impacts to the County's $29 million agricultural industry.

4.2.7. Avalanche

Hazard/Problem Description

According to the Sierra Avalanche Center, avalanches occur when loading of new snow increases stress at a rate faster than strength develops, and the slope fails. Critical stresses develop more quickly on steeper slopes and where deposition of wind-transported snow is common. The vast majority of avalanches occur during or shortly after storms. This hazard generally affects a small number of people, such as snowboarders, skiers, and hikers, who venture into backcountry areas during or after winter storms. Roads and highway closures, damaged structures, and destruction of forests are also a direct result of avalanches. The combination of steep slopes, abundant snow, weather, snowpack, and an impetus to cause movement creates avalanches. Areas prone to avalanche hazards include hard to access areas deep in the backcountry. Avalanche hazards exist in eastern Calaveras County where combinations of the above criteria occur.

Past Occurrences

Historically, avalanches occur in California between the months of December and March, following snowstorms. Although avalanches have occurred on slopes of many angles, they most often occur on slopes ranging between 30 degrees and 45 degrees. Therefore ski resorts, residences, roads, businesses, and other structures and activities in these areas are vulnerable.

The NCDC showed one past event for avalanche, but it was located in nearby Lake Tahoe, and not within the County borders. SHELDUS show no past occurrences of avalanche in the County. The HMPC noted that no damaging avalanches have affected the County. However, smaller avalanches occur on a regular basis in the back country of the County with limited or no damaging affects

Likelihood of Future Occurrence

Unlikely – there have been no previous occurrences of avalanche in the County.

Climate Change and Avalanche

According to the CAS, climate change may exacerbate the avalanche hazard in the County. Avalanches stemming from a weather pattern of heavy snowfalls followed by thawing may increase – a dangerous combination that can be expected with global warming.

4.2.8. Dam Failure

Hazard/Problem Description

According to the California Department of Water Resources (Cal DWR) Division of Safety of Dams, dams are manmade structures built for a variety of uses including flood protection, power generation, agriculture, water supply, and recreation. When dams are constructed for flood protection, they are usually engineered to withstand a flood with a computed risk of occurrence. For example, a dam may be designed to contain a flood at a location on a stream that has a certain probability of occurring in any one year. If prolonged periods of rainfall and flooding occur that exceed the design requirements, that structure may be overtopped and fail. Overtopping is the primary cause of earthen dam failure in the United States.

Dam failures can also result from any one or a combination of the following causes:

- Earthquake;
- Inadequate spillway capacity resulting in excess overtopping flows;
- Internal erosion caused by embankment or foundation leakage, or piping or rodent activity;
- Improper design;
- Improper maintenance;
- Negligent operation; and/or
- Failure of upstream dams on the same waterway.

Water released by a failed dam generates tremendous energy and can cause a flood that is catastrophic to life and property. A catastrophic dam failure could challenge local response capabilities and require

evacuations to save lives. Impacts to life safety will depend on the warning time and the resources available to notify and evacuate the public. Major loss of life could result as well as potentially catastrophic effects to roads, bridges, and homes. Electric generating facilities and transmission lines could also be damaged and affect life support systems in communities outside the immediate hazard area. Associated water supply, water quality and health concerns could also be an issue. Factors that influence the potential severity of a full or partial dam failure are the amount of water impounded; the density, type, and value of development and infrastructure located downstream; and the speed of failure.

In general, there are three types of dams: concrete arch or hydraulic fill, earth and rockfill, and concrete gravity. Each type of dam has different failure characteristics. A concrete arch or hydraulic fill dam can fail almost instantaneously; the flood wave builds up rapidly to a peak then gradually declines. An earth-rockfill dam fails gradually due to erosion of the breach; a flood wave will build gradually to a peak and then decline until the reservoir is empty. And, a concrete gravity dam can fail instantaneously or gradually with a corresponding buildup and decline of the flood wave.

Dams and reservoirs have been built throughout California to supply water for agriculture and domestic use, to allow for flood control, as a source of hydroelectric power, and to serve as recreational facilities. The storage capacities of these reservoirs range from a few thousand acre feet to five million acre-feet. The water from these reservoirs eventually makes its way to the Pacific Ocean by way of several river systems.

The Division of Safety of Dams assigns hazard ratings to large dams within the State. The following two factors are considered when assigning hazard ratings: existing land use and land use controls (zoning) downstream of the dam. Dams are classified in three categories that identify the potential hazard to life and property:

- **High hazard** indicates that a failure would most probably result in the loss of life
- **Significant hazard** indicates that a failure could result in appreciable property damage
- **Low hazard** indicates that failure would result in only minimal property damage and loss of life is unlikely

Dam locations of high, significant, and low hazard dams in Calaveras County are shown in Figure 4-18. High and significant hazard dams that may affect the County are also shown on Figure 4-18. Details of high, significant, and low hazard dams inside the County are shown in Table 4-17.

Figure 4-18 Dams in or Near Calaveras County

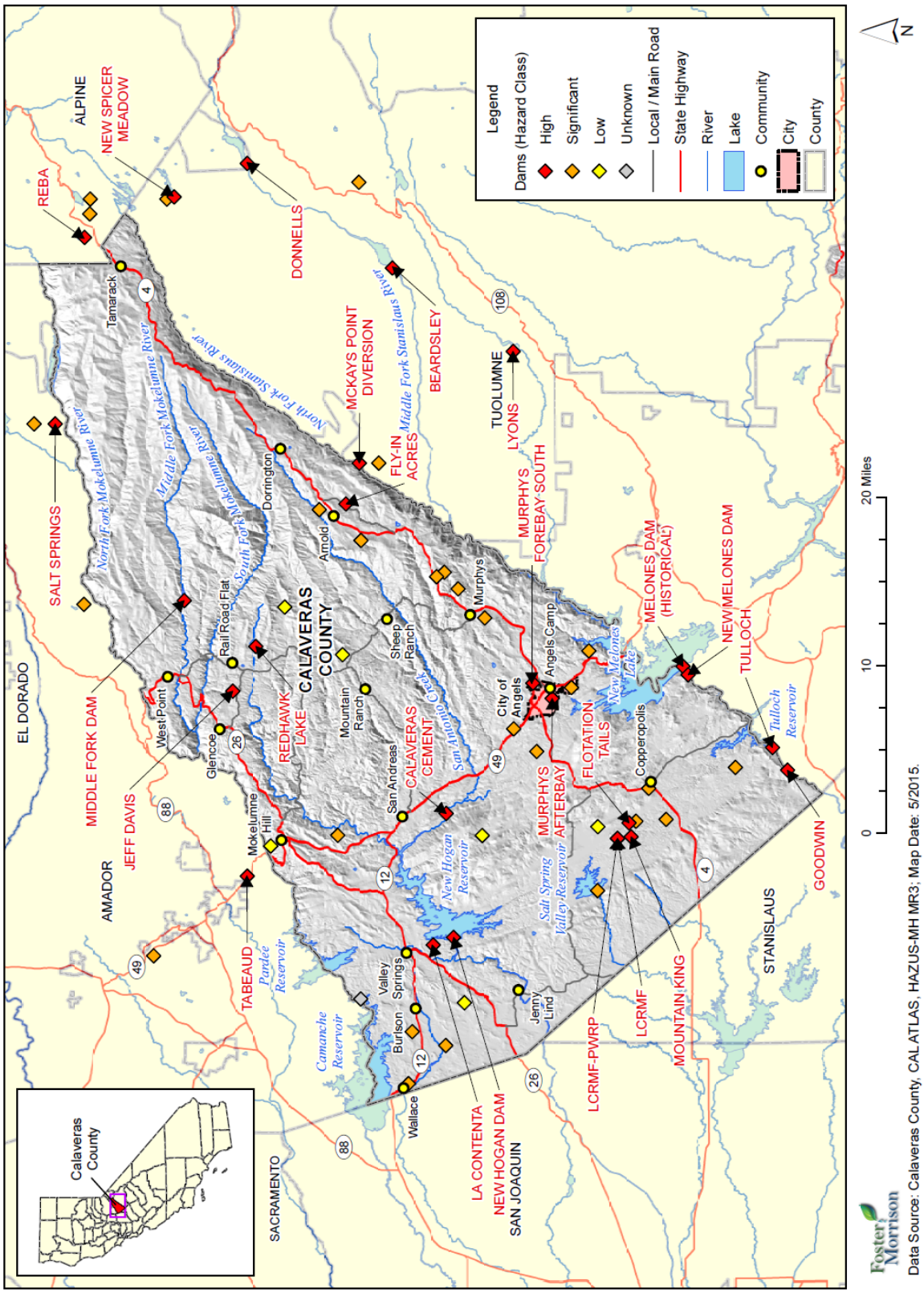


Table 4-17 High (H), Significant (S), and Low (L) Hazard Dams in Calaveras County

Name of Dam	Hazard Class	Mapped	Stream	Nearest City/ Distance	Population At Risk	Capacity (acre-feet)	Dam Height	Dam Owner
Calaveras Cement	H	Mapped	South Fork Calaveras River	–	> 1,000	112,500	186	Oakdale So San Joaquin Id
Chatom Vineyards # 1	H	Not mapped	Indian Creek	–	> 1,000	3,100	83	Meridian Gold Company
Flotation Tails	H	Mapped	Littlejohns Creek Tributary	–	> 1,000	–	–	–
Fly-In-Acres	H	Mapped	Moran Creek	Avery 4 miles	100 – 1,000	–	30	Robert J Matteoli, Et Al
Goodwin	H	Mapped	Stanislaus River	Knights Ferry 4 miles	100 – 1,000	–	–	–
Jeff Davis	H	Mapped	Wet Gulch Creek	Glencoe 2.5 miles	10 - 100	–	–	–
La Contenta	H	Mapped	Cosgrove Spring Tributary	Rancho Calaveras 1.5 miles	100 – 1,000	68,400	205	Tri-Dam Project - Operator
LCRMF	H	Mapped	Clover Creek Tributary	–	> 1,000	2,760	33	Calaveras PU District
LCRMF-PWRP	H	Mapped	Offstream	–	> 1,000	2,100	233	Calaveras County Water District
Leach Site 1	H	Not mapped	Coyote Creek Tributary	–	> 1,000	1,800	114	Calaveras PU District
Leach Site 2	H	Not mapped	Coyote Creek Tributary	–	> 1,000	1,700	98	Calaveras PU District
Matteoli	H	Not mapped	Calaveritas Creek Tributary	–	> 1,000	54	67	Utica Power Authority
McKays Point Diversion	H	Mapped	North Fork Stanislaus River	Melones 22 miles	> 1,000	630	53	M-24 Ranch Association
Melones	H	Mapped	Stanislaus River	–	> 1,000	93	19	Patricia Mccarty
Middle Fork	H	Mapped	Middle Fork Mokelumne River	Wilseyville 4 miles	10 - 100	90	29	Ryan Voorhees

Name of Dam	Hazard Class	Mapped	Stream	Nearest City/ Distance	Population At Risk	Capacity (acre-feet)	Dam Height	Dam Owner
Mountain King	H	Mapped	Clover Creek	–	> 1,000	10,900	47	Rock Creek Water District
Murphys Afterbay	H	Mapped	Angels Creek Tributary	Murphys 0.1 miles	100 – 1,000	1,715	44	Meridian Gold Company
Murphys Forebay	H	Mapped	Angels Creek Tributary	Murphys 1 mile	100 – 1,000	724	41	Oak Canyon Ranch, LLC
New Hogan	H	Mapped	Calaveras River	–	> 1,000	410	29	Wallace Community Services District
New Melones	H	Mapped	Stanislaus River	–	> 1,000	262	35	Calaveras County Water District
Redhawk Lake	H	Mapped	North Fork Calaveras River	San Andreas 15 miles	100 – 1,000	250	25	Robert & Lynn Wilson
Tulloch	H	Mapped	Stanislaus River	Knights Ferry 5.5 miles	100 – 1,000	124	35	Lake Mont Pines Homeowners
Andrew Cademartori	S	Mapped	Seasonal Stream	Murphys 1 mile	10 - 100	2,400,000	578	US Bureau Of Reclamation
Cherokee	S	Mapped	Cherokee Creek	San Andreas 10 miles	10 - 100	128	126	Carson Hill Gold Mining Corp
Copper Cove	S	Mapped	Littlejohns Creek Tributary	Knights Ferry 8 miles	10 - 100	57	14	Genstar Cement Company
Copperopolis	S	Mapped	Penney Creek	Copperopolis 0.5 miles	10 - 100	47	35	Meridian Gold Company
Ferrario	S	Mapped	Bear Creek tributary	Wallace 3.5 miles	10 - 100	–	–	–
Flowers	S	Mapped	Little Johns Creek	Oakdale 26 miles	10 - 100	–	35	Gay Callan
Forest Meadows	S	Mapped	Angels Creek	Murphys 1.5 miles	10 - 100	–	–	–
Hein	S	Mapped	Bear Creek Tributary	Wallace 4 miles	10 - 100	–	–	–
Holman	S	Mapped	Angels Creek Tributary	–	0	–	–	–
Hunters	S	Mapped	Mill Creek	Hathaway Pines 0.5 miles	10 - 100	–	–	–

Name of Dam	Hazard Class	Mapped	Stream	Nearest City/ Distance	Population At Risk	Capacity (acre-feet)	Dam Height	Dam Owner
Murphys Wastewater	S	Mapped	Offstream	Arab 6 miles	10 - 100	630	44	Calvin C Berger/Barbara G Berger
Pine Peak No 4	S	Mapped	North Fork of Calaveras Tributary	Valley Sprinds 10 miles	1 - 10	253	57	Utica Power Authority
Ross	S	Mapped	French Gulch Cr	Angels City 4 miles	1 - 10	225	33	Jon & Angelita Janofsky
Salt Springs Valley	S	Mapped	Rock Creek	Milton 5 miles	10 - 100	205	42	Calaveras County Water District
Skyrocket	S	Mapped	Littlejohn Creek	Telegraph City 5 miles	1 - 10	150	70	Sutton Enterprises
Stevenot	S	Mapped	Carson Creek Tributary	Angels City 3 miles	10 - 100	145	16	Naki Inc.
Tanner	S	Mapped	Cowell Creek	Sheep Ranch 6 miles	10 - 100	140	24	Murphys Sanitation District
Wallace	S	Mapped	Bear Creek Tributary	Wallace 0.3 miles	10 - 100	117	60	Sierra Golf Management
White Pines	S	Mapped	San Antonio Creek	Fourth Crossing 22 miles	10 - 100	73	45	The Mariner Group
Bevanda	L	Mapped	Calaveras River Tributary	Bellota 11 miles	10 - 100	317,000	210	Corps Of Engineers
Christensen No. 1	L	Mapped	Steele Creek	Fourth Crossing 4 miles	1 - 10	64	20	Meridian Gold Company
Emery	L	Mapped	Mckinneys Creek	Calaveras 2.3 miles	10 - 100	38	52	East Bay Mu District
McCarty	L	Mapped	Johnny Creek Tributary	Copperopolis 4.5 miles	10 - 100	40	42	Utica Power Authority
Mokelumne Hill	L	Mapped	Mokelumne River Tributary	Scottsville 4 miles	1 - 10	69	33	Rancho Campana, LLC
Reid	L	Mapped	Esperanza Creek	Jesus Maria 11 miles	1 - 10	250	101	City Of Angels
Copperopolis Tailing	Not identified	Not mapped	–	–	> 1,000	43	67	Carson Hill Gold Mining Corp

Name of Dam	Hazard Class	Mapped	Stream	Nearest City/ Distance	Population At Risk	Capacity (acre-feet)	Dam Height	Dam Owner
Lewallen C	Not identified	Not mapped	–	–	> 1,000	500	101	Tri-Dam Project - Operator
Lewallen D	Not identified	Not mapped	–	–	> 1,000	172	43	Calaveras County Water District
Maskus	Not identified	Not mapped	–	–	> 1,000	58	41	Blue Lakes Springs Homeowners
Stull	Not identified	Not mapped	–	–	> 1,000	142	80	Union Public Utility District
Wilson	Not identified	Not mapped	–	–	> 1,000	60	36	Calaveras County Water District
Cherokee	Not identified	Not mapped	–	–	> 1,000	391	45	Meridian Gold Company
Mine Run	Not identified	Mapped	Mine Run Creek	–	> 1,000	70	32	Raymond J Vernazza
Moosehead Debris	Not identified	Not mapped	–	–	> 1,000	52	52	Mokelumne Hill Sanitation District

Source: Cal OES

There are dams located outside of Calaveras County that may potentially affect the County. Details of high and significant hazard dams outside the County that may affect the County are shown in Table 4-18.

Table 4-18 High and Significant Hazard Dams That May Affect Calaveras County

Name	Hazard	County Name	Owner	River	Near City	EAP
Beardsley	H	Tuolumne	South San Joaquin and Oak	Middle Fork Stanislaus River	Sonora	Y
Donnells	H	Tuolumne	South San Joaquin and Oak	Middle Fork Stanislaus River	Sonora	Y
Lyons	H	Tuolumne	Pacific Gas and Electric	South Fork Stanislaus River	Long Barn	Y
New Spicer Meadow	H	Tuolumne	Calaveras Co Water District	Highland Creek	Big Meadow	Y
Reba	H	Alpine	Lake Alpine Water Company	Tributary Bloods Creek	Lombardi	Y
Salt Springs	H	Amador/ Calaveras	Pacific Gas And Electric	North Fork Mokelumne River	Pioneer	Y
Tabeaud	H	Amador	Pacific Gas And Electric	South Fork Jackson Creek - tributary	Jackson	Y
Alpine Auxiliary No. 2	S	Alpine	Northern California Power	Silver Creek	Bear Valley	Y

Name	Hazard	County Name	Owner	River	Near City	EAP
Alpine Auxiliary No. 3	S	Alpine	Northern California Power	Silver Creek	Bear Valley	Y
Alpine Auxiliary No. 4	S	Alpine	Northern California Power	Silver Creek	Bear Valley	Y
Alpine Main	S	Alpine	Northern California Power	Silver Creek	Bear Valley	Y
Bear River	S	Amador	Pac Gas And Electric Co	Bear River		Y
Leland Meadows	S	Tuolumne	Leland Meadows Water District	Leland Creek	Cow Creek	Y
Lower Bear	S	Amador	Pacific Gas And Electric	Bear River	Pioneer	Y
New Spicer Meadow	S	Tuolumne	Calaveras County Water District	Highland Creek	Arnold	Y
Tiger Cr Regulator	S	Amador	Pac Gas And Electric Co	Tiger Creek	Clements	Y
Upper Bear	S	Amador	Pacific Gas And Electric	Bear River	Pioneer	Y
Upper Blue Lake	S	Alpine	Pacific Gas And Electric	Blue Creek	Kirkwood	Y
Utica Auxiliary No. 2	S	Alpine/ Tuolumne	Northern California Power	North Fork Stanislaus - Tributary	Bear Valley	Y
Utica Auxiliary No. 3	S	Alpine/ Tuolumne	Northern California Power	North Fork Stanislaus - Tributary	Bear Valley	Y
Utica Auxiliary No. 4	S	Alpine/ Tuolumne	Northern California Power	North Fork Stanislaus - Tributary	Bear Valley	Y
Utica Auxiliary No. 5	S	Alpine/ Tuolumne	Northern California Power	North Fork Stanislaus - Tributary	Bear Valley	Y
Utica Main	S	Alpine/ Tuolumne	Northern California Power	North Fork Stanislaus - Tributary	Bear Valley	Y

Source: Cal OES

The catastrophic failure of any of the County's large dams including New Melones, Hogan, Tulloch, Hunters, McKays, Spicer, Camanche, and Pardee Dams could result in property damage and loss of life. Foremost, are injuries, loss of life, limited transportations routes and a decrease in vital utilities. Additionally, because of Calaveras County's strong agricultural influences significant downstream property damage and the loss of domestic and farm production animals will be a major concern.

Previous Occurrences

According to the HMPC and a search of the National Performance of Dams Program database, there is a history of dam failure in Calaveras County. In 1895, the Angels Dam collapsed, resulting in one fatality. The cause cited for the failure was flooding that undermined the poorly constructed dam foundation. In 1997, the Don Pedro Dam in neighboring Tuolumne County had an uncontrolled release when the gate was opened, resulting in flooding across a 300 square-mile area that included parts of Calaveras County. In

addition, in April of 2006, flooding caused significant damage and threat of failure to a small dam at Peachtree Pond near Valley Springs. Also, in 1997 an uncontrolled release occurred at Melones dam, causing damages in the County. Exact damages were not available for inclusion into this plan. The County has also been one storm away from opening the gate at the Hogan dam. An uncontrolled release from the Hogan dam would cause significant damages in Calaveras County.

Probability of Future Occurrence

Occasional—With only a single previous occurrence of actual dam failure, probability of future occurrence is difficult to accurately estimate for dam failure. Because dam failure is a manmade hazard, the methodology for calculating probability based on past occurrences does not necessarily reflect the actual risk of future occurrence. Another way to estimate future occurrence is to consider the probability of other hazards that are considered causes or contributing factors of dam failure. These include flooding and earthquake, which are classified as likely and unlikely respectively. Based on historical conditions, a primary concern of the planning area is not just a dam failure, but heavy rains and flooding causing flood control gates to be opened, resulting in uncontrolled releases that could cause substantial damage in the County.

Climate Change and Dam Failure

Increases in both precipitation and heat causing snow melt could increase the potential for dam failure and uncontrolled releases in Calaveras County.

4.2.9. Drought and Water Shortage

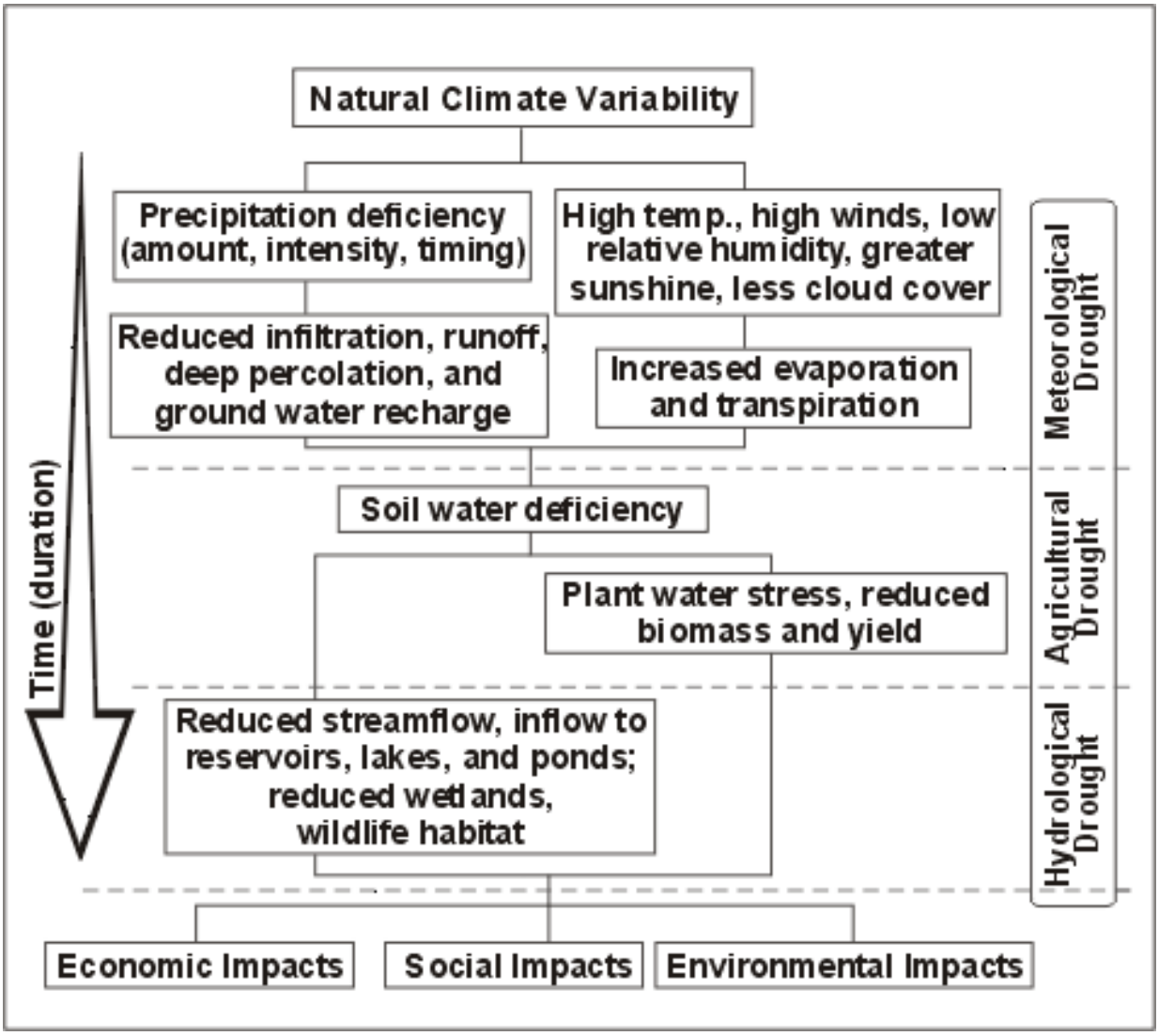
Hazard/Problem Description

According to the National Drought Mitigation Center, drought is a gradual phenomenon. Although droughts are sometimes characterized as emergencies, they differ from typical emergency events. Most natural disasters, such as floods or forest fires, occur relatively rapidly and afford little time for preparing for disaster response. Droughts occur slowly, over a multi-year period, and it is often not obvious or easy to quantify when a drought begins and ends.

Drought is a complex issue involving (see Figure 4-19) many factors—it occurs when a normal amount of moisture is not available to satisfy an area's usual water-consuming activities. Drought can often be defined regionally based on its effects:

- **Meteorological** drought is usually defined by a period of below average water supply.
- **Agricultural** drought occurs when there is an inadequate water supply to meet the needs of the state's crops and other agricultural operations such as livestock.
- **Hydrological** drought is defined as deficiencies in surface and subsurface water supplies. It is generally measured as streamflow, snowpack, and as lake, reservoir, and groundwater levels.
- **Socioeconomic** drought occurs when a drought impacts health, well-being, and quality of life, or when a drought starts to have an adverse economic impact on a region.

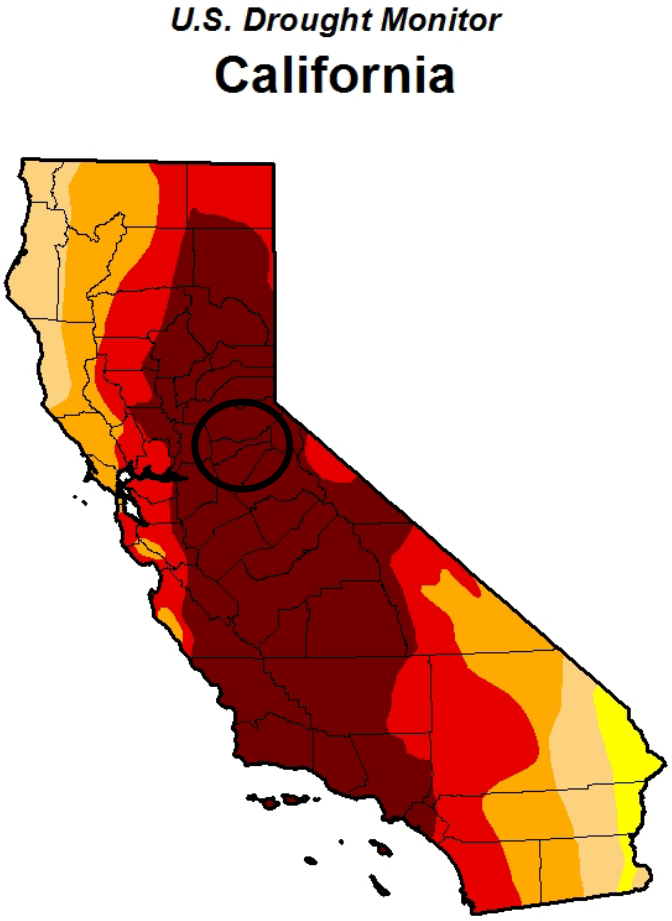
Figure 4-19 Causes and Impacts of Drought



Source: National Drought Mitigation Center

Drought in the United States is monitored by the National Integrated Drought Information System (NIDIS). A major component of this portal is the U.S. Drought Monitor. The Drought Monitor concept was developed jointly by the NOAA's Climate Prediction Center, the NDMC, and the USDA's Joint Agricultural Weather Facility in the late 1990s as a process that synthesizes multiple indices, outlooks and local impacts, into an assessment that best represents current drought conditions. The final outcome of each Drought Monitor is a consensus of federal, state, and academic scientists who are intimately familiar with the conditions in their respective regions. A snapshot of the drought conditions in California and the planning area can be found in Figure 4-20.

Figure 4-20 Current Drought Status in Calaveras County



	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	97.33	87.55	69.07	44.84
Last Week 12/29/2015	0.00	100.00	97.33	87.55	69.07	44.84
3 Months Ago 10/6/2015	0.14	99.86	97.33	92.36	71.08	46.00
Start of Calendar Year 12/29/2015	0.00	100.00	97.33	87.55	69.07	44.84
Start of Water Year 9/29/2015	0.14	99.86	97.33	92.36	71.08	46.00
One Year Ago 1/6/2015	0.00	100.00	98.12	94.34	77.94	32.21

Source: US Drought Monitor

Cal DWR says the following about drought:

> *One dry year does not normally constitute a drought in California. California's extensive system of water supply infrastructure—its reservoirs, groundwater basins, and inter-regional conveyance facilities—mitigates the effect of short-term dry periods for most water users. Defining when a drought begins is a function of drought impacts to water users. Hydrologic conditions constituting a drought for water users in one location may not constitute a drought for water users elsewhere, or for water users having a different water supply. Individual water suppliers may use criteria such as rainfall/runoff, amount of water in storage, or expected supply from a water wholesaler to define their water supply conditions.*

The drought issue in California is further compounded by water rights. Water is a commodity possessed under a variety of legal doctrines. The prioritization of water rights between uses including farming and federally protected fish habitats in California is part of this issue.

Drought impacts are wide-reaching and may be economic, environmental, and/or societal. The most significant impacts associated with drought in the planning area are those related to water intensive activities such as agriculture, wildfire protection, municipal usage, commerce, tourism, recreation, and

wildlife preservation. During a drought, allocations go down, which results in reduced water availability. Voluntary conservation measures are typically implemented during extended droughts. A reduction of electric power generation and water quality deterioration are also potential problems. Drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding.

Drought can have secondary impacts. For example, drought is a major determinant of wildfire hazard, in that it creates greater propensity for fire starts and larger, more prolonged conflagrations fueled by excessively dry vegetation, along with reduced water supply for firefighting purposes. Drought is also an economic hazard. Significant economic impacts on California's agriculture industry can occur as a result of short- and long-term drought conditions; these include hardships to farmers, farm workers, packers, and shippers of agricultural products. In some cases, droughts can also cause significant increases in food prices to the consumer due to shortages. Drought can also result in lack of water and subsequent feed available to grazing livestock, potentially leading to risk of livestock death and resulting in losses to the State's and Calaveras County's agricultural economy.

Past Occurrences

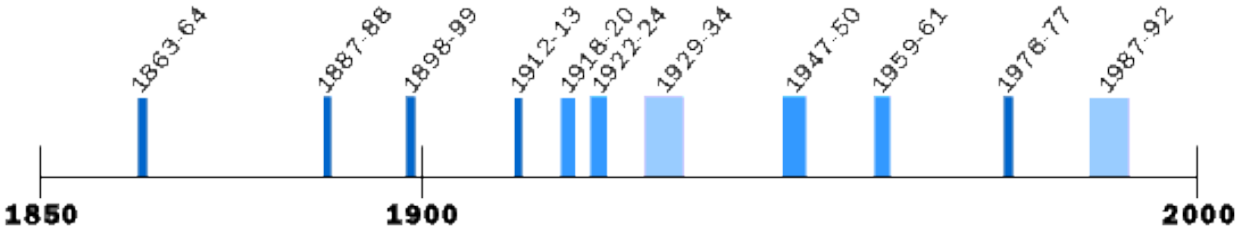
Historically, California has experienced multiple severe droughts. According to the DWR, droughts exceeding three years are relatively rare in Northern California, the source of much of the State's developed water supply. The 1929-34 drought established the criteria commonly used in designing storage capacity and yield of large northern California reservoirs. Table 4-19 compares the 1929-34 drought in the Sacramento and San Joaquin Valleys to the 1976-77, 1987-92, and 2007-09 droughts. The driest single year of California's measured hydrologic record was 1977. Table 4-20 depicts California's Multi-Year Historical Dry Periods, 1850-2000.

Table 4-19 Severity of Extreme Droughts in the Sacramento and San Joaquin Valleys

Drought Period	Sacramento Valley Runoff		San Joaquin Valley Runoff	
	(maf*/yr)	(percent Average 1901-96)	(maf*/yr)	(percent Average 1906-96)
1929-34	9.8	55	3.3	57
1976-77	6.6	37	1.5	26
1987-92	10.0	56	2.8	47
2007-09	11.2	64	3.7	3.

Source: California's Drought of 2007-2009, An Overview. State of California Natural Resources Agency, California Department of Water Resources. Available at: http://www.water.ca.gov/drought/docs/DroughtReport2010.pdf
*maf=million acre feet

Figure 4-21 California's Multi-Year Historical Dry Periods, 1850-2000

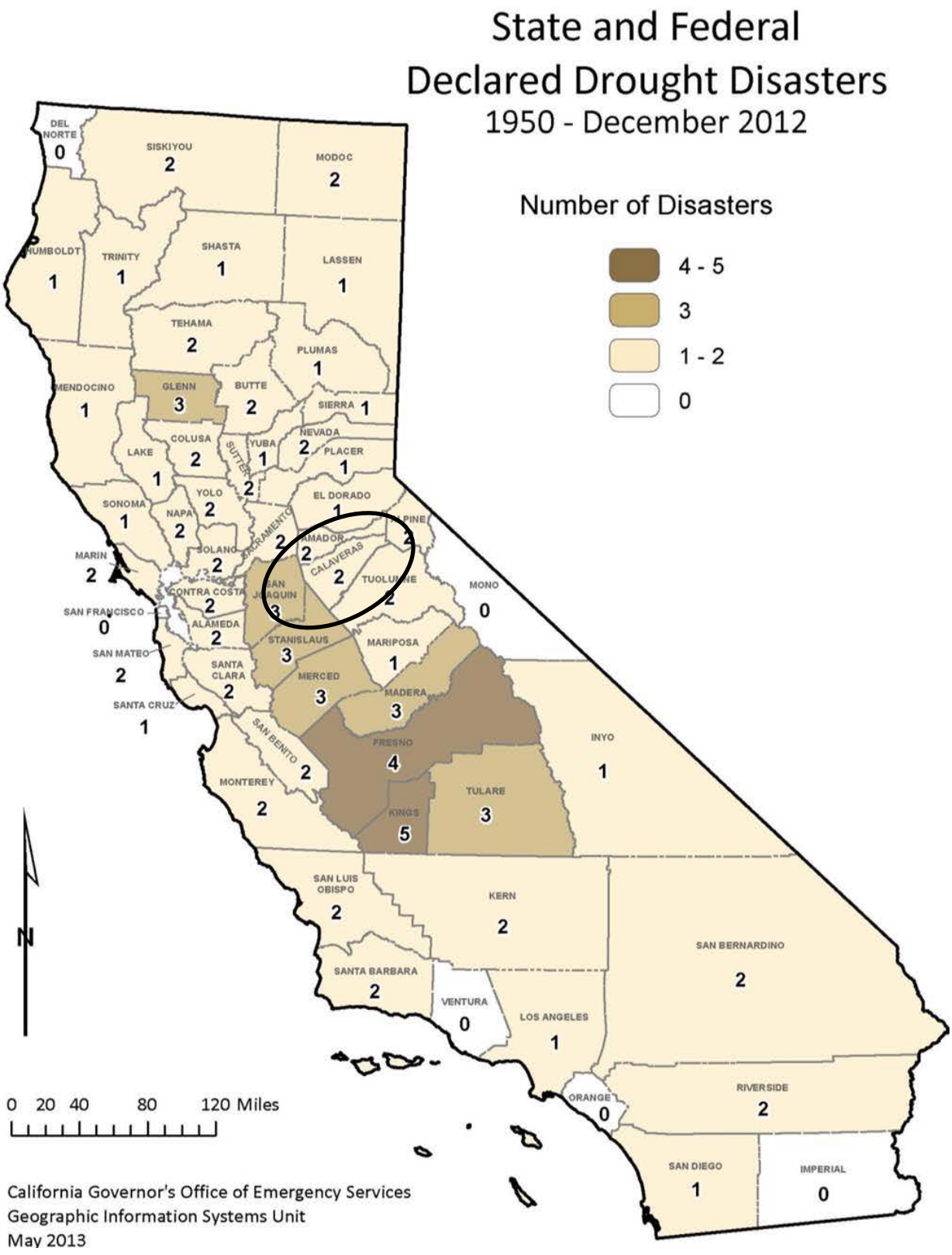


Source: California Department of Water Resources, www.water.ca.gov/

Notes: Dry periods prior to 1900 estimated from limited data; covers dry periods of statewide or major regional extent

According to the 2013 State of California Hazard Mitigation Plan, Calaveras County has experienced two droughts that resulted in a state disaster declaration. This can be seen in Figure 4-22.

Figure 4-22 Calaveras County Drought Declarations from 1950 to 2012



Since the 2013 State Plan, a drought emergency for the State of California was issued by Governor Brown. On January 17, 2014 the governor declared a State of Emergency for drought throughout California. This declaration came on the heels of a report that stated that California had the least amount of rainfall in its 163 year history. Californians were asked to voluntarily reduce their water consumption by 20 percent. The declaration also:

- Directed state agencies, led by Cal DWR, to execute a statewide campaign to encourage and promote water conservation, with a goal of reducing water usage by 20 percent.
- Required the Department of Forestry and Fire Protection to hire additional seasonal firefighters.
- Urged cities and water districts to update their water management and drought plans.
- Ordered all state agencies to conserve water, including placing a moratorium on new, nonessential landscaping at public buildings and along highways.
- Required state officials to speed approval for voluntary water sales and transfers between willing districts.
- Ordered Cal DWR to accelerate spending on water supply and conservation projects that can break ground this year.

Drought conditions worsened through 2014 and into 2015. On April 1, 2015, following the lowest snowpack ever recorded, Governor Brown announced actions that will save water, increase enforcement to prevent wasteful water use, streamline the State's drought response, and invest in new technologies that will make California more drought resilient. The governor directed the State Water Resources Control Board to implement mandatory water reductions in cities and towns across California to reduce water usage by 25 percent. This savings amounts to approximately 1.5 million acre-feet of water through the end of 2015. To save more water now, the order also sought to:

- Replace 50 million square feet of lawns throughout the state with drought tolerant landscaping in partnership with local governments;
- Direct the creation of a temporary, statewide consumer rebate program to replace old appliances with more water and energy efficient models;
- Require campuses, golf courses, cemeteries and other large landscapes to make significant cuts in water use; and
- Prohibit new homes and developments from irrigating with potable water unless water-efficient drip irrigation systems are used, and ban watering of ornamental grass on public street medians.

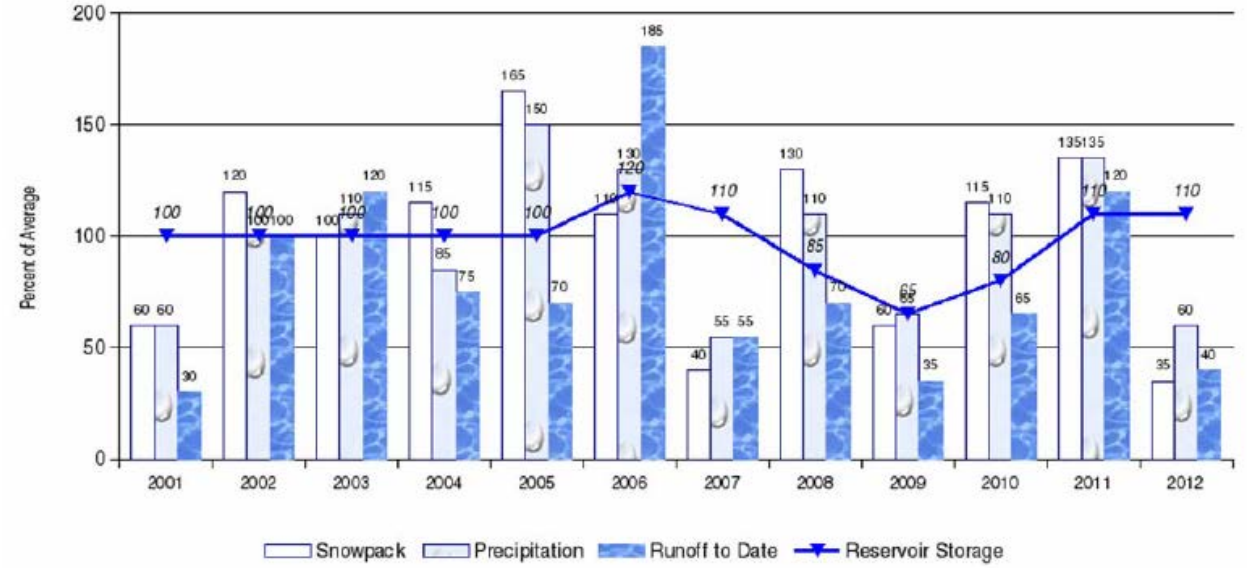
According to the HMPC, the County participates in Stage 3 water emergency protocols. Irrigation districts have but back to 1/3 of the use. UPUD has in place a water reduction plan that goes above and beyond the restriction requirements. This also creates the issue of reduced revenues due to use limitations.

Water Shortage

Figure 4-23, from the 2013 State of California Hazard Mitigation Plan, illustrates several indicators commonly used to evaluate water conditions in California. The percent of average values are determined by measurements made in each of the ten major hydrologic regions. The chart describes water conditions in California between 1996 and 2007. The chart illustrates the cyclical nature of weather patterns in

California. Snow pack and precipitation increased between 1996 and 1997, began decreasing in 1998, and began to show signs of recovery in 2002, increased in 2005, and decreased sharply in 2007.

Figure 4-23 Water Supply Conditions, 1996 to 2012



Source: 2013 State of California Hazard Mitigation Plan

Since 2012, snowpack levels in California have dropped dramatically. 2015 estimates place snowpack as 5 percent of normal levels. Snowpack measurements have been kept in California since 1950 and nothing in the historic record comes close 2015's severely depleted level. The previous record for the lowest snowpack level in California, 25 percent of normal, was set both in 1976-77 and 2013-2014. In "normal" years, the snowpack supplies about 30 percent of California's water needs, according to Cal DWR.

With a reduction in water, water supply issues base on water rights becomes more evident. Some agricultural uses, such as grapes and walnuts, are severely impacted through limited water supply.

Drought and water supply issues will continue to be a concern to the planning area. Irrigation of agricultural lands continues to be a concern in the planning area. City Title 22 allows for reclaimed water to be applied to vineyards and other agriculture areas; however, transporting reclaimed water from a facility to a field is challenging and can be expensive.

Likelihood of Future Occurrences

Drought

Likely—Historical drought data for Calaveras County indicate there have been 5 significant droughts in the last 86 years. This equates to a drought every 17.2 years on average or a 5.8 percent chance of a drought in any given year.

Water Shortage

Likely— Recent historical data for water shortage indicates that Calaveras County is at risk to both short and prolonged periods of water shortage. Based on this it is likely that water shortages will affect the County.

Climate Change and Drought

Climate scientists studying California find that drought conditions are likely to become more frequent and persistent over the 21st century due to climate change. The experiences of California during recent years underscore the need to examine more closely the state's water storage, distribution, management, conservation, and use policies. The CAS stresses the need for public policy development addressing long term climate change impacts on water supplies. The CAS notes that climate change is likely to significantly diminish California's future water supply, stating that:

> *California must change its water management and uses because climate change will likely create greater competition for limited water supplies needed by the environment, agriculture, and cities.*

The regional implications of declining water supplies as a long-term public policy issue are recognized in a Southern California Association of Governments July 2009 publication of essays examining climate change topics. In one essay, Dan Cayan observes:

> *In one form or another, many of Southern California's climate concerns radiate from efforts to secure an adequate fresh water supply…Of all the areas of North America, Southern California's annual receipt of precipitation is the most volatile – we only occasionally see a "normal" year, and in the last few we have swung from very wet in 2005 to very dry in 2007 and 2008….Southern California has special challenges because it is the most urban of the California water user regions and, regionwide, we import more than two-thirds of the water that we consume.*

4.2.10. Earthquake

Hazard/Problem Description

According to the California Geological Survey, an earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up, and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. The amount of energy released during an earthquake is usually expressed as a magnitude and is measured directly from the earthquake as recorded on seismographs. An earthquake's magnitude is expressed in whole numbers and decimals (e.g., 6.8). Seismologists have developed several magnitude scales. One of the first was the Richter Scale, developed in 1932 by the late Dr. Charles F. Richter of the California Institute of Technology. The Richter Magnitude Scale is used to quantify the magnitude or strength of the seismic energy released by an earthquake. Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface (see Table 4-20). Seismic shaking is typically the greatest cause of losses to structures during earthquakes.

Table 4-20 Modified Mercalli Intensity (MMI) Scale

MMI	Felt Intensity
I	Not felt except by a very few people under special conditions. Detected mostly by instruments.
II	Felt by a few people, especially those on upper floors of buildings. Suspended objects may swing.
III	Felt noticeably indoors. Standing automobiles may rock slightly.
IV	Felt by many people indoors; by a few outdoors. At night, some people are awakened. Dishes, windows, and doors rattle.
V	Felt by nearly everyone. Many people are awakened. Some dishes and windows are broken. Unstable objects are overturned.
VI	Felt by everyone. Many people become frightened and run outdoors. Some heavy furniture is moved. Some plaster falls.
VII	Most people are alarmed and run outside. Damage is negligible in buildings of good construction, considerable in buildings of poor construction.
VIII	Damage is slight in specially designed structures, considerable in ordinary buildings, and great in poorly built structures. Heavy furniture is overturned.
IX	Damage is considerable in specially designed buildings. Buildings shift from their foundations and partly collapse. Underground pipes are broken.
X	Some well-built wooden structures are destroyed. Most masonry structures are destroyed. The ground is badly cracked. Considerable landslides occur on steep slopes.
XI	Few, if any, masonry structures remain standing. Rails are bent. Broad fissures appear in the ground.
XII	Virtually total destruction. Waves are seen on the ground surface. Objects are thrown in the air.

Source: Multi-Hazard Identification and Risk Assessment, FEMA 1997

California is seismically active because it sits on the boundary between two of the earth's tectonic plates. Most of the state - everything east of the San Andreas Fault - is on the North American Plate. The cities of Monterey, Santa Barbara, Los Angeles, and San Diego are on the Pacific Plate, which is constantly moving northwest past the North American Plate. The relative rate of movement is about two inches per year. The San Andreas Fault is considered the boundary between the two plates, although some of the motion is taken up on faults as far away as central Utah.

Earthquake Hazards

Earthquakes can cause structural damage, injury, and loss of life, as well as damage to infrastructure networks, such as water, power, gas, communication, and transportation. Earthquakes may also cause collateral emergencies including dam and levee failures, seiches, hazmat incidents, fires, avalanches, and landslides. The degree of damage depends on many interrelated factors. Among these are: the magnitude, focal depth, distance from the causative fault, source mechanism, duration of shaking, high rock accelerations, type of surface deposits or bedrock, degree of consolidation of surface deposits, presence of high groundwater, topography, and the design, type, and quality of building construction. This section briefly discusses issues related to types of seismic hazards.

Ground Shaking

Groundshaking is motion that occurs as a result of energy released during faulting. The damage or collapse of buildings and other structures caused by groundshaking is among the most serious seismic hazards. Damage to structures from this vibration, or groundshaking, is caused by the transmission of earthquake vibrations from the ground to the structure. The intensity of shaking and its potential impact on buildings is determined by the physical characteristics of the underlying soil and rock, building materials and workmanship, earthquake magnitude and location of epicenter, and the character and duration of ground motion. Much of the County is located on alluvium which increases the amplitude of the earthquake wave. Ground motion lasts longer and waves are amplified on loose, water-saturated materials than on solid rock. As a result, structures located on alluvium typically suffer greater damage than those located on solid rock.

Seismic Structural Safety

Older buildings constructed before building codes were established, and even newer buildings constructed before earthquake-resistance provisions were included in the codes, are the most likely to be damaged during an earthquake. Buildings one or two stories high of wood-frame construction are considered to be the most structurally resistant to earthquake damage. Older masonry buildings without seismic reinforcement (unreinforced masonry) are the most susceptible to the type of structural failure that causes injury or death.

The susceptibility of a structure to damage from ground shaking is also related to the underlying foundation material. A foundation of rock or very firm material can intensify short-period motions which affect low-rise buildings more than tall, flexible ones. A deep layer of water-logged soft alluvium can cushion low-rise buildings, but it can also accentuate the motion in tall buildings. The amplified motion resulting from softer alluvial soils can also severely damage older masonry buildings.

Other potentially dangerous conditions include, but are not limited to: building architectural features that are not firmly anchored, such as parapets and cornices; roadways, including column and pile bents and abutments for bridges and overcrossings; and above-ground storage tanks and their mounting devices. Such features could be damaged or destroyed during strong or sustained ground shaking.

Liquefaction Potential

Liquefaction is a process whereby soil is temporarily transformed to a fluid form during intense and prolonged ground shaking. Areas most prone to liquefaction are those that are water saturated (e.g., where the water table is less than 30 feet below the surface) and consist of relatively uniform sands that are loose to medium density. In addition to necessary soil conditions, the ground acceleration and duration of the earthquake must be of sufficient energy to induce liquefaction.

Liquefaction during major earthquakes has caused severe damage to structures on level ground as a result of settling, titling, or floating. Such damage occurred in San Francisco on bay-filled areas during the 1989 Loma Prieta earthquake, even though the epicenter was several miles away. If liquefaction occurs in or under a sloping soil mass, the entire mass may flow toward a lower elevation. Also of particular concern in terms of developed and newly developing areas are fill areas that have been poorly compacted.

Settlement

Settlement can occur in poorly consolidated soils during ground shaking. During settlement, the soil materials are physically rearranged by the shaking to result in a less stable alignment of the individual minerals. Settlement of sufficient magnitude to cause significant structural damage is normally associated with rapidly deposited alluvial soils or improperly founded or poorly compacted fill. These areas are known to undergo extensive settling with the addition of irrigation water, but evidence due to ground shaking is not available.

Other Hazards

Earthquakes can also cause seiches, landslides, and dam failures. A seiche is a periodic oscillation of a body of water resulting from seismic shaking or other factors that could cause flooding. Earthquakes may cause landslides (discussed in Section 4.2.12), particularly during the wet season, in areas of high water or saturated soils. Finally, earthquakes can cause dams to fail (see Section 4.2.6 Dam Failure).

Faults

A fault is defined as "a fracture or fracture zone in the earth's crust along which there has been displacement of the sides relative to one another." For the purpose of planning there are two types of faults, active and inactive. Active faults have experienced displacement in historic time, suggesting that future displacement may be expected. Inactive faults show no evidence of movement in recent geologic time, suggesting that these faults are dormant.

Two types of fault movement represent possible hazards to structures in the immediate vicinity of the fault: fault creep and sudden fault displacement. Fault creep, a slow movement of one side of a fault relative to the other, can cause cracking and buckling of sidewalks and foundations even without perceptible ground shaking. Sudden fault displacement occurs during an earthquake event and may result in the collapse of buildings or other structures that are found along the fault zone when fault displacement exceeds an inch or two. The only protection against damage caused directly by fault displacement is to prohibit construction in the fault zone.

According to the General Plan Safety Element, Calaveras County is in the Sierra Block, an area of historically low seismic activity that is within Seismic Risk Zone 3 and roughly 100 miles east of the seismically active San Francisco Bay area. The County is not in, adjacent to, or crossed by, an Alquist-Priolo Earthquake Fault Zone. The County's potentially active faults include the Bear Mountain and Melones Fault Zones, part of the Foothills Fault System, which pass through the western County near Valley Springs, Mokelumne Hill and south of Copperopolis. More distant is the Sierra Frontal Fault System along the eastern edge of the Sierra Nevada Range with a low likelihood of generating seismic activity in the County.

Potential active faults in the Valley Springs/Mokelumne Hill area are the following:

- Youngs Creek
- Waters Peak
- Poorman Gulch

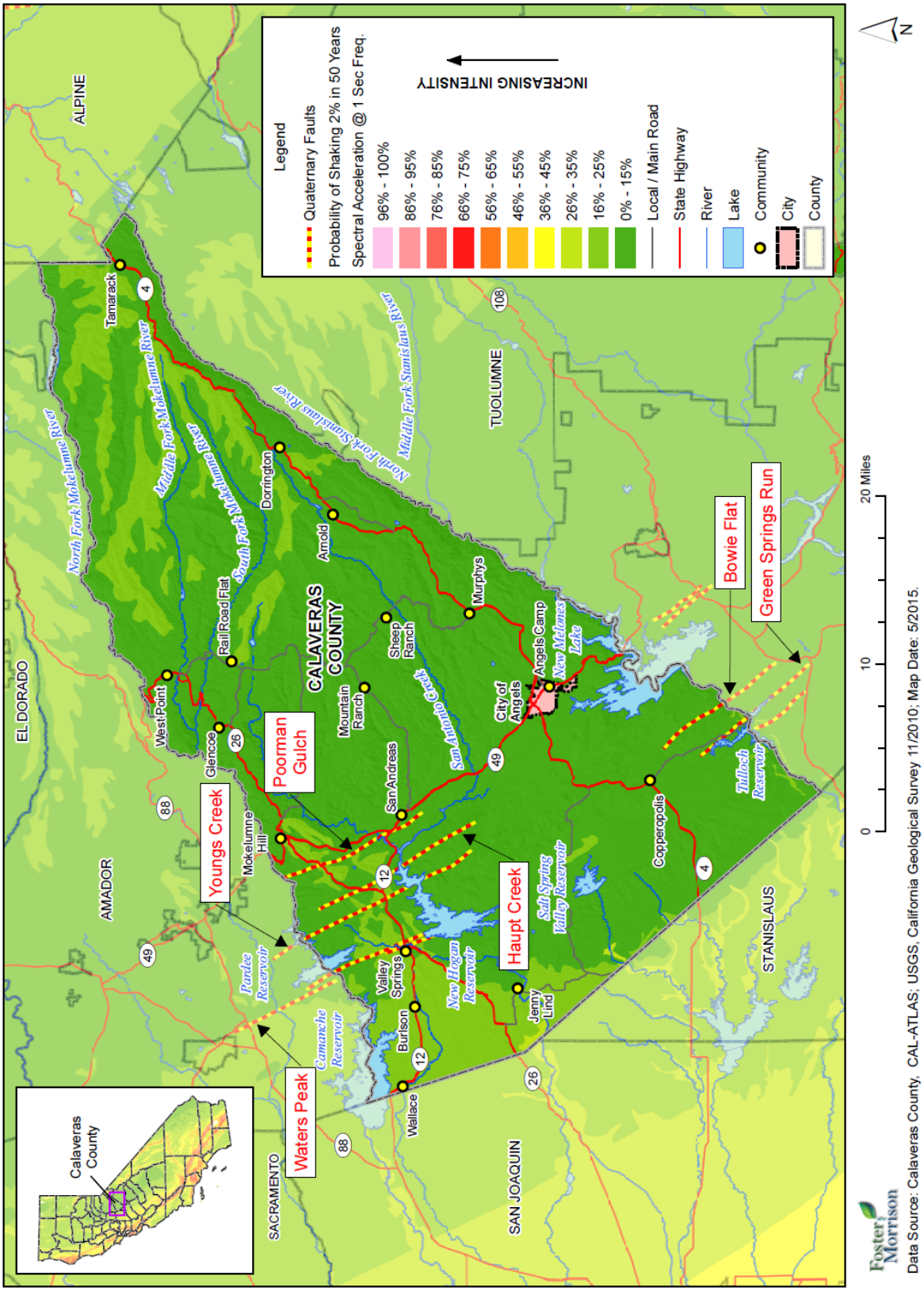
- Haupt Creek

Potentially active faults in the Copperopolis area are the following:

- Bowie Flat
- Green Springs Run
- Rawhide Flat East
- Rawhide Flat West

Figure 4-24 below shows the location of faults in or near the County and groundshaking potential based on data from the California Geological Survey.

Figure 4-24 Groundshaking and Active Faults in the County



The Emergency Operations Plan (EOP) noted that there are faults that do not traverse the County that may cause shaking effects to occur inside the County. The following is a breakdown of where these faults are located and what kind of hazardous potential they may present to Calaveras County.

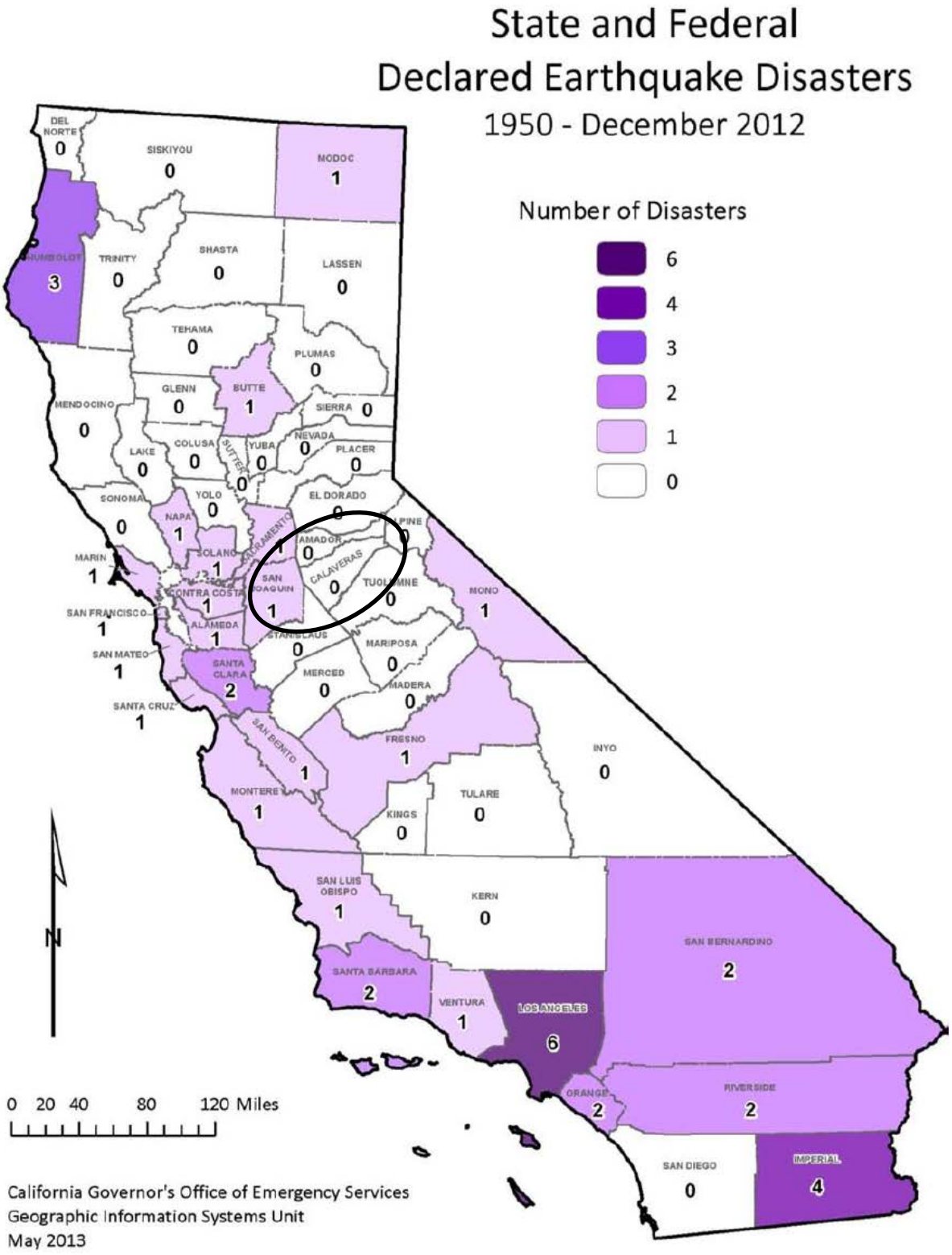
- The Ortigalita Fault, which has been zoned by the State Geologist under the Alquist-Priolo Earthquake Fault Zoning Act, is located in the western portion of Merced County, approximately 13 miles west of Los Banos. The maximum earthquake magnitude measured with the magnitude (Mw) scale on this fault was 7.9 Mw.
- The Central Valley Coast Range Blind Thrust Fault is located parallel to Interstate-5 along the topographic break in slope between the Diablo Range and the San Joaquin Valley. This fault system is seismogenically active, but is not completely mappable at the surface. It increases the design earthquake ground motion for Gustine, Santa Nella, and Los Banos. This fault is the cause of the 1983 Coalinga Earthquake. The maximum earthquake magnitude measured on this fault was 6.8 Mw.
- The Calaveras Fault is an active fault located in the vicinity of Hollister. It is 16 miles west of Pacheco Pass and it lies outside of Merced County. The maximum earthquake magnitude measured on this fault was 6.2 Mw.
- The Greenville Fault is another fault outside of Merced County. It lies approximately 30 miles northwest of Pacheco Pass. This active fault crosses near Livermore and has a maximum earthquake magnitude measurement of 6.9 Mw.
- The San Andreas Fault is the largest and most active fault in California and is located about 24 miles west of Pacheco Pass. Earthquakes on this fault will be the source of long duration but distant ground motion felt within Calaveras County. The maximum earthquake magnitude measured on this fault was a 7.9 Mw.
- The Bear Mountain Fault is also near Merced County. This fault zone is located about 10 miles east of the Merced County line and about 30 miles from Calaveras County along the foothills of the Sierra Nevada. This fault is not an active fault and is not modeled as seismogenically active for purposes of regional earthquake ground motion.

While there is no record of any seismic activity originating in the County, the County has been shaken by earthquakes originating elsewhere. The County of Calaveras has been very fortunate in the past that is it has not suffered any substantial damage or loss of life from earthquakes. The possibility of future earthquakes of equal or greater magnitude than those from previous years could cause a great many casualties and extensive property damage in the County. This could be aggravated by aftershocks and by secondary effects of fire, landslides, and dam failures.

Past Occurrences

According to Cal OES, there has never been a state disaster declaration (Figure 4-25) for an earthquake in Calaveras County or in any of the surrounding counties, and there is no record of damaging earthquakes. However, the Calaveras County Draft General Plan does note that ground shaking has been felt in the past, notably during the Mono Lake earthquake in October 1990.

Figure 4-25 Calaveras County Earthquake Declarations from 1950 to 2012



Source: Cal OES

In addition, the USGS Earthquake Database contains data on earthquakes in the Calaveras County area. Table 4-21 shows the approximate distances earthquakes can be felt away from the epicenter. According to the table, a magnitude 5.0 earthquake could be felt up to 90 miles away. The USGS database was searched for magnitude 5.0 or greater on the Richter Scale within 90 miles of the City of Angels Camp in Calaveras County. These results are shown in Table 4-22. No specific damage reports within the County were available.

Table 4-21 Approximate Relationships between Earthquake Magnitude and Intensity

Richter Scale Magnitude	Maximum Expected Intensity (MM)*	Distance Felt (miles)
2.0 - 2.9	I – II	0
3.0 - 3.9	II – III	10
4.0 - 4.9	IV – V	50
5.0 - 5.9	VI – VII	90
6.0 - 6.9	VII – VIII	135
7.0 - 7.9	IX – X	240
8.0 - 8.9	XI – XII	365

*Modified Mercalli Intensity Scale.
Source: United States Geologic Survey, Earthquake Intensity Zonation and Quaternary Deposits, Miscellaneous Field Studies Map 9093, 1977.

*Table 4-22 Magnitude 5.0 Earthquakes within 90 Miles of Calaveras County**

Date	Magnitude	Distance from Calaveras County
9/4/1978	5.2	62 miles
8/6/1979	5.7	78 miles
10/7/1979	5.2	63 miles
1/24/1980	5.8	68 miles
1/27/1980	5.8	67 miles
11/28/1980	5.2	82 miles
1/7/1983	5.4	88 miles
4/24/1984	6.2	79 miles
1/241985	5.3	90 miles
3/311986	5.7	72 miles
6/13/1988	5.4	79 miles
10/24/1990	5.7	72 miles
1/16/1993	5.3	84 miles
9/12/1994	6.1	68 miles
9/12/1994	5.4	60 miles
12/22/1995	5.2	69 miles
12/23/1995	5.2	71 miles
12/28/1995	5.5	70 miles

Date	Magnitude	Distance from Calaveras County
10/31/2007	5.6	78 miles

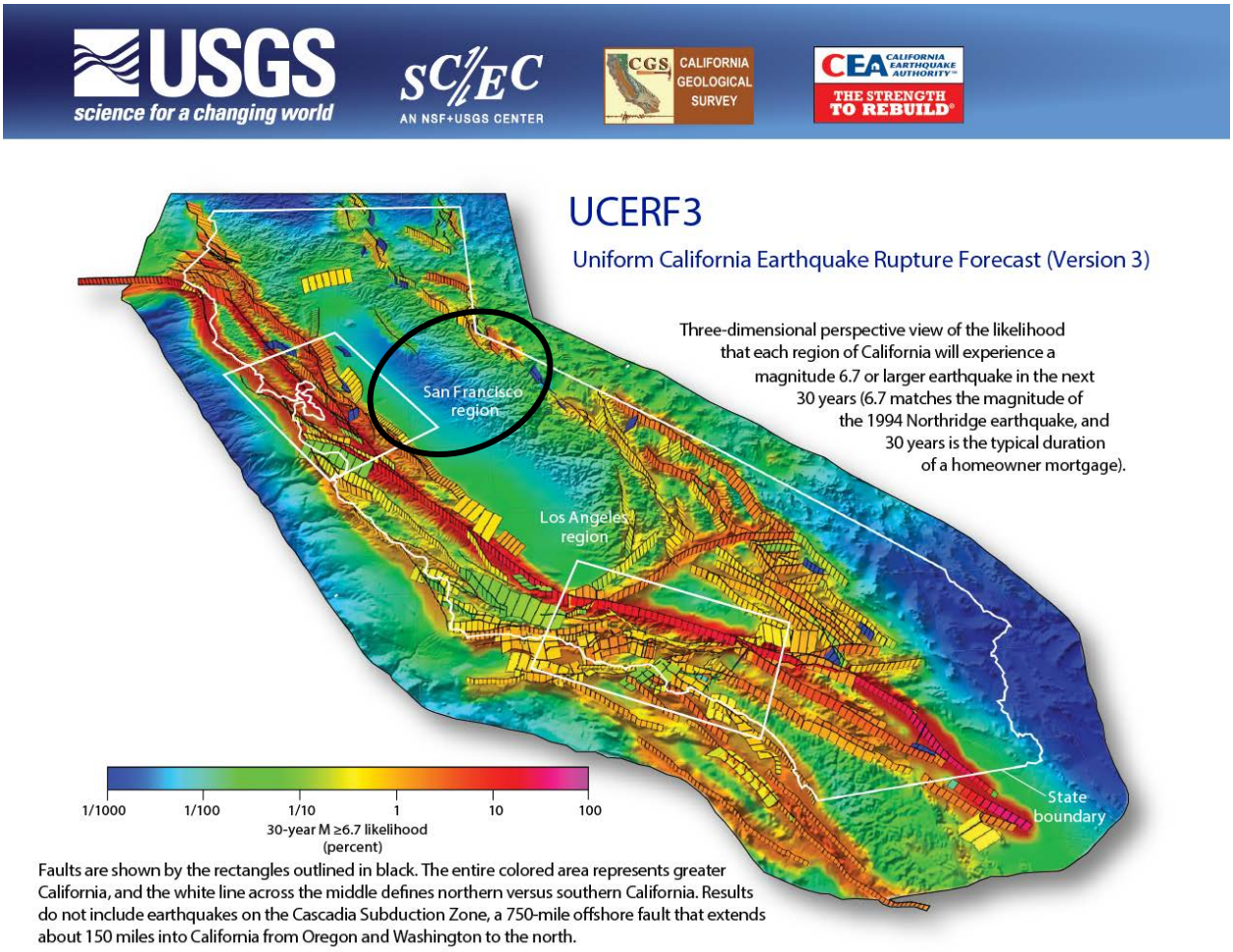
Source: USGS
*Search dates 1973- March 1, 2015

Likelihood of Future Occurrences

Occasional/Unlikely– The State of California Multi-Hazard Mitigation Plan ranks the earthquake hazard for the majority of Calaveras County at its lowest earthquake risk. The California Geological Survey's probabilistic seismic assessment for Calaveras County estimates that peak ground acceleration could reach or exceed 0.1 to 0.2 g (intensity value I on the Modified Mercalli Intensity Scale, see Table 4-20) with a 0.21 percent chance of being exceeded each year. Thus, based on patterns of previous occurrences, probability of ground shaking is occasional, with a 1-10 percent chance of occurrence in the next year. The probability of a large, damaging earthquake is unlikely, with less than a 1 percent chance of occurrence in next 100 years. In sum, the likelihood of future occurrence of minor earthquakes is occasional, and the likelihood of future occurrence of major earthquake is unlikely.

In 2014, the United States Geological Survey (USGS) and the California Geological Survey (CGS) released the time-dependent version of the Uniform California Earthquake Rupture Forecast (UCERF III) model. The UCERF III results have helped to reduce the uncertainty in estimated 30-year probabilities of strong ground motions in California. The UCERF map is shown in Figure 4-26 and indicates that Calaveras County has a low to moderate risk of earthquake occurrence, which coincides with the likelihood of future occurrence rating of occasional to unlikely.

Figure 4-26 Probability of Earthquake Magnitudes Occurring in 30 Year Time Frame



Source: United States Geological Survey Open File Report 2015-3009

Climate Change and Earthquake

Climate change is unlikely to impact the occurrences of earthquake.

4.2.11. Flood: 100-/500-year and Flood: Localized Stormwater Flooding

Hazard/Problem Description

According to Cal DWR, flooding is the rising and overflowing of a body of water onto normally dry land. Floods are among the most costly natural disasters in terms of human hardship and economic loss nationwide. Floods can cause substantial damage to structures, landscapes, and utilities as well as life safety issues. Floods can be extremely dangerous, and even six inches of moving water can knock over a person given a strong current. A car will float in less than two feet of moving water and can be swept downstream into deeper waters. This is one reason floods kill more people trapped in vehicles than anywhere else. During a flood, people can also suffer heart attacks or electrocution due to electrical equipment short outs. Floodwaters can transport large objects downstream which can damage or remove stationary structures. Ground saturation can result in instability, collapse, or other damage. Objects can also be buried or

destroyed through sediment deposition. Floodwaters can also break utilities lines and interrupt services. Standing water can cause damage to crops, road, foundations, and electrical circuits. Direct impacts, such as drowning, can be limited with adequate warning and public education about what to do during floods. Where flooding occurs in populated areas, warning and evacuation will be of critical importance to reduce life and safety impacts from any type of flooding.

Health Hazards from Flooding

According to FEMA, certain health hazards are also common to flood events. While such problems are often not reported, three general types of health hazards accompany floods. The first comes from the water itself. Floodwaters carry anything that was on the ground that the upstream runoff picked up, including dirt, oil, animal waste, and lawn, farm and industrial chemicals. Pastures and areas where cattle and hogs are kept or their wastes are stored can contribute polluted waters to the receiving streams.

Floodwaters also saturate the ground, which leads to infiltration into sanitary sewer lines. When wastewater treatment plants are flooded, there is nowhere for the sewage to flow. Infiltration and lack of treatment can lead to overloaded sewer lines that can back up into low-lying areas and homes. Even when it is diluted by flood waters, raw sewage can be a breeding ground for bacteria such as e. coli and other disease causing agents.

The second type of health problem arises after most of the water has gone. Stagnant pools can become breeding grounds for mosquitoes, and wet areas of a building that have not been properly cleaned breed mold and mildew. A building that is not thoroughly cleaned becomes a health hazard, especially for small children and the elderly.

Another health hazard occurs when heating ducts in a forced air system are not properly cleaned after inundation. When the furnace or air conditioner is turned on, the sediments left in the ducts are circulated throughout the building and breathed in by the occupants. If a water system loses pressure, a boil order may be issued to protect people and animals from contaminated water.

The third problem is the long-term psychological impact of having been through a flood and seeing one's home damaged and irreplaceable keepsakes destroyed. The cost and labor needed to repair a flood-damaged home puts a severe strain on people, especially the unprepared and uninsured. There is also a long-term problem for those who know that their homes can be flooded again. The resulting stress on floodplain residents takes its toll in the form of aggravated physical and mental health problems.

100-/500-year Flood

The area adjacent to a river channel is the floodplain. Floodplains are illustrated on inundation maps, which show areas of potential flooding and water depths. In its common usage, the floodplain most often refers to that area that is inundated by the 100-year flood, the flood that has a one percent chance in any given year of being equaled or exceeded. The 100-year flood is the national minimum standard to which communities regulate their floodplains through the National Flood Insurance Program (NFIP).

There are three types of flood events in the Calaveras County area: riverine, flash, and urban stormwater. Regardless of the type of flood, the cause is often the result of severe weather and excessive rainfall, either in the flood area or upstream reaches.

- **Riverine flooding** is the most common type of flood event and occurs when a watercourse exceeds its "bank-full" capacity. Riverine flooding generally occurs as a result of prolonged rainfall, or rainfall that is combined with already saturated soils from previous rain events. The duration of riverine floods may vary from a few hours to many days. Factors that directly affect the amount of flood runoff include precipitation amount, intensity and distribution, the amount of soil moisture, seasonal variation in vegetation, snow depth, and water-resistance of the surface due to urbanization. The warning time associated with slow rise floods assists in life and property protection.
- The term "**flash flood**" describes localized floods of great volume and short duration. In contrast to riverine flooding, this type of flood usually results from a heavy rainfall on a relatively small drainage area. Precipitation of this sort usually occurs in the winter and spring. Flash floods often require immediate evacuation within the hour.
- **Stormwater/Urban flood** events have increased as land has been converted from fields or woodlands to roads and parking lots and lost its ability to absorb rainfall. Urbanization increases runoff by two to six times that of natural terrain.

Other types of floods include general rain floods, thunderstorm floods, snowmelt and rain on snow floods, dam failure floods, and local drainage floods. This last type of flooding is discussed in greater detail in the discussion of localized stormwater flooding below. Volume, onset, and duration characteristics for different types of floods are described below:

- **Snowmelt**—Flooding is characterized by moderate peak flows, large volume of runoff, moderate speed of onset, long duration, and marked daily fluctuation of flow.
- **Rain in a general storm system**—Flooding is characterized by high peak flows and moderate speed of onset and duration of flood flows.
- **Rain in a localized intense thunderstorm**—Flooding is characterized by high peak flows, relatively sudden onset, short duration of flow, and smaller volumes of runoff.

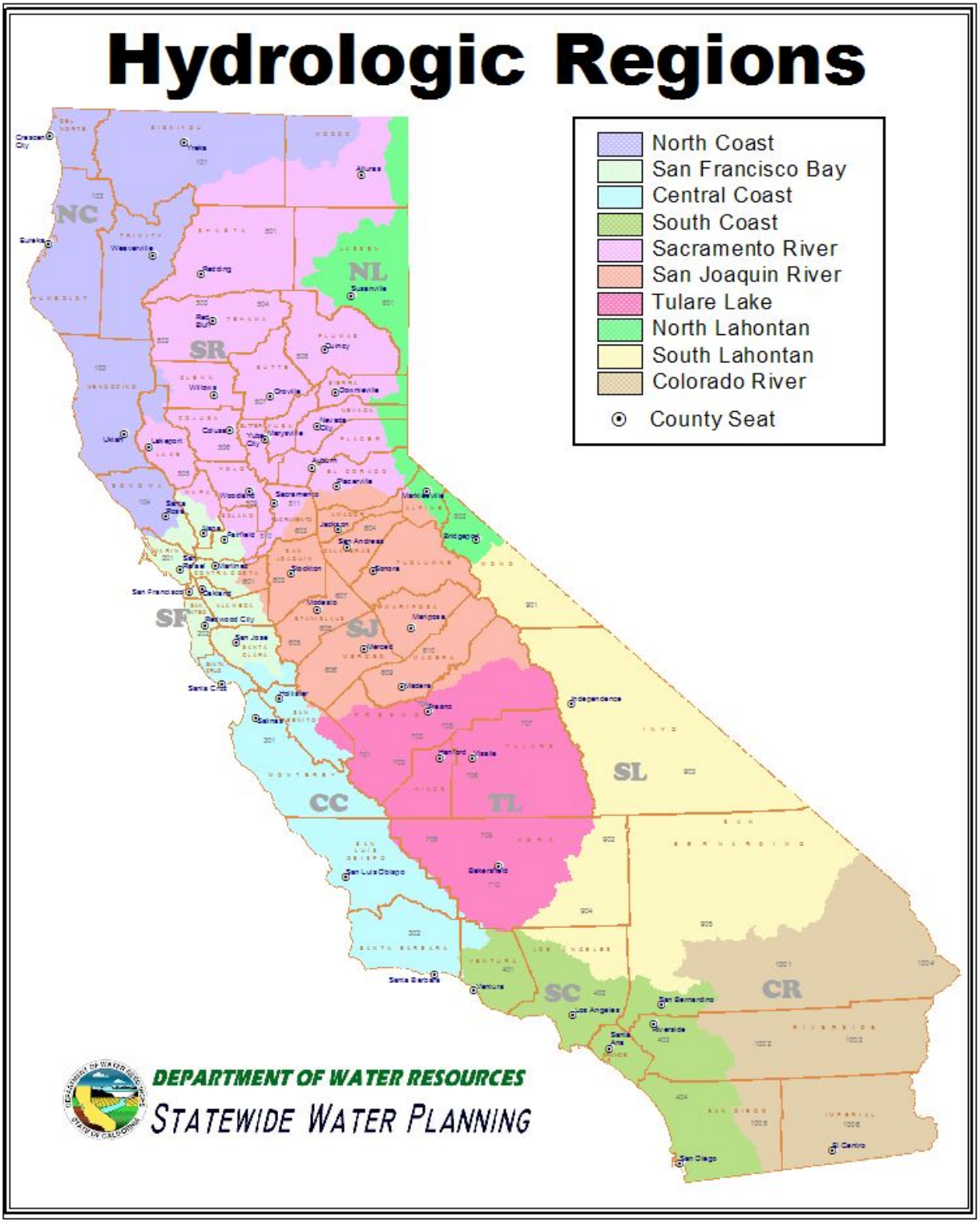
The potential for flooding can change and increase through various land use changes and changes to land surface, resulting in a change to the floodplain. Environmental changes can create localized flooding problems in and outside of natural floodplains by altering or confining natural drainage channels. These changes are most often created by human activity.

The EOP noted that the primary flood control concerns for Calaveras County involve controlled releases from Spicer and Hunter Reservoirs, McKay's Dam, Hogan, Melones and Tulloch Lakes, and rising water in the Mokelumne and Stanislaus Rivers, smaller year-around flowing creeks including the Angels, Murphys, Moran, and Cosgrove Creeks, and flash flood waters from numerous seasonal creek beds located throughout the County.

Major Sources of Flooding

According to Cal DWR, California is divided into 10 hydrologic regions, and Calaveras County is in the San Joaquin region, which encompasses the middle portion of the Central Valley bounded by the Sierra Nevada Mountains, the Coast Range, the divide between the American and Consumnes river watersheds, and the divide between the San Joaquin and Kings river watersheds. The region also includes portions of the Sacramento-San Joaquin Delta. Although predominantly agricultural, this region has experienced increased urbanization in recent years and is subject to flooding from winter storm events and snowmelt. A map of the California's hydrological regions is provided in Figure 4-27.

Figure 4-27 California Hydrologic Regions

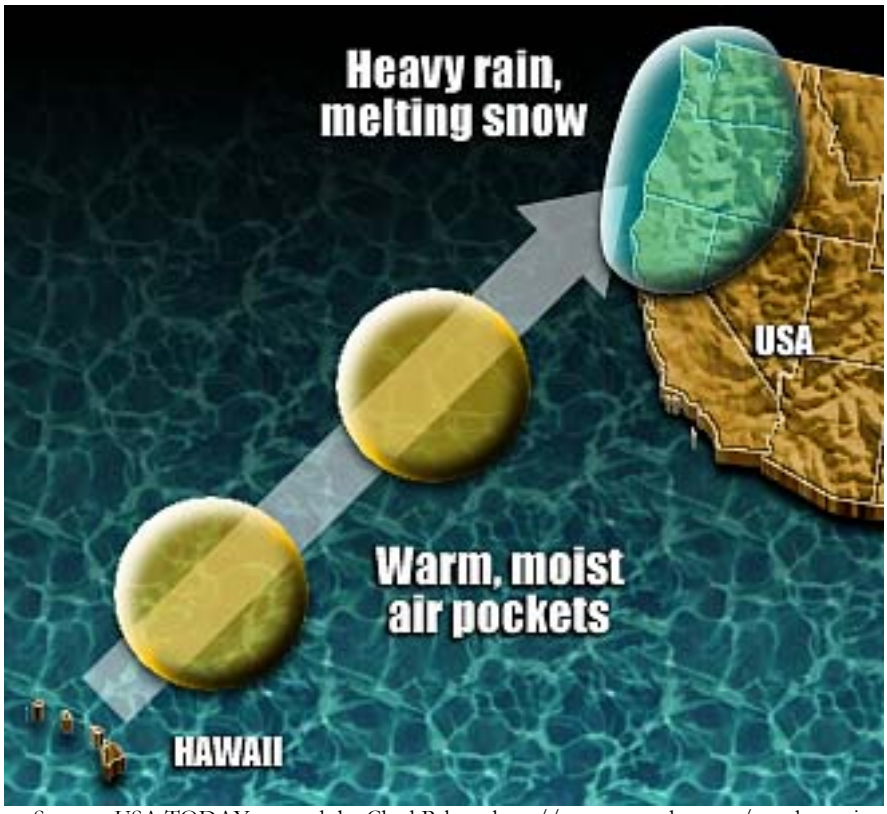


Source: California Department of Water Resources

Calaveras County encompasses multiple rivers, streams, creeks, and associated watersheds. The County is situated in a region that dramatically drops in elevation from the eastern portion (Sierra Nevada) to the western portion, where excess rain on snow can contribute to downstream flooding. Damaging floods in Calaveras County occur primarily in the developed areas of the county. Flood flows generally follow defined stream channels, drainages, and watersheds. A weather pattern called the "Pineapple Express" contributes to the flooding potential of the area.

Pineapple express brings warm air, rain to West. A relatively common weather pattern brings southwest winds to the Pacific Northwest or California, along with warm, moist air. The moisture sometimes produces many days of heavy rain, which can cause extensive flooding. The warm air also can melt the snow pack in the mountains, which further aggravates the flooding potential. In the colder parts of the year, the warm air can be cooled enough to produce heavy, upslope snow as it rises into the higher elevations of the Sierra Nevada or Cascades. Forecasters and others on the West Coast often refer to this warm, moist air as the "Pineapple Express" because it comes from around Hawaii where pineapples are grown. This is shown in Figure 4-28.

Figure 4-28 Pineapple Express Weather Pattern



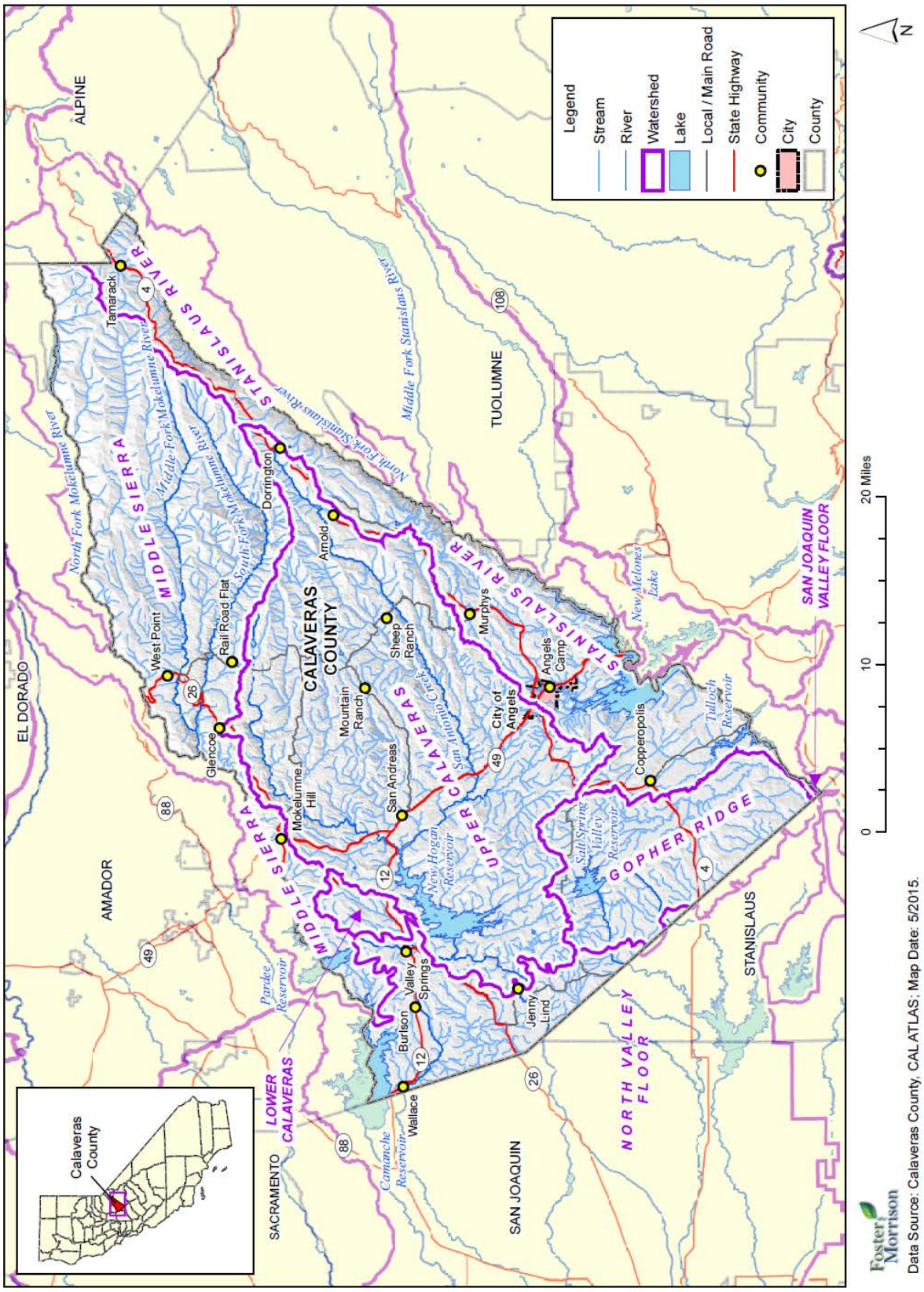
Source: USA TODAY research by Chad Palmer http://www.usatoday.com/weatherwpinappl.htm

Calaveras County Streams and Watersheds

According to mapping done by the California Department of Conservation, Calaveras County intersects many watersheds. There are numerous small creeks that are tributaries to the major waterways. Waterways and watersheds in the County are shown in Figure 4-29. The seven primary watersheds in the County are:

- North Valley Floor
- Middle Sierra
- Upper Calaveras
- Stanislaus River
- San Joaquin Valley Floor
- Gopher Ridge
- Lower Calaveras

Figure 4-29 Waterways and Watersheds in Calaveras County



Although predominantly agricultural, this region has experienced increased urbanization in recent years and is subject to flooding from winter storm events and snowmelt. The western quarter of Calaveras County contains the majority of the properties and facilities that could be impacted by flooding.

In Calaveras County, the Flood Insurance Study (FIS) reports that flooding may occur from heavy rainfall on saturated soils, rapid snowmelt, or a combination of these factors. Riverine flooding along the main channels of the Mokelumne and Stanislaus Rivers, mid-elevation tributaries of the Mokelumne, and the upper reaches of the Calaveras usually results from heavy snowmelt in combination with heavy rainfall. In the western portion of the county, the sources of flooding are heavy rainfall associated with repeated winter storms and a saturated soil mantle. Summer thunderstorms can also lead to flooding. Flooding sources that could affect the County are shown in Figure 4-29.

Floodplain Mapping

FEMA established standards for floodplain mapping studies as part of the National Flood Insurance Program (NFIP). The NFIP makes flood insurance available to property owners in participating communities adopting FEMA-approved local floodplain studies, maps, and regulations. Floodplain studies that may be approved by FEMA include federally funded studies; studies developed by state, city, and regional public agencies; and technical studies generated by private interests as part of property annexation and land development efforts. Such studies may include entire stream reaches or limited stream sections depending on the nature and scope of a study. A general overview of floodplain mapping and associated products is provided in the following paragraphs.

Flood Insurance Study (FIS)

The FIS develops flood-risk data for various areas of the community that will be used to establish flood insurance rates and to assist the community in its efforts to promote sound floodplain management. The current Calaveras County FISs are dated December 17, 2010.

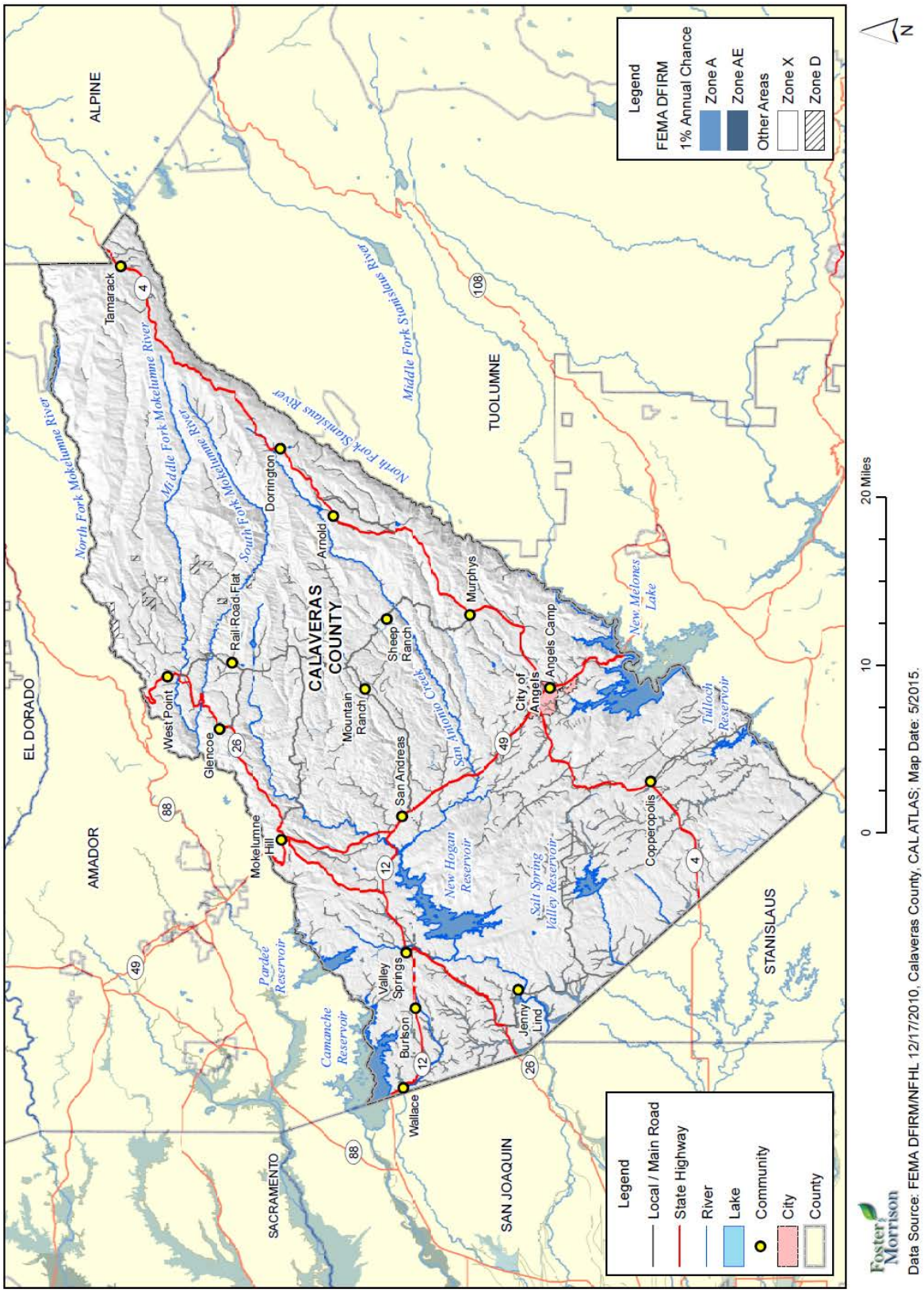
Digital Flood Insurance Rate Maps (DFIRM)

As part of its Map Modernization program, FEMA is converting paper FIRMS to digital FIRMs, DFIRMS. These digital maps:

- Incorporate the latest updates (LOMRs and LOMAs);
- Utilize community supplied data;
- Verify the currency of the floodplains and refit them to community supplied basemaps;
- Upgrade the FIRMs to a GIS database format to set the stage for future updates and to enable support for GIS analyses and other digital applications; and
- Solicit community participation.

DFIRMs for Calaveras County were released December 17, 2010 and are used for this plan's flood hazard analysis. This is shown in Figure 4-30.

Figure 4-30 Calaveras County DFIRM Flood Zones



According to the HMPC, the current flood maps do not incorporate recent map change (LOMRs). The County is working with FMEA to update the DFRIMs, which may include conducting additional stream studies and incorporate better map data such as new LIDAR.

Department of Water Resource (DWR) Floodplain Mapping

Also to be considered when evaluating the flood risks in Calaveras County are various floodplain maps developed by Cal DWR for various areas throughout California, including Calaveras County.

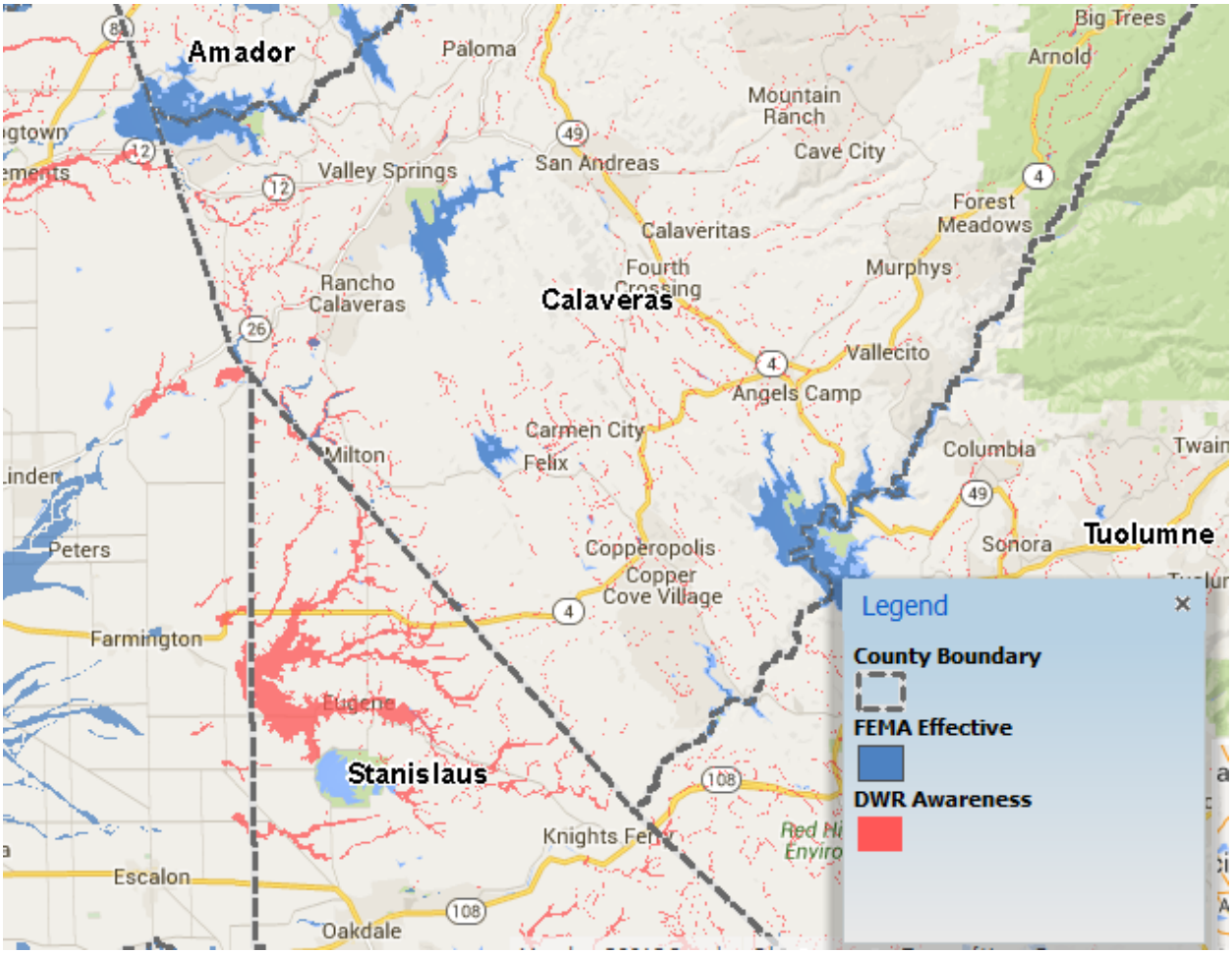
DWR Best Available Maps

The Best Available Maps were developed pursuant to Senate Bill 5 which requires DWR to develop preliminary maps for the 100- and 200-year floodplains located within the Sacramento-San Joaquin Valley watershed. These maps were developed by DWR to better reflect the most accurate information about the flooding potential in a community and were designed to provide a better understanding of the true risk of flooding to public safety and property. SB 5 requires that these preliminary maps be provided as best available information on flood protection to cities and counties in the watershed for: 1) areas protected by State-Federal project levees, and 2) areas outside the protection of project levees.

The new maps, compiled using information from state, local and federal agencies, have no regulatory status for floodplain development and are for information only. They do not replace existing FEMA regulatory floodplain maps (i.e., FIRMs and DFIRMs) and therefore do not make any changes in federal flood insurance requirements for homes and businesses. However, city and county governments will be able to use the maps to identify areas that warrant further study and to help make informed floodplain management and land use decisions. The floodplains shown on these maps delineate areas with potential exposure to flooding for two different storm events: one with storm flows that have a 1 percent chance of being equaled or exceeded in any year (100-year) and one with storm flows that have a 0.5 percent chance of being equaled or exceeded in any year (200-year).

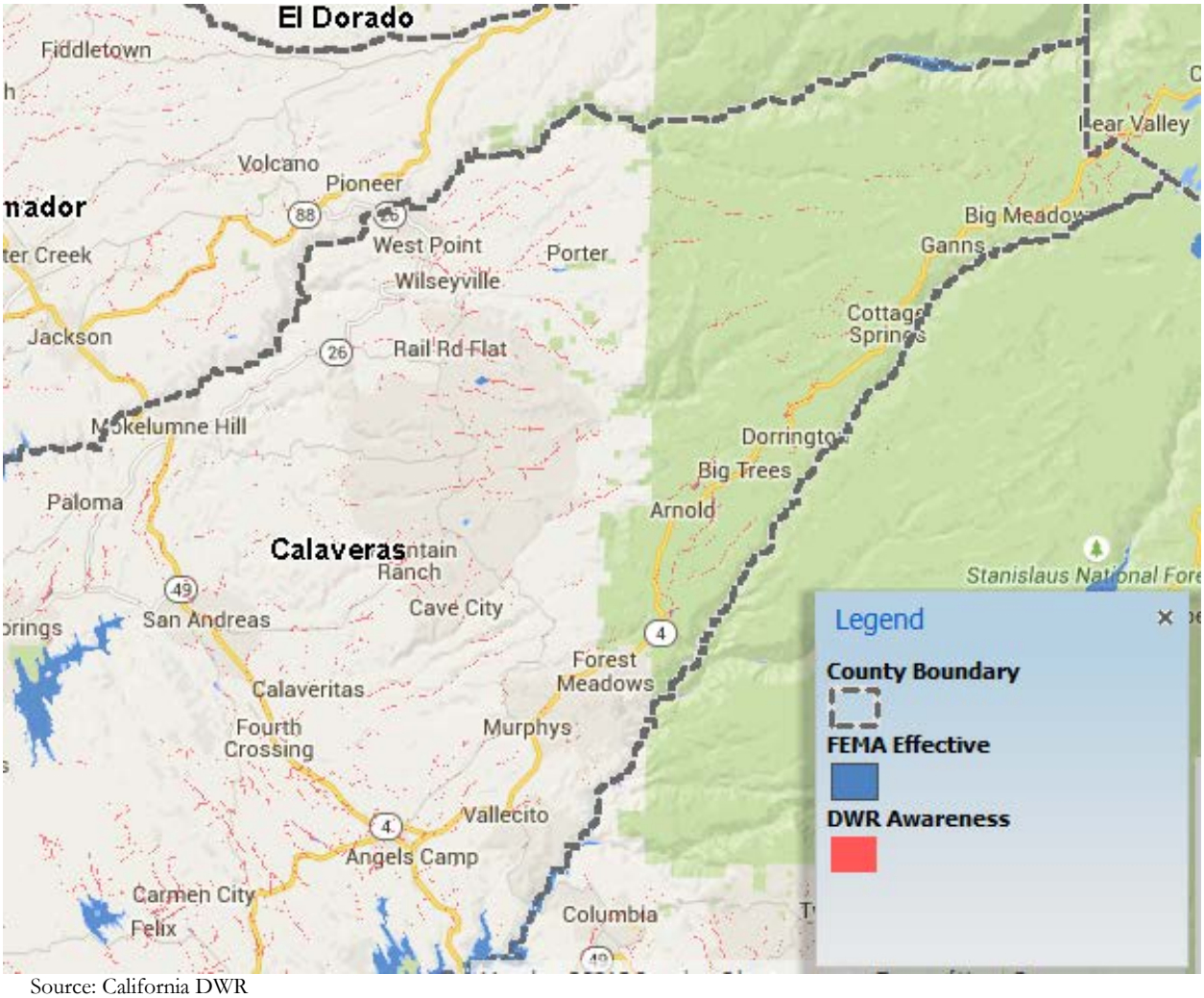
These advisory maps will help communities begin early planning activities to meet SB 5 requirements calling for a minimum of 200-year protection for new development in urban and urbanizing areas. These floodplain maps can be seen in Figure 4-31 and Figure 4-32.

Figure 4-31 Calaveras County Best Available Map – West



Source: California DWR

Figure 4-32Calaveras County Best Available Map – East



Source: California DWR

DWR Awareness Floodplain Maps

The Flood Awareness Maps, developed under the Flood Awareness Mapping Project, are designed to identify all pertinent flood hazard areas by 2015 for areas that are not mapped under the FEMA NFIP and to provide the community and residents an additional tool in understanding potential flood hazards currently not mapped as a regulated floodplain. The awareness maps identify the 100-year flood hazard areas using approximate assessment procedures. The floodplains are shown on these maps simply as flood prone areas without specific depths and other flood hazard data.

The Flood Awareness Maps are shown in Figure 4-31 and Figure 4-32 above and can be accessed online at: http://www.water.ca.gov/floodmgmt/lrafmo/fmb/fes/awareness_floodplain_maps/calaveras/.

Localized Stormwater Flooding

According to the HMPC, localized, stormwater flooding also occurs throughout the County. Urban storm drainpipes and pump stations have a finite capacity. When rainfall exceeds this capacity, or the system is

clogged, water accumulates in the street until it reaches a level of overland release. This type of flooding may occur when intense storms occur over areas of development.

According to the County, numerous parcels and roads throughout the County not included in the FEMA 100- and 500-year floodplains are subject to flooding in heavy rains. These are shown in Table 4-52 in Section 4.2.11. In addition to flooding, damage to these areas during heavy storms includes pavement deterioration, washouts, mudslides, debris areas, and downed trees. The frequency and type of damage or flooding that occurs varies from year to year, depending on the quantity of runoff.

The Jenny Lind Water Treatment Plant (which was pointed out in the previous LHMP of 2006 and 2010) and all Wastewater Treatment Plant Effluent Ponds are at risk to localized flooding.

Past Occurrences

This section deals with past occurrences of both 100-/500-year flooding and localized flooding. The state and federal declarations for storms and flooding were in 1950, 1955, 1958, 1969, 1980, 1982, 1995, 1997, 1998, 2006, and 2010.

The NCDC database tracks flooding for Calaveras County. Entries into the NCDC database since 1993 for Calaveras County are shown in Table 4-23.

Table 4-23 NCDC Flooding Events for Calaveras County 1993 to 10/31/2014

Hazard Type	Date	Injuries*	Fatalities*	Property Damage*	Crop Damage*
Flood	1/23/1996	0	0	$1,000,000	$0
Flood	1/24/1996	0	0	$0	$0
Flood	1/27/1996	0	0	$0	$0
Flood	2/3/1996	2	0	$0	$0
Flood	2/18/1996	0	0	$0	$0
Flood	5/16/1996	0	0	$5,000,000	$0
Flood	12/7/1996	0	0	$7,000,000	$0
Flood	12/12/1996	0	0	$0	$0
Flood	12/22/1996	0	0	$10,000	$0
Flood	12/29/1996	0	0	$20,000	$0
Flood	12/30/1996	0	1	$0	$0
Flood	12/31/1996	0	0	$0	$0
Flood	1/1/1997	2	0	$376,300,000	$0
Flood	1/3/1997	0	1	$0	$0
Flood	9/25/1997	0	0	$0	$0
Totals		**4**	**2**	**$389,330,000**	**$0**

Source: NCDC
*Injuries, fatalities, and damage figures are for the event as a whole, and not solely for Calaveras County.

Based on SHELDUS data from 1960 to 2012, Calaveras County has experienced numerous flood events. A description of flood events in Calaveras County is shown in Table 4-24.

Table 4-24 SHELDUS Flooding Events for Calaveras County 1960 to 2012

Hazard Begin Date	Hazard End Date	Hazard Type Combo	Injuries	Fatalities	Property Damage	Crop Damage	Remarks
1/16/1973	1/16/1973	Flooding - Severe Storm/Thunder Storm	0	0	$86,206.90	$0.00	Heavy Rains, Floods
2/17/1986	2/18/1986	Flooding	0	0	$50,000.00	$0.00	Flash Flooding
2/11/1992	2/13/1992	Flooding - Winter Weather	0	0	$11,627.91	$0.00	Winter Storm, Flash Flood
2/14/1992	2/16/1992	Flooding - Winter Weather	0	0	$9,090.91	$0.00	Winter Storm, Flash Flood
12/10/1992	12/11/1992	Flooding - Wind - Winter Weather	0	0	$1,315.79	$0.00	Winter Storm, High Wind, Flash Flood
3/1/1995	3/31/1995	Flooding - Severe Storm/Thunder Storm - Wind	0	0	$0.00	$11,241,379.31	Flood, Rain, Winds
12/22/1996	12/23/1996	Flooding	0	0	$2,000.00	$0.00	Floods
2/2/1998	2/28/1998	Flooding	0	0	$390,909.09	$709,090.91	Flood
2/3/1998	2/21/1998	Flooding	0	0.17	$0.00	$0.00	Flood
2/9/1999	2/9/1999	Flooding	0	0	$20,000.00	$0.00	Floods
1/23/2000	1/24/2000	Flooding	0	0	$4,000.00	$0.00	Flood
2/11/2000	2/14/2000	Flooding	0	0	$6,428.57	$0.00	Flood
Total			**0**	**0.17**	**$581,579.17**	**$11,950,470.22**	

Source: SHELDUS

Details on recent floods from the NCDC are provided below:

- January 1997 floods: Heavy rains caused a mudslide along Highway 4 in Calaveras County and led to overtopping of Don Pedro Dam in Tuolumne County, resulting in 300 square miles of land flooded and 23,000 homes and 2,000 businesses damaged or destroyed.
- January 12, 1998 – Heavy rains from a strong Pacific storm caused widespread but minor flooding across the Sacramento and Northern San Joaquin Valleys and nearby foothills. Hundreds of traffic accidents occurred on the highways and city streets throughout the region.
- February 9, 1999 flash flood: A flash flood near Valley Springs in Calaveras County occurred when Cosgrove Creek left its banks and flooded four homes and a low-lying golf course. The flood threatened sewage treatment ponds, temporarily closed Highway 26, and caused $20,000 in property damage.

- January 10, 2001 - Automated rain gages throughout Tuolumne and Calaveras counties commonly measured two to three inches of rain in 24 hours. The Gianelli gage measured 3.36 inches.
- April 2006 floods: In June 2006, FEMA designated 17 counties in northern California eligible for public assistance for severe storms and flooding, including Calaveras County. From April 2-6, 2006, Calaveras received 6.8 inches of rain, 168 percent the average amount for the month of April (NWS 2006). Approximately 35 acres of farmland, several homes, and a mobile home park were flooded and many people evacuated. The flood also overflowed sewage treatment plants.

According to the HMPC, Cosgrove Creek floods every few years. This occurs most often when significant periods of rain are followed by thunderstorms. The 2006 flooding occurred after several days of steady rain. Many homes and a highway are in the creek's floodplain.

Likelihood of Future Occurrence

100-500-year Flood

Occasional— The term "100-year flood" is misleading. It is not the flood that will occur once every 100 years. Rather, the 100-year flood is the flood that has a one percent chance in any given year of being equaled or exceeded. Thus, the 100-year flood could occur more than once in a relatively short period of time.

Localized Stormwater Flooding

Highly Likely—With respect to the localized, stormwater flood issues, the potential for flooding may increase as storm water is channelized due to land development. Such changes can create localized flooding problems in and outside of natural floodplains by altering or confining natural drainage channels. Urban storm drainage systems have a finite capacity. When rainfall exceeds this capacity or systems clog, water accumulates in the street until it reaches a level of overland release. With increasing urbanization of the Calaveras County planning area, combined with older infrastructure, this type of flooding will continue to occur during heavy rains.

Climate Change and Flooding/Localized Flooding

According to the CAS, climate change may affect flooding in the County. While average annual rainfall may increase or decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century. It is possible that average soil moisture and runoff could decline, however, due to increasing temperature, evapotranspiration rates, and spacing between rainfall events.

4.2.12. Landslides and Debris Flows

Hazard/Problem Description

According to the California Geologic Survey, a landslide is a general term for a variety of mass-movement processes that generate a down-slope movement of mud, soil, rock, and/or vegetation. For the purposes of this plan, the term landslide includes mudslides, debris flows, and rockfalls that tend to occur suddenly,

whereas erosion is a similar process that tends to occur on smaller scales and more gradually and is not considered a hazard of concern in this plan.

Natural conditions that contribute to landslide include the following:

- Degree of slope
- Water (heavy rain, river flows, or wave action)
- Unconsolidated soil or soft rock and sediments
- Lack of vegetation (no stabilizing root structure)
- Previous wildfires and other forest disturbances
- Road building, excavation and grading
- Earthquake

In addition, many human activities tend to make the earth materials less stable and, thus, increase the chance of ground movement. Human activities contribute to soil instability through grading of steep slopes or overloading them with artificial fill, by extensive irrigation, construction of impermeable surfaces, excessive groundwater withdrawal, and removal of stabilizing vegetation.

Another hazard related to landslide and erosion is the fall of a detached mass of rock from a cliff or down a very steep slope (rockfall). Weathering and decomposition of geological materials produce conditions favorable to rockfalls. Other causes include ice wedging, root growth, or ground shaking (earthquake). Destructive landslides and rockfalls usually occur very suddenly with little or no warning time and are short in duration.

The EOP noted that landslides in Calaveras County tend to occur with the greatest frequency on steep slopes. Based on analysis of areas with both highly erosive soils and steep slopes, locations near Jenny Lind and Ebbetts Pass are at greatest risk from landslide impacts. The western edge of New Hogan Reservoir and southwest of Ebbetts Pass contain significant areas of soils classified as having severe erosion potential, which could lead to possible landslide. Another known area of elevated risk of land movement is near Murphys above McKays Reservoir.

Areas with slopes greater than 50 percent have extreme susceptibility to landslide. Areas of particular concern are those that include high elevations and steep ravines and gulches associated with river and stream channels. Generally, areas of steeper slopes and increased landslide risk are located in the more mountainous eastern portion of the county. Over two percent of the total land area of Calaveras County (14,574 acres) has soils classified as highly susceptible to landslide. These areas were identified based on characteristics of relatively low soil stability and steepness of slope.

Previous Occurrences

A landslide was a factor in a recent federal disaster declaration for Calaveras County in 2006. No details were available from the NCDC, SHELDUS, or from the HMPC. Also, a large mudslide occurred in the Stanislaus National Forest near Highway 4 in January 1997. Known as the Sourgrass Slide, 1 million cubic yards of mud came down, destroying Forest Service roads, heavy equipment, and a bridge. Debris and slash from the slide filled up the Mckay Reservoir. This slide scar is still evident. Other landslide incidents

of varying degrees of magnitude tend to occur in places throughout the county several times in a given year, but in most cases do not cause significant damage or public safety risk.

Probability of Future Occurrences

Occasional—Landslides in the form of debris flow, or mudslides, have occurred in the past in Calaveras County. Rockfalls and landslides occur more frequently in spring months, when high levels of precipitation and runoff combine with saturated soils and/or repeated freezing and thawing, which leads to general slope instability. Landslides often can occur as a result of other hazard events, such as floods, wildfires, or earthquakes.

Climate Change and Landslide/Debris Flows

According to the CAS, increased precipitation may result from climate change. Increased precipitation makes areas more vulnerable to landslide potential.

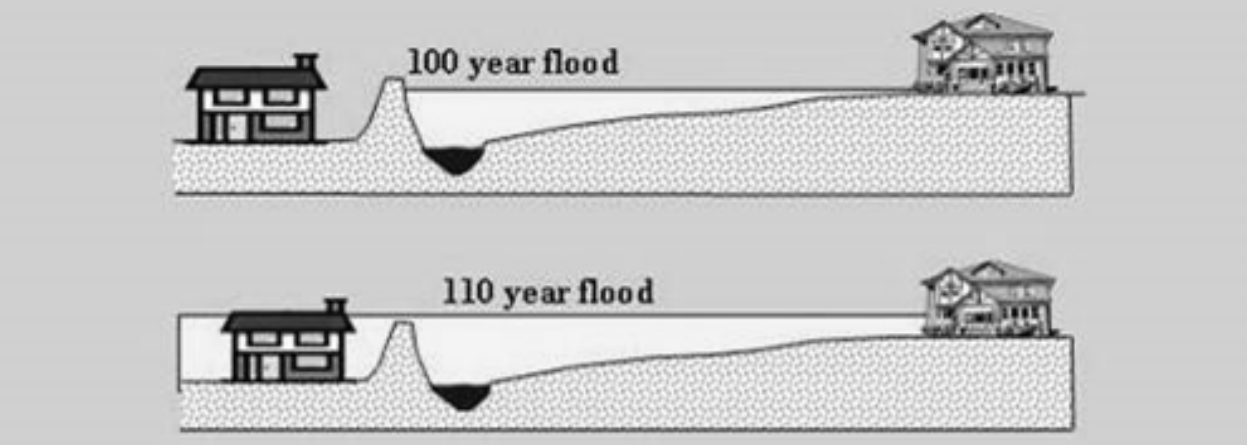
4.2.13. Levee Failure

Hazard/Problem Description

The FIS refers to a levee as a raised area that runs along the banks of a river or canal. Levees reinforce the banks and help prevent flooding. By confining the flow, levees can also increase the speed of the water. Levees can be natural or man-made. A natural levee is formed when sediment settles on the river bank, raising the level of the land around the river. To construct a man-made levee, workers pile dirt or concrete along the river banks, creating an embankment. This embankment is flat at the top, and slopes at an angle down to the water. For added strength, sandbags are sometimes placed over dirt embankments.

Levees provide strong flood protection, but they are not failsafe. Levees are designed to protect against a specific flood level and could be overtopped during severe weather events. Levees reduce, not eliminate, the risk to individuals and structure behind them. Overtopping failure occurs when the flood water level rises above the crest of a levee.

Figure 4-33 Flooding from Levee Overtopping



Source: Levees in History: The Levee Challenge. Dr. Gerald E. Galloway, Jr., P.E., Ph.D., Water Policy Collaborative, University of Maryland, Visiting Scholar, USACE, IWR.
http://www.floods.org/ace-files/leveesafety/lss_levee_history_galloway.ppt

In the December 16, 2010 FIS it was noted that no protecting levees exist within Calaveras County. The National Levee Database also noted that there are no protecting levees existing within the County. This means that while some levees are in place in the County, they are not certified to protect against a 100-year flood. The FIS did note the following about the Cosgrove Creek Levee:

> *Grading Plans for the Cosgrove Creek project were designed to meet the Project Study criteria. The first phase constructed a levee along Cosgrove Creek to provide flood protection. Permits and Streambed Alterations were based on construction of the actual levee. The second phase of construction performed was to mass grade the subdivision site surrounding the levee. Essentially, the mass grading filled all of the area behind the levee, in affect keying to the levee and making the project a "fill" project for lot flood protection rather than a "levee" project for lot flood protection.*

Past Occurrences

There have been no past occurrences of levee failure.

Likelihood of Future Occurrences

Unlikely – Given that there are past occurrences of levee failure in the County, levee failure is unlikely.

Climate Change and Levee Failure

According to the CAS, increased precipitation in the County could result in the possible overtopping of levees. This may be truer in Calaveras County, where the levees are not certified to provide a 100-year level of protection.

4.2.14. Volcanoes

Hazard/Problem Description

The California State Hazard Mitigation Plan identifies volcanoes as one of the hazards that can adversely impact the State. However, there have been few losses in California from volcanic eruptions. Of the approximately 20 volcanoes in the State, only a few are active and pose a threat. Of these, Long Valley Caldera and Lassen Peak are the closest to Calaveras County. The Long Valley area is considered to be an active volcanic region of California and includes features such as the Mono-Inyo Craters, Long Valley Caldera, and numerous active and potential faults. Figure 4-34 shows volcanoes in or near California and the location of the Lassen Peak and the Long Valley area relative to Calaveras County.

Figure 4-34 Active Volcanoes in California and in the Calaveras County Area

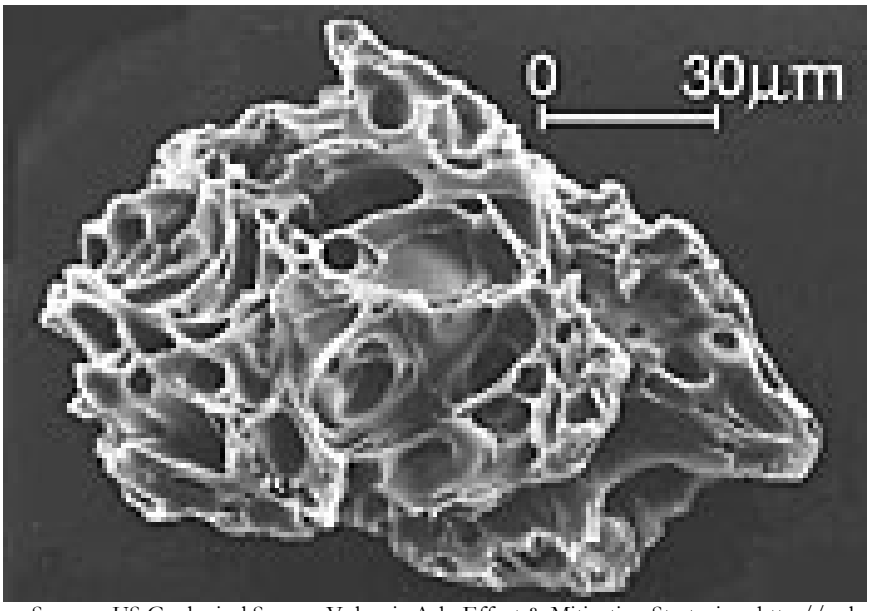
Source: 2013 State of California Hazard Mitigation Plan

Lava and Ash

Steam blasts commonly produce large pits or craters. Explosive eruptions, which may create fiery flows of hot ash (pyroclastic flows), are usually followed by the pushing up of a lava dome. Some less violent eruptions only produce lava flows.

Populations living near volcanoes are most vulnerable to volcanic eruptions and lava flows, although volcanic ash can travel and affect populations many miles away and cause problems for aviation. The USGS notes specific characteristics of volcanic ash. Volcanic ash is composed of small jagged pieces of rocks, minerals, and volcanic glass the size of sand and silt, as shown in Figure 4-35. Very small ash particles can be less than 0.001 millimeters across. Volcanic ash is not the product of combustion, like the soft fluffy material created by burning wood, leaves, or paper. Volcanic ash is hard, does not dissolve in water, is extremely abrasive and mildly corrosive, and conducts electricity when wet.

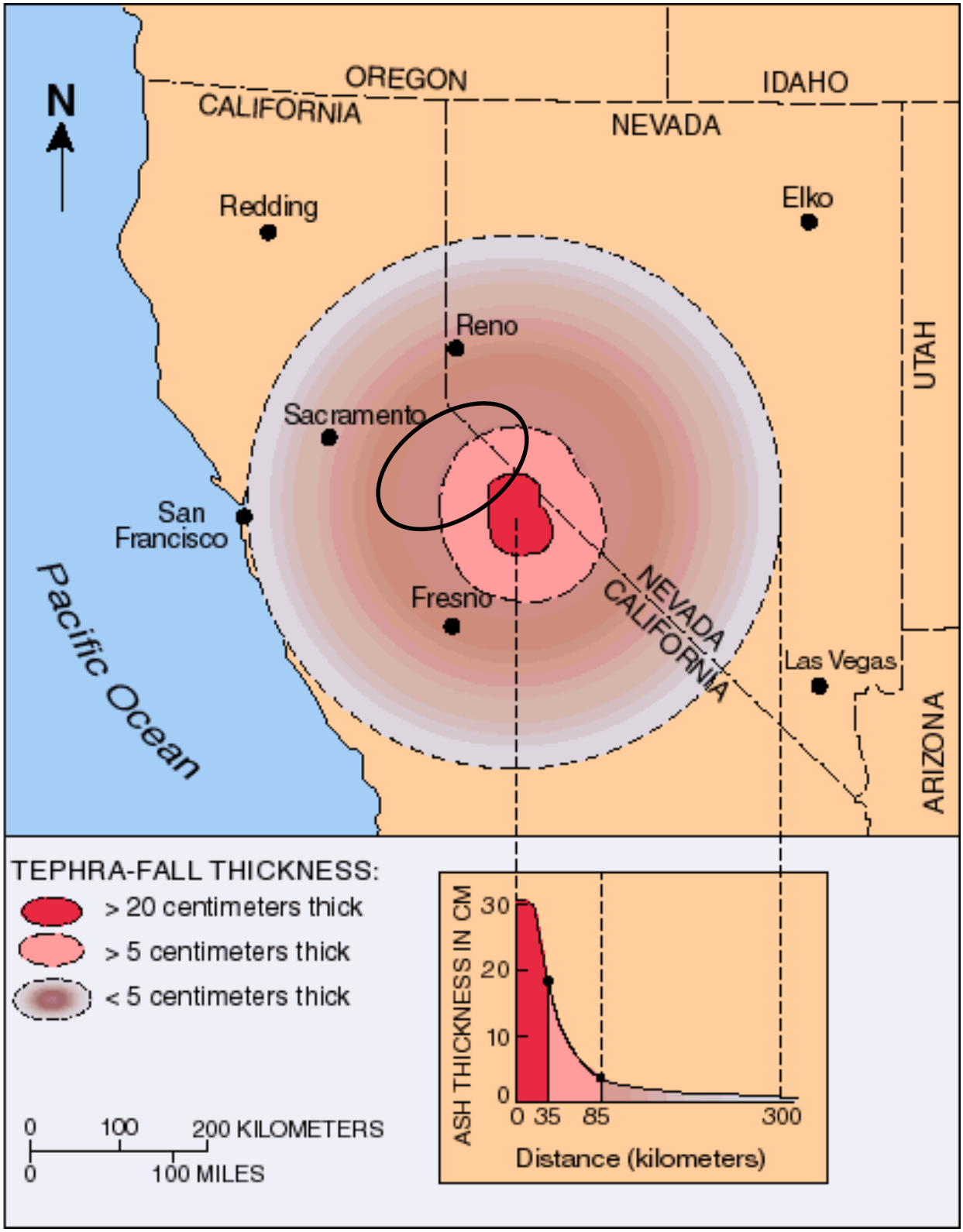
Figure 4-35 Ash Particle from 1980 Mt. St Helens Eruption Magnified 200 Times



Source: US Geological Survey: Volcanic Ash: Effect & Mitigation Strategies. http://volcanoes.usgs.gov/ash/properties.html.

Volcanic ash is formed during explosive volcanic eruptions. Explosive eruptions occur when gases dissolved in molten rock (magma) expand and escape violently into the air, and also when water is heated by magma and abruptly flashes into steam. The force of the escaping gas violently shatters solid rocks. Expanding gas also shreds magma and blasts it into the air, where it solidifies into fragments of volcanic rock and glass. Once in the air, wind can blow the tiny ash particles tens to thousands of miles away from the volcano. Figure 4-36 is a volcanic hazard's ash dispersion map for the Long Valley Caldera, which could possible affect Calaveras County.

Figure 4-36 Volcanic Hazards Ash Dispersion Map for the Long Valley Calder



Source: US Geological Survey

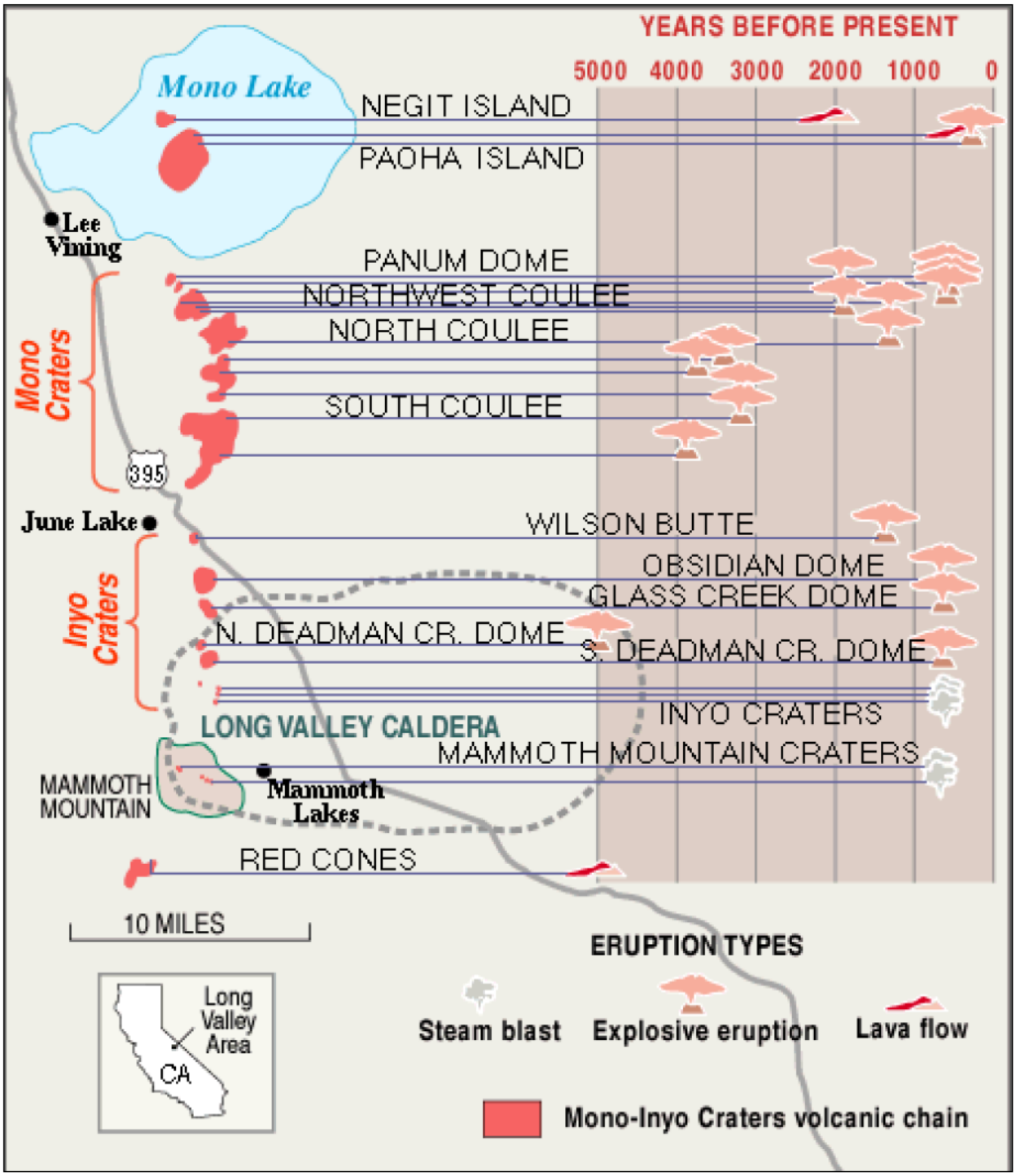
As shown in the inset on the lower right side of Figure 4-36, the average grain-size of rock fragments and volcanic ash erupted from an exploding volcanic vent varies greatly among different eruptions and during a single explosive eruption that lasts hours to days. Heavier, large-sized rock fragments typically fall back to the ground on or close to the volcano and progressively smaller and lighter fragments are blown farther from the volcano by wind. Volcanic ash, the smallest particles (2 mm in diameter or smaller), can travel hundreds to thousands of kilometers downwind from a volcano depending on wind speed, volume of ash erupted, and height of the eruption column.

The size of ash particles that fall to the ground generally decreases exponentially with increasing distance from a volcano. Also, the range in grain size of volcanic ash typically diminishes downwind from a volcano (becoming progressively smaller). At specific locations, however, the distribution of ash particle sizes can vary widely. Based on Figure 4-36, the US Geological Survey estimated that ash of up to 2" or more could fall in areas of Calaveras County.

Past Occurrences

During the past 1,000 years there have been at least 12 volcanic eruptions in the Long Valley area. This activity is likely to continue long into the future. The Long Valley Caldera and Mono-Inyo Craters volcanic chain has a long history of geologic activity that includes both earthquakes and volcanic eruptions. Volcanoes in the Mono-Inyo Craters volcanic chain have erupted often over the past 40,000 years. As shown in Figure 4-37, over the past 5,000 years, small to moderate eruptions have occurred at various sites along the Mono-Inyo Craters volcanic chain at intervals ranging from 250 to 700 years.

Figure 4-37 Volcanic Activity in the Mono-Inyo Craters Volcano Chain in the Past 5,000 Years



Source: U.S. Geological Survey, http://pubs.usgs.gov/fs/fs073-97/eruptions.html

As recently as 1980 four large earthquakes (greater than magnitude 6 on the Richter Scale) and numerous relatively shallow earthquakes occurred in the area. Since then, earthquakes and associated uplift and deformation in the Mammoth Lakes Caldera have continued. Because such activities are common

precursors of volcanic eruptions, the U.S. Geological Survey closely monitors the unrest in the region. There are no records of past impacts from volcanic eruptions to the planning area.

Likelihood of Future Occurrences

Unlikely—According to the U.S. Geological Survey, the pattern of volcanic activity over the past 5,000 years suggests that the next eruption in the Long Valley area will most likely happen somewhere along the Mono-Inyo volcanic chain. However, the probability of such an eruption occurring in any given year is less than 1 percent. The next eruption will most likely be small and similar to previous eruptions along the Mono-Inyo volcanic chain during the past 5,000 years (see Figure 4-37 above). According to the State Multi-Hazard Mitigation Plan, only Medicine Lake, Mount Shasta, Lassen Peak, and the Long Valley Caldera are considered active and pose a threat of future activity. However, due to the location of the planning area relative to the active volcanoes, the State Plan does not consider Calaveras County to be vulnerable to eruption and/or ash from these volcanoes.

Climate Change and Volcano

Climate change is unlikely to affect volcanic eruptions.

4.2.15. Wildfires

Hazard/Problem Description

According to the 2011 Community Wildfire Protection Plan, (CWPP) wildland fire is an ongoing concern for Calaveras County. Generally, the fire season extends from early spring through late fall of each year during the hotter, dryer months. Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, accumulation of vegetation, and high winds.

Wildland Urban Interface

Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire suppression practices have affected the natural cycle of the ecosystem. While wildfire risk is predominantly associated with wildland urban interface (WUI) areas, significant wildfires can also occur in heavily populated areas. The wildland urban interface is a general term that applies to development adjacent to landscapes that support wildland fire. Wildland fires affect grass, forest, and brushlands, as well as any structures located within them.

WUI fires are the most damaging. WUI fires occur where the natural forested landscape and urban-built environment meet or intermix. Even relatively small acreage fires may result in disastrous damages. The damages can be widely varying, but are primarily reported as damage to infrastructure, built environment, loss of socio-economic values and injuries to people.

The pattern of increased damages is directly related to increased urban spread into historical forested areas that have wildfire as part of the natural ecosystem. Many WUI fire areas have long histories of wildland fires that burned only vegetation in the past. However, with new development, a wildland fire following a historical pattern may now burn these newly developed areas. WUI fires can occur where there is a distinct

boundary between the built and natural areas or where development or infrastructure has encroached or is intermixed in the natural area. WUI fires may include fires that occur in remote areas that have critical infrastructure easements through them, including electrical transmission towers, railroads, water reservoirs, communications relay sites or other infrastructure assets.

Potential losses from wildfire include human life, structures and other improvements, natural and cultural resources, quality and quantity of water supplies, cropland, timber, and recreational opportunities. Economic losses could also result. Smoke and air pollution from wildfires can be a severe health hazard. Also of significant concern to the planning area are the secondary impacts associated with a large burn area. Problems occur with landslides, debris flows, erosion, and other issues that lead to a significant loss of watershed. These problems can be compounded by climate conditions.

Consequently, wildland fires that burn in natural settings with little or no development are part of a natural ecological cycle and may actually be beneficial to the landscape. Century old policies of fire exclusion and aggressive suppression have given way to better understanding of the importance fire plays in the natural cycle of certain forest types.

Warning times are usually adequate to ensure public safety, provided that evacuation recommendations and orders are heeded in a timely manner. While in most cases wildfires are contained within a week or two of outbreak, in certain cases, they have been known to burn for months, or until they are completely extinguished by fall rains.

Wildfire in Calaveras County

According to the CWPP, wildfire is an ongoing concern for Calaveras County. Generally, the fire season extends from early spring to late fall. However, with the ongoing drought (as of the writing of this plan), the fire season has transformed into a year around event. Fire conditions arise from a combination of hot weather, an accumulation of vegetation, and low moisture content in the air. These conditions when combined with high winds and years of drought increase the potential for a wildfire to occur. Urban wildfires often occur in those areas where development has expanded into the rural areas. A fire along this urban/rural interface can result in major losses of property and structures. Generally, there are three major factors that sustain wildfires and allow for predictions of a given area's potential to burn. These factors include fuel, topography, and weather.

- **Fuel**—Fuel is the material that feeds a fire and is a key factor in wildfire behavior. Fuel is generally classified by type and by volume. Fuel sources are diverse and include everything from dead tree needles and leaves, twigs, and branches to dead standing trees, live trees, brush, and cured grasses. Also to be considered as a fuel source are manmade structures, such as homes and associated combustibles. The type of prevalent fuel directly influences the behavior of wildfire. Light fuels such as grasses burn quickly and serve as a catalyst for fire spread. In addition, "ladder fuels" can spread a ground fire up through brush and into trees, leading to a devastating crown fire that burns in the upper canopy and cannot be controlled. The volume of available fuel is described in terms of fuel loading.
- **Topography**—An area's terrain and land slopes affect its susceptibility to wildfire spread. Both fire intensity and rate of spread increase as slope increases due to the tendency of heat from a fire to rise

via convection. The arrangement of vegetation throughout a hillside can also contribute to increased fire activity on slopes.

- **Weather**—Weather components such as temperature, relative humidity, wind, and lightning also affect the potential for wildfire. High temperatures and low relative humidity dry out the fuels that feed the wildfire creating a situation where fuel will more readily ignite and burn more intensely. Wind is the most treacherous weather factor. The greater the wind, the faster a fire will spread and the more intense it will be. In addition to wind speed, wind shifts can occur suddenly due to temperature changes or the interaction of wind with topographical features such as slopes or steep hillsides. Lightning also ignites wildfires, which are often in backcountry terrain that is difficult for firefighters to reach. Drought conditions contribute to concerns about wildfire vulnerability. During periods of drought, the threat of wildfire increases.

The 2011 Fire Management Plan noted that being located in the heart of the central Sierra Nevada range, Calaveras County features examples of a wide range of challenging topography, fuels, and weather. These naturally occurring elements have a great deal of influence on the nature of wildland fires within its boundaries. Generally, wildfire risk is highest across a broad section of the central and eastern sections of the planning area. Areas of very high or high wildfire severity constitute at least 85 percent of the County (see Figure 4-54 in Section 4.3.10). An expanding population increases the potential for large and damaging fires. Types of fuels in the County are shown in Table 4-25.

Table 4-25 Location and Hazard Ranking of Fuel Models in Calaveras County

Fuel Model	Fire Hazard Ranking	Location in Calaveras County
Grass	Moderate to High	West of Highway 49 in the lower foothills. Moderate to high fuel hazard ranking depends on slope.
Woodland	High to Very High	Scattered between 800 to 4,000 feet in elevation; fuel hazard ranking depends on slope.
Brush	Very High	Larger blocks in the 800 to 4,000-foot elevation in less inhabited areas of the county. Areas near New Hogan, Bear Mountain, and New Melones have large concentrations of brush as well as areas north of San Andreas.
Brush/Hardwood	High	Areas with a mixture of live oak, black oak, manzanita, and chamise between 1,000 to 4,000 feet in elevation. Large blocks occur east of Highway 49.
Heavy Timber	Very High	Consists of larger, denser dead fuels on the ground. Primarily found above 3,500 feet and in scattered blocks between Arnold and West Point.

Source: California Department of Forestry; Tuolumne-Calaveras Unit Pre-Fire Management Plan, 2011

The grasslands of the rolling western plains routinely experience extreme summer heat, and significant wind events during the spring and fall months. In these areas motorized fire equipment can be fully utilized to great success. The brush fields common throughout the central portions of the County lay over broad expanses of steep hillsides and atop narrow ridgelines between the deepening river canyons. Here too routine summer temperatures can be extreme, while the topography makes access increasingly difficult for motorized equipment. The brush transitions into the mixed oak and conifer zones as the elevation increases and the canyon depth and width increase significantly.

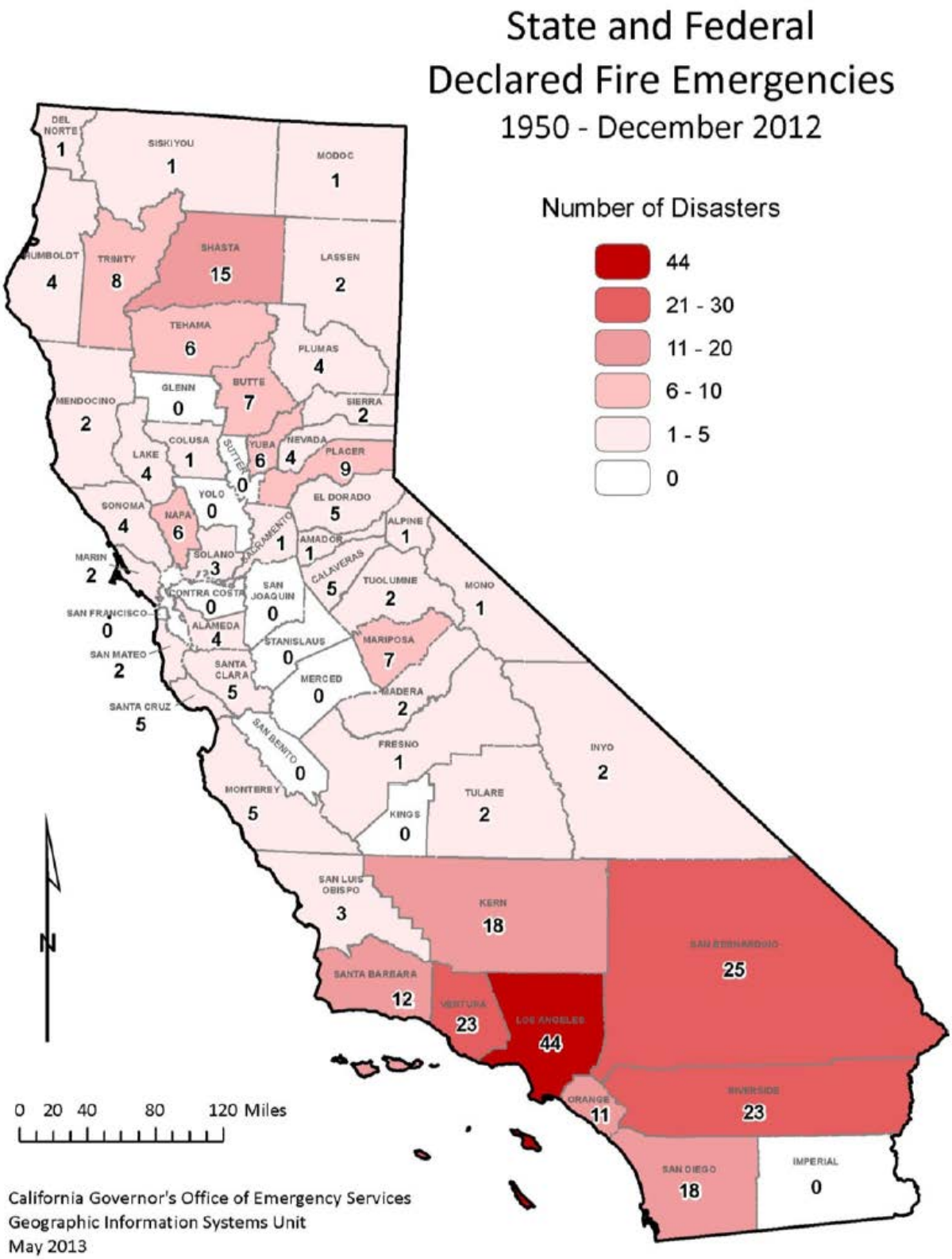
Over 38% of the CAL FIRE protected lands are covered with these high hazard brush and timber fuels. This mid-elevation area also experiences high summer temperatures, and is most affected by the normal diurnal winds associated with the canyon-dominated topography. The higher elevation zone features dense stands of conifer timber much of which exhibits large accumulations of ground and ladder fuels. While routinely temperatures are moderated due to the elevation, wind events in the fall contribute to potentially challenging fire conditions. Historically, severe fire weather occurs throughout the Unit on 35% of days during the fire season.

The convergence of significant fire weather conditions, a wide variety of topography and a broad spectrum of fuels has resulted in a long history of large damaging fires within the County. Fire weather is sampled daily during the wildfire season at stations throughout California to create critical fire weather frequency, which is classified in three categories. Calaveras County is rated in the highest frequency class.

Past Occurrences

Wildfires of varying scales occur on an annual basis in Calaveras County. Calaveras County has received state disaster declarations for wildfires in 1988, 1992, and 2001 and a federal declaration (DR-958) in 1992 and 2 in 2004 (FM 2540 and FM 2553). These are shown in Figure 4-38.

Figure 4-38 Calaveras County Wildfire Declarations from 1950 to 2012



Source: 2013 California State Hazard Mitigation Plan

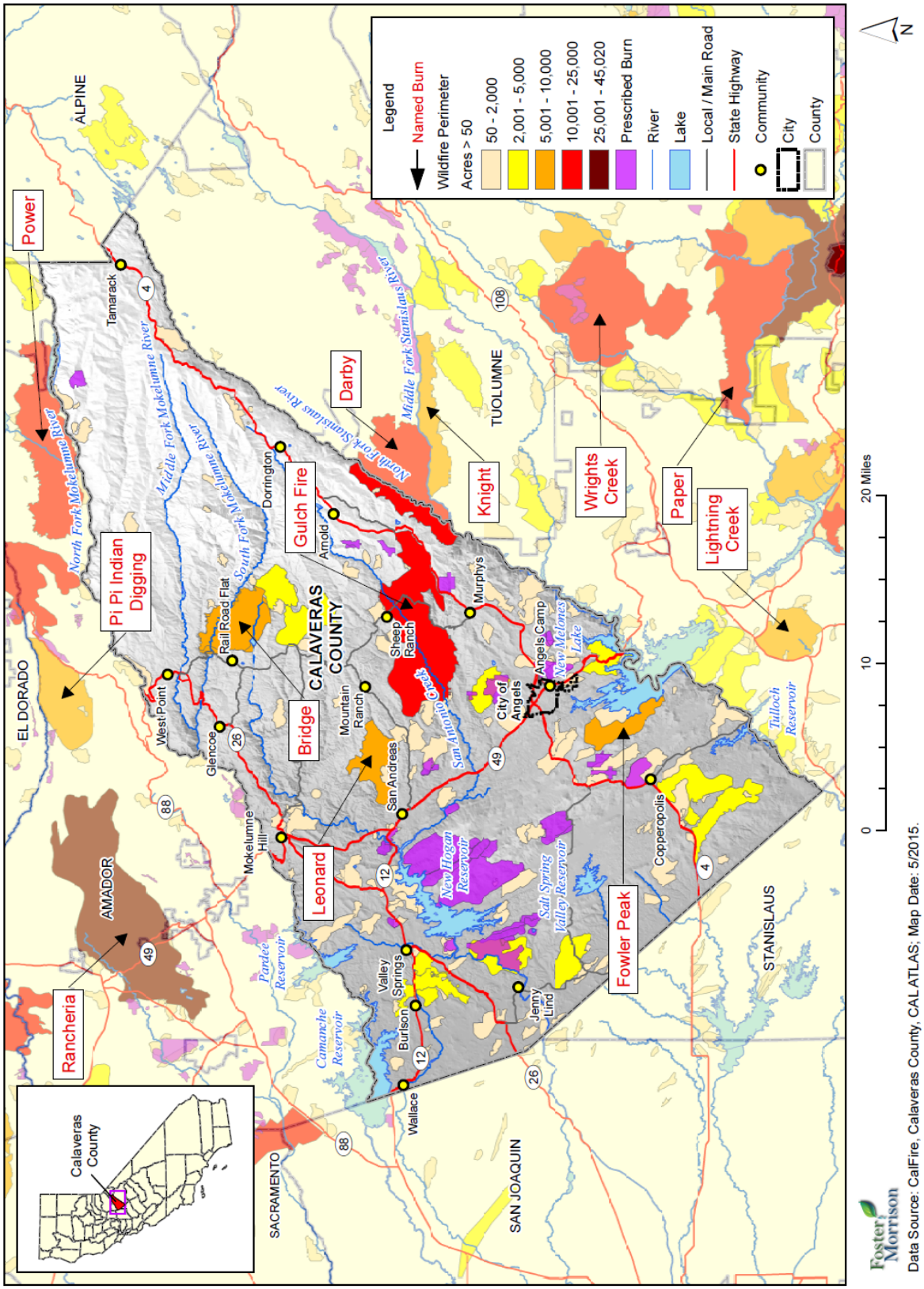
Wildfire History

CAL FIRE, USDA Forest Service Region 5, Bureau of Land Management (BLM), the National Park Service (NPS), Contract Counties and other agencies jointly maintain a comprehensive fire perimeter GIS layer for public and private lands throughout the state. The data covers fires back to 1878 (though the first recorded incident for the County was in 1917). For the National Park Service, Bureau of Land Management, and US Forest Service, fires of 10 acres and greater are reported. For CAL FIRE, timber fires greater than 10 acres, brush fires greater than 50 acres, grass fires greater than 300 acres, and fires that destroy three or more residential dwellings or commercial structures are reported. CAL FIRE recognizes the various federal, state, and local agencies that have contributed to this dataset, including USDA Forest Service Region 5, BLM, National Park Service, and numerous local agencies.

Fires may be missing altogether or have missing or incorrect attribute data. Some fires may be missing because historical records were lost or damaged, fires were too small for the minimum cutoffs, documentation was inadequate, or fire perimeters have not yet been incorporated into the database. Also, agencies are at different stages of participation. For these reasons, the data should not be used for statistical or analytical purposes.

The data provides a reasonable view of the spatial distribution of past large fires in California. Using GIS, fire perimeters that intersect Calaveras County were extracted and are listed in Table E-1 in Appendix E. There are 221 fires recorded in this database for Calaveras County. 176 of these burned areas greater than 50 acres. Each of them was tracked by Cal Fire; Cal Fire last updated this database in June 2014. Table E-1 lists each fire's date, cause, name, and calculated acreage. Figure 4-39 shows fire history for the County, colored by the size of the acreage burned. Detailed tables of wildfire are shown in Appendix E.

Figure 4-39 Calaveras County Wildfire History



The following summarizes major wildfires in Calaveras County since 1959:

- 1959 - The Forest Creek Fire, located 10 miles east of West Point, burned approximately 528 acres of timber.
- June 6, 1979 Fowler Peak – This fire burned 5,237 acres Calaveras County. The fire's cause was unknown. Damage estimates, injuries, and deaths were unavailable.
- 1988 - The Railroad Flat Complex Fire consisting of the Bridge (6,690 acres) and Mason (4,050 acres) fires located to the East of Railroad Flat and Mountain Ranch burning a total of 10,740 acres.
- August 1992 Old Gulch fire/Shasta fires (DR-958)—Damage was estimated at $54 million across Calaveras and Shasta Counties. Eight people were injured.
- August 1996 Keystone fire—7,000 acres burned within the California Department of Forestry Tuolumne-Calaveras Unit (TCU). 20 homes were destroyed and 7 damaged by this lightning-caused fire.
- July 19, 1988 Bridge Fire – This fire burned almost 7,000 acres Calaveras County. The fire was attributed to arson and was finally extinguished on July 26, 1988. Damage estimates, injuries, and deaths were unavailable.
- September 1999 Winton Incident fire—120 acres burned near West Point. Two homes, two outbuildings, and two vehicles were destroyed. Total costs, including firefighting, totaled $740,000.
- 2001 fire season—30,137 acres burned in the TCU. State fire disaster declaration.
- 2002 fire season—884 acres burned in the TCU.
- 2003 fire season—884 acres burned in the Tuolumne-Calaveras Unit (TCU).
- 2004 fire season—7,796 acres burned in 380 separate fires, totaling over $10 million in damage. 26 homes were destroyed. The majority of acreage burned and property damage were due to three fires, the Copperopolis fire (3,844 acres burned, 1 home destroyed), the Armstrong Complex (963 acres burned, 3 homes destroyed), and the Pattison fire (2,676 acres burned, 17 homes destroyed). These occurrences were mostly human-caused, including fires started by vehicle/equipment misuse and arson.
- 2015 Butte Fire—The Butte Fire started on September 9, 2015 at 2:25 pm. This wildland fire stated at Butte Mountain Road in the Counties of Amador and Calaveras. The fire moved quickly triggering numerous mandatory evacuations. Many roads were damaged and utilities were out for days in certain areas as power lines burned. The fire burned 70,868 acres and destroyed 965 structures. Of these, 571 were single family residences. The Butte Fire area involved USGS Quadrants of the Mokelumne Hill, Rail Road Flat, Pine Grove, West Point, San Andreas, Calaveritas, Murphys, and Fort Mountain maps. The fire burned through multiple drainages, mainly in Calaveras County, including the Mokelumne River, Jesus Maria Creek, Calaveras River, Murray Creek and Calaveritas Creek. The drainages, in general, have an east to west direction as they drain from the foothills to the Central Valley. The slopes in the fire area range from 75% or more in the drainages to flat terrain in the valleys. Much of the terrain is divided by the multiple drainages and their many tributaries. The elevation ranges from approximately 600 feet in the Mokelumne River to almost 3,000 feet at the peaks to the east. The ownership of the land affected by the fire includes private State Responsibility Area (SRA) and Bureau of Land Management (BLM). All of the fire area was within the State Direct Protection Area. A Federal Disaster Declaration was provided to Calaveras County as a result of the Butte Fire.

Likelihood of Future Occurrence

Highly Likely—The season when wildfire is most likely to occur generally runs from late June through October. This is due to hot, dry conditions during this time of year and an increase in population throughout the County in the summer months as vacation homes are visited and seasonal workers converge on the area.

According to the 2011 TCU Pre-Fire Management Plan, daily severe fire weather conditions are present for approximately 35 percent of the fire season. The 4th of July and Labor Day holiday weekends are specific times when probability is higher than average.

Climate Change and Wildfire

According to the CAS, warmer temperature can exacerbate drought conditions. Drought often kills plants, which serve as fuel for wildfires. Warmer temperatures could increase the number of wildfires and pest outbreaks, such as the western pine beetle.

4.2.16. Natural Hazard Summary and Prioritization

Table 4-2 in Section 4.2 showed the initial prioritization of hazards for Calaveras County. After a review of the hazard profiles, the HMPC reprioritized what hazards were of importance. Table 4-26 summarizes the results of the hazard identification and hazard profile for the County based on the hazard identification data and input from the HMPC. Table 4-26 includes the likelihood of future occurrence and whether the hazard is considered a priority hazard for the County. Changes from Table 4-2 include removing dam failure and severe weather: wind from being priority hazards.

Table 4-26 Hazard Identification and Determination of Priority Hazard: Calaveras County

Hazard	Likelihood of Future Occurrence	Priority Hazard
Agricultural Hazards	Highly Likely	Y
Avalanche	Unlikely	N
Dam Failure	Occasional	N
Drought and Water Shortage	Likely	Y
Earthquake	Occasional/Unlikely	N*
Flood 100/500 year	Occasional	Y
Flood: Localized Stormwater Flooding	Highly Likely	Y
Landslides and Debris Flows	Occasional	N
Levee Failure	Unlikely	N
Severe Weather: Extreme Heat	Highly Likely	N
Severe Weather: Heavy Rains and Storms	Highly Likely	Y
Severe Weather: Wind (includes tornadoes)	Highly Likely	N
Severe Weather: Winter Storms and Extreme Cold	Highly Likely	Y
Volcano	Unlikely	N
Wildfire	Highly Likely	Y

*Although considered a low priority by the HMPC, due to the significance of earthquake in California, a vulnerability assessment was performed for earthquake.

4.3 Vulnerability Assessment

Requirement §201.6(c)(2)(ii): [The risk assessment shall include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community.

Requirement §201.6(c)(2)(ii)(A): The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas.

Requirement §201.6(c)(2)(ii)(B): [The plan should describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) of this section and a description of the methodology used to prepare the estimate.

Requirement §201.6(c)(2)(ii)(C): [The plan should describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

With Calaveras County's hazards identified and profiled, the HMPC conducted a vulnerability assessment to describe the impact that each priority hazard would have on the County. The vulnerability assessment quantifies, to the extent feasible using best available data, assets at risk to natural hazards and estimates potential losses.

This vulnerability assessment followed the methodology described in the FEMA publication *Understanding Your Risks—Identifying Hazards and Estimating Losses*. The vulnerability assessment first describes the total vulnerability and values at risk and then discusses vulnerability by hazard.

Data used to support this assessment included the following:

- County GIS data (hazards and base layers);
- Calaveras County Assessor's Data
- Statewide GIS datasets from other agencies such as Cal OES, FEMA, USGS, CGS, Cal Atlas, and others;
- CAL FIRE GIS datasets;
- Calaveras County staff
- City of Angels Camp staff
- Written descriptions of inventory and risks provided by the County and City of Angels Camp;
- Existing plans and studies; and
- Personal interviews and discussions with planning team members and staff from the County and City of Angels Camp.

4.3.1. Calaveras County's Vulnerability and Assets at Risk

As a starting point for analyzing the planning area's vulnerability to identified hazards, the HMPC used a variety of data to define a baseline against which all disaster impacts could be compared. If a catastrophic

disaster was to occur in the planning area, this section describes significant assets at risk in the planning area. Data used in this baseline assessment included:

- Total County assets at risk;
- County critical facilities;
- Cultural, historical, and natural resources; and
- Growth and development trends.

Total Assets at Risk

The total assets at risk for Calaveras County is intended to capture the values associated with assessed assets located within the Calaveras County planning area. In developing this information, the 2014 Calaveras County Assessor's Office Certified Roll Values were obtained and combined with the 2013 GIS parcel layer obtained from the Calaveras County Department of Information Technology. This data provided by Calaveras County represents best available data.

Understanding the total assessed value of Calaveras County is a starting point to understanding the overall value of the planning area. When the total assessed values are combined with potential values associated with other community assets such as critical facilities, natural resources, cultural and historic resources, and public and private infrastructure, the big picture emerges as to what is potentially at risk and vulnerable to the damaging effects of natural hazards within the County.

Data Limitations

Although based on best available data, the resulting information should only be used as an initial guide to overall values in the County, as the information and associated analysis has its limitations. One issue identified with respect to this specific data was found during the joining of the GIS parcel layer records to the Assessor data records. There is a parcel-to-record discrepancy between the GIS parcel data and the Assessor's database. The discrepancy identifies 43,370 GIS parcels and 46,704 Assessor records, resulting in 3,334 records which were not able to link to a parcel within the GIS layer. One reason for this discrepancy may be due to the different dates of these two datasets as previously mentioned. Another reason that these "extra" records aren't captured by the County GIS dataset may be attributed to their parcel descriptions which include condos, tracts, timeshares, or sublots. The total value of these extra assessor records is around $59 million and account for about 49,500 acres. These values are not captured in the asset tables.

Another limitation to assessed values within the County is created by Proposition 13. Instead of adjusting property values annually, the values are not adjusted or assessed at fair market value until a property transfer occurs. As a result, overall value information is most likely low and, on the whole, does not reflect current market value of properties within the County. It is also important to note, in the event of a disaster, it is generally the value of the infrastructure or improvements to the land that is of greatest concern or at risk to damages. Depending on the type of hazard and resulting damages, the land itself may not be a loss.

Also to be noted with the data utilized for these analyses, within the GIS parcel layer there are 1,759 right-of-way (ROW) parcels and 7 (WOW) water-of-way parcels which do not contain assessment values. As such, these parcels are not included in the Total Assets at Risk Tables detailed below and are also excluded from further hazard analyses.

Methodology

The 2014 Calaveras County Certified Roll Values were used as the basis for the inventory of assessed values for both improved and unimproved parcels within the planning area. The data shows the land value and improved values for each parcel, along with a land use code (property type). Each parcel record was attributed with its jurisdiction name (Unincorporated Calaveras County or City of Angels Camp) based on whether its parcel centerpoint fell in or out of those jurisdictional boundaries.

Use Codes within the parcel layer were used to categorize the parcels into distinct property types, including Agricultural, Commercial, Institutional, Other, Residential, and Vacant Land. The Calaveras County Assessor List of Use Codes document was used to translate use codes into descriptive use labels, which were grouped into the distinct categories mentioned above based on use description and best judgment. In cases where multiple categories could apply to a single parcel, a single category was assigned based on improvement values and, in a limited number of cases, photo analysis. Once Use Codes were grouped into categories, the number of total and improved parcels were inventoried by jurisdiction. Values associated with land and structure and other improvements were identified and summed in order to determine total values at risk in the Calaveras County planning area and specific to each jurisdiction. In determining values specific to each property, the Land Value is reflected in its own category as well as the Improved Structure Value. The Other Improved Value (see Table 4-27) category was obtained by summing (for each parcel record); 1) the total of the Current Fixed Improved Value; 2) the Current Growing Improved Value; 3) the Current Personal Property Improved Value; and 4) the Current Personal Property Mobile Home Improved Value. Together, the Land Value, Improved Structure Value, and Improved Other Value, as applicable, make up the total assessed value associated with each identified parcel.

Table 4-27 Calaveras County Improved Value and Other Improved Value Description

Improved Value	Category	Description
Improved Structure Value	Structural Improvement	Residences, barns, offices, etc.
Other Improved Value	Fixed Improvement	Improvements to stakes, cross arms, wine racks, computers (in a tasting room). If it is noted as "fixtures", it is attached to the property.
	Growing Improvement	Vineyards, could also be orchards such as olive, walnut, fruit etc.
	Personal Property Improvement	Equipment improvements such as machinery, bottling equipment, backhoes, etc.
	Personal Property Mobile Home Improvement	Mobile home improvements on the land used by a caretaker.

Source: Calaveras County Assessor's Office

The Calaveras County planning area has a total land value of $1.6 billion, improved structure value of $4.1 billion, and a total value of $5.7 billion. Unincorporated Calaveras County has 24,764 improved parcels with a total value (both land and improvements) of just over to $5.3 billion. The City of Angels Camp has a total land value of $113 million, improved structure value of $324 million, and total value of $441 million. Table 4-28 shows the 2014 assessor values for the entire Calaveras County planning area (i.e., the total values at risk) by jurisdiction.

The values for unincorporated Calaveras County are broken out by land use type and are provided in Table 4-29. The residential land use has the most structures with 22,652, and is also the land use with the greatest value with over $3.5 billion.

Table 4-28 Calaveras County Planning Area - Total Exposure by Jurisdiction

Jurisdiction	Total Parcel Count	Total Land Value	Improved Parcel Count	Improved Structure Value	Improved Other Value	Total Value
City of Angels Camp	2,232	$113,628,402	1,599	$324,497,161	$2,881,438	$441,007,001
Unincorporated	39,372	$1,506,349,752	24,764	$3,789,991,153	$28,277,933	$5,324,618,838
Total	**41,604**	**$1,619,978,154**	**26,363**	**$4,114,488,314**	**$31,159,371**	**$5,765,625,839**

Source: Calaveras County 2014 Assessor's Data, Calaveras County Parcel Layer 2013

Table 4-29 Unincorporated Calaveras County - Total Exposure by Property Type

Property Use	Total Parcel Count	Total Land Value	Improved Parcel Count	Improved Structure Value	Improved Other Value	Total Value
Agriculture	8,378	$552,822,302	4,837	$715,514,091	$9,393,975	$1,277,730,368
Commercial	551	$54,773,079	471	$154,405,468	$7,356,038	$216,534,585
Institutional	588	$507,385	2	$178,475	$0	$685,860
Other	3,015	$77,852,414	315	$68,946,205	4,937,671	$151,736,290
Residential	22,652	$725,040,566	19,076	$2,845,221,286	$6,280,501	$3,576,542,353
Vacant Land	4,188	$95,354,006	63	$5,725,628	$309,748	$101,389,382
Total	**39,3724**	**$1,506,349,752**	**24,764**	**$3,789,991,153**	**$28,277,933**	**$5,324,618,838**

Source: Calaveras County 2014 Assessor's Data, Calaveras County Parcel Layer 2013

Critical Facilities

For purposes of this plan, a critical facility is defined as:

> *Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.*

A critical facility is classified by the following categories: (1) Essential Services Facilities, (2) At-risk Populations Facilities, and (3) Hazardous Materials Facilities.

- **Essential Services Facilities** include, without limitation, public safety, emergency response, emergency medical, designated emergency shelters, communications, public utility plant facilities and equipment, and government operations. Sub-Categories:
  - ✓ Public Safety - Police stations, fire and rescue stations, emergency operations centers
  - ✓ Emergency Response - Emergency vehicle and equipment storage and essential governmental work centers for continuity of government operations.
  - ✓ Emergency Medical - Hospitals, emergency care, urgent care, ambulance services.

- ✓ Designated Emergency Shelters.
- ✓ Communications - Main hubs for telephone, main broadcasting equipment for television systems, radio and other emergency warning systems.
- ✓ Public Utility Plant Facilities - including equipment for treatment, generation, storage, pumping and distribution (hubs for water, wastewater, power and gas).
- ✓ Essential Government Operations - Public records, courts, jails, building permitting and inspection services, government administration and management, maintenance and equipment centers, and public health.
- ✓ Transportation Lifeline Systems - Airports, helipads, and critical highways, roads, bridges and other transportation infrastructure (Note: Critical highways, roads, etc. will be determined during any hazard-specific evacuation planning and are not identified in this plan).

- **At Risk Population Facilities** include, without limitation, pre-schools, public and private primary and secondary schools, before and after school care centers with 12 or more students, daycare centers with 12 or more children, group homes, and assisted living residential or congregate care facilities with 12 or more residents.
- **Hazardous Materials Facilities** include, without limitation, any facility that could, if adversely impacted, release of hazardous material(s) in sufficient amounts during a hazard event that would create harm to people, the environment and property.

A fully detailed list of all critical facilities in the planning are can be found in Appendix F. A summary of critical facilities in the County can be found in Table 4-30 and Figure 4-40.

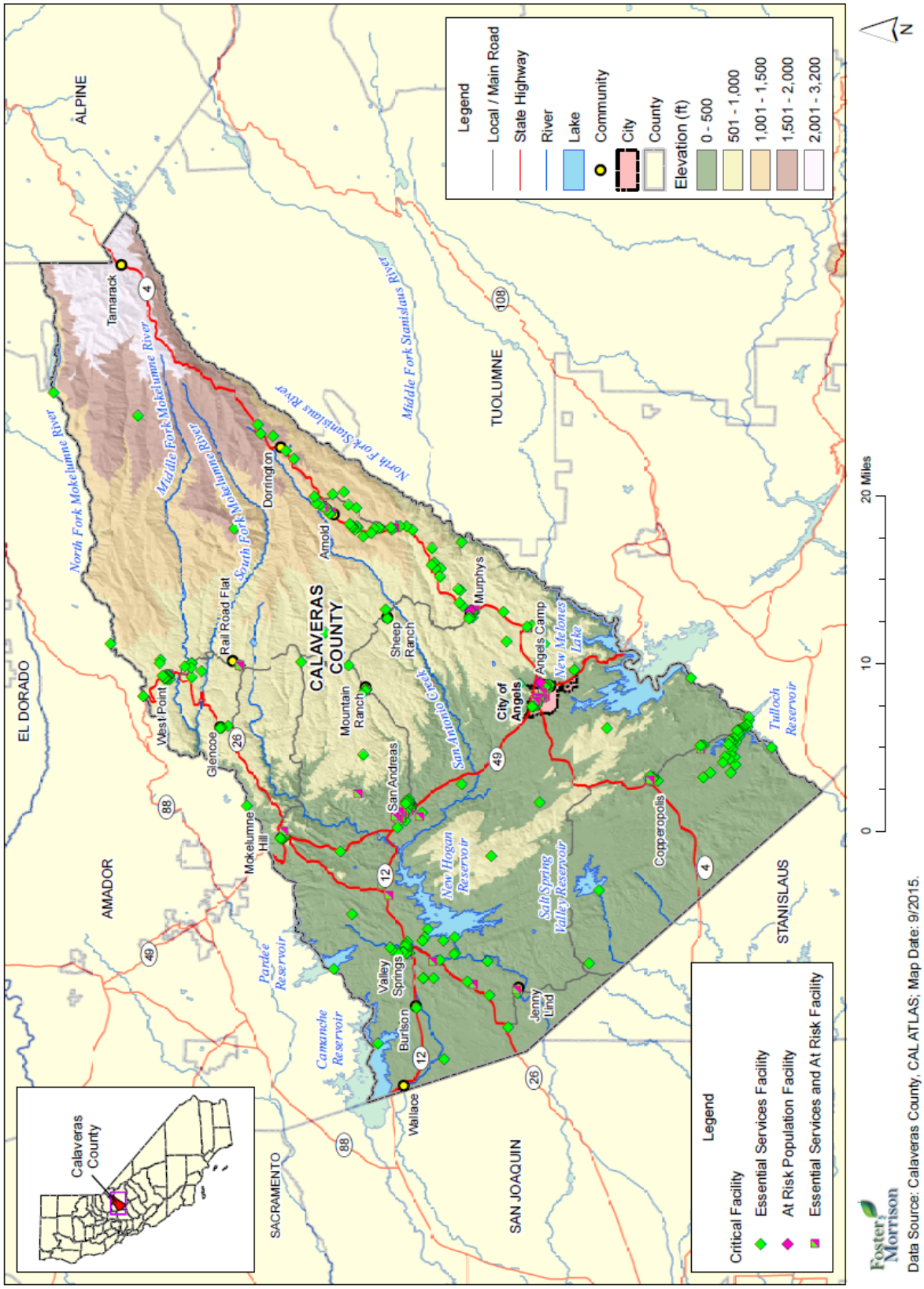
Table 4-30 Calaveras County Planning Area – Critical Facilities Summary

Category	Type	**Facility** Count
City of Angels Camp		
At Risk Population Facilities	Congregate Care Facility	1
Essential Services Facilities	Community Food Bank / Pantry	4
	Emergency Medical	1
	Fire Station	4
	Government Operations	1
	Medical Health Facility	2
	Police	1
	Power Utility	1
Hazardous Materials Facilities	Hazardous Materials Facilities	0
Essential Services Facilities and At Risk Population Facilities	School / Emergency Shelter	11
Total City of Angels Camp		**26**
Unincorporated Calaveras County		
At Risk Population Facilities	Assisted Living Facility	0
	Congregate Care Facility	3
	School	0
Essential Services Facilities	Communications	6

Category	Type	**Facility** Count
	Community Food Bank / Pantry	14
	Emergency Evacuation Shelter	22
	Emergency Medical	4
	Fire Station	33
	Government Operations	23
	Medical Health Facility	7
	Other Public Utility	9
	Police	8
	Power Utility	12
	Sewer Facility	2
	Solid Waste Facility	1
	Transfer Station	7
	Transportation	2
	Veterans Post	6
	Waste Water Facility	45
	Water Facility	33
Hazardous Materials Facilities	Hazardous Materials Facilities	0
Essential Services Facilities and At Risk Population Facilities	School / Emergency Shelter	43
Total Unincorporated County		**280**
Total Planning Area		**306**

Source: Calaveras County GIS

Figure 4-40 Calaveras County Planning Area – Critical Facilities



Natural, Historical, and Cultural Resources

Assessing the vulnerability of the County to disaster also involves inventorying the natural, historic, and cultural assets of the area. This step is important for the following reasons:

- The community may decide that these types of resources warrant a greater degree of protection due to their unique and irreplaceable nature and contribution to the overall economy.
- If these resources are impacted by a disaster, knowing so ahead of time allows for more prudent care in the immediate aftermath, when the potential for additional impacts are higher.
- The rules for reconstruction, restoration, rehabilitation, and/or replacement are often different for these types of designated resources.
- Natural resources can have beneficial functions that reduce the impacts of natural hazards, such as wetlands and riparian habitat, which help absorb and attenuate floodwaters.

Natural Resources

Calaveras County has a variety of natural resource assets that to a large extent serve as the basis for the county's economy and quality of life. These assets include water, critical species, and wildlife and plant habitat. Natural resource assets are important to include in benefit-cost analyses for future projects and may be used to leverage additional funding for mitigation projects that also contribute to community goals for protecting sensitive natural resources. Awareness of natural assets can lead to opportunities for meeting multiple objectives. For instance, protecting wetlands areas protects sensitive habitat as well as attenuates and stores floodwaters.

The County encompasses approximately 663,453 acres. This area is split among many different natural communities. A breakdown is shown on Table 4-31. Information on each type of land use follows the table.

Table 4-31 Calaveras County Land Use Types

Land Use Type	Area (acres)	Percent of County
Drainages	57.0	0.009%
Seasonal Wetland	87.1	0.013%
Coniferous Forest	210,307.7	31.70%
Chaparral	76,782.5	11.57%
Montane Hardwood	79,539.0	11.99%
Riparian Woodland	226.0	0.034%
Valley Oak Woodland	246.0	0.037%
Foothill Woodland	120,607.6	18.18%
Anthropogenic	2,008.1	0.303%
Non-Native Annual Grassland	151,975.3	22.91%
Urban	7,313.2	1.10%
Lakes & Rivers	14,303.2	2.16%

Land Use Type	Area (acres)	Percent of County
Total	**663,452.7**	**100%**

Source: Calaveras County 2014 Draft General Plan Background Report

Anthropogenic Communities

Communities dominated by plants that are introduced by humans and established or maintained by human disturbance are "anthropogenic communities." Primarily, there are three such communities in the County: agrestal (crops), plantation (vineyard and orchard), and ruderal.

Non-Native Annual Grassland

Prior to the settlement of Europeans in California, California grasslands and savannahs were dominated by native, perennial bunchgrasses. When the Europeans settled California, woodland vegetation was cleared for settlement, to allow grazing opportunities and for commercial purposes. At the same time a variety of Mediterranean grasses and forbs (broad-leaved plants) were brought to California and introduced as crops or ornamental species, or inadvertently were transported to California grassland communities in the fur and digestive systems of livestock. Land use changes including land clearing, planting to livestock friendly grasses, and heavy domestic animal grazing changed the landscape and the oak savannah/ grassland communities. The highly palatable native grassland plants and forbs were out-competed by the introduced exotic species. Today, introduced species tolerant of grazing pressure, particularly annual grasses of Eurasian ancestry, such as bromes (*Bromus* spp.), oats (*Avena* spp.), and barley (*Hordeum* spp.) have mostly displaced the native grasses, creating a non-native annual grassland community. Grasslands within the County are an example of how livestock grazing and other man-induced activities can greatly change the vegetative composition of the landscape.

Grasslands in the County have been grazed by livestock over the past two centuries. Such grasslands provide habitat for common, graniverous (seed-eating) birds such as mourning dove (*Zenaida macroura*), house finch (*Carpodacus mexicanus*), savannah sparrow (*Passerculus sandwichensis*), and lesser goldfinch (*Carduelis psaltria*). These grasslands also provide habitat for common insectivorous birds such as western meadowlark (*Sturnella neglecta*), western bluebird (*Sialia mexicana*), Say's phoebe (*Sayornis saya*), American pipit (*Anthus rubescens*), and northern mockingbird (*Mimus polyglottos*), among others. Other common animals that occur in grassland habitats include California ground squirrel (*Spermophilus beecheyi*), black-tailed hare (*Lepus californicus*), brush rabbit (*Sylvilagus bachmani*), Botta's pocket gopher (*Thomomys bottae*), California meadow vole (*Microtus californicus*), western harvest mouse (*Reithrodontomys megalotis*), and raptors such as American kestrel (*Falco sparverius*) and red-tailed hawk (*Buteo jamaicensis*), which prey on the smaller birds and mammals. Oak trees scattered in the grassland community provide perching opportunities and vantage points for raptors in search of their prey. Larger mammals such as coyote (*Canis latrans*), European red fox (*Vulpes vulpes*), striped skunk, and Virginia opossum, are common or can be expected to be in grasslands within the County.

Chaparral

There are many different chaparral communities within Calaveras County. Chaparral is a one to two layer community characterized by a dominance of drought-adapted sclerophyllous (having thick, leathery

leaves), evergreen shrubs approximately six to thirteen feet tall (Holland 1986). Common dominant shrub species for this community type include chamise (*Adenostoma fasciculatum*), toyon (*Heteromeles arbutifolia*), black sage (*Salvia mellifera*), different species of manzanita (e.g., *Arctostaphylos patula* and *Arctostaphylos viscida*), and ceanothus (e.g., *Ceanothus cuneatus* and *Ceanothus integerrimus*). Scrub oaks (e.g., *Quercus dumosa* and *Quercus garryana*) and California huckleberry (*Vaccinium ovatum*) are also likely in this community within the County. These shrubs often form a dense, impenetrable thicket with their overlapping canopies that can shade out herbaceous species. The herbaceous understory, if present, varies both seasonally and annually. This community is adapted to fire and many of its species are capable of stump sprouting and the mix of annual grasses and forbs change from year to year especially after a fire event. This plant community is well distributed from northwestern Baja to southern Oregon on shallow, rocky soils.

Common types of chaparral that occur within the County include chamise chaparral which is dominated by chamise (*Adenostoma fasciculatum*); buckbrush chaparral which is dominated by buckbrush (*Ceanothus cuneatus*); and, northern mixed chaparral which is dominated by a mix of manzanita (*Arctostaphylos* spp.) and ceanothus species. Ione chaparral, while narrowly restricted in the County, provides habitat for several federal and state listed plant species.

Ione chaparral is a plant community restricted to the coarse, very acidic, nutrient-poor soils of the Ione Formation. This geologic formation occurs in central portions of Butte and Yuba Counties, the western portions of Nevada, Placer, El Dorado, Amador and Calaveras Counties. It extends as far south as Madera County. These acidic, nutrient-poor soils are incompatible with most vegetation, not only because of their low macronutrients such as calcium, nitrogen, and magnesium but also because of their high amounts of other elements that most plants find toxic, such as. A number of plant species uniquely adapted to Ione Formation soils occur in this plant community, and are classified as special-status plants. Ione manzanita (*Arctostaphylos myrtifolia*), a federally listed threatened species, is the dominant species of Ione chaparral, where it occurs in dense stands. Four other special-status plant species are associated with Ione chaparral: Parry horkelia (*Horkelia parryi*) (CNPS Rank 1B), Ione buckwheat (*Eriogonum apricum* var. apricum) (federal and state listed endangered; CNPS Rank 1B), Irish Hill buckwheat (Eriogonum apricum var. prostratum) (federal and state listed endangered; CNPS Rank 1B), and Bisbee Peak rush-rose (*Helianthemum suffrutescens*) (CNPS Rank 3). Other species associated with this plant community include white-leaf manzanita (*Arctostaphylos viscida*), interior live oak (*Quercus wislizenii*), scrub oak (*Quercus berberidifolia*), chamise, coyote brush (*Baccharis pilularis*), California yerba santa (*Eriodictyon californicum*), toyon (*Heteromeles arbutifolia*) and hoary coffeeberry (*Frangula californica tomentella*).

Many wildlife species travel over and through the chaparral on their way to other habitats. Only a few call it home year-round. Those birds, mammals, and reptiles that are resident in chaparral (that is, den, nest, and forage in the chaparral) include California thrasher (*Toxostoma redivivum*), wrentit (*Chamaea fasciata*), spotted towhee (*Pipilo maculatus*), California quail (*Callipepla californica*), Bewick's wren (*Thryomanes bewickii*), brush rabbit, Botta's pocket gopher, California mouse (*Peromyscus californicus*), striped racer (*Masticophis lateralis*), western fence lizard (*Sceloporus occidentalis*), and western rattlesnake (*Crotalus viridis*).

Conifer Forest Communities

Several different coniferous trees (that is, needle-leaved or scale-leaved trees that bear cones) are present within the County. These communities can be broken down into two separate communities based on elevation. These two communities are: (1) upper montane mixed coniferous forest, and (2) lower montane mixed coniferous forest. These two classifications include the Holland (1986) community types: Westside ponderosa pine forest, Sierran mixed conifer forest, Sierran white fir forest, and big tree forest in the lower montane zone; and, in the upper montane zone includes Jeffery pine forest, Jeffery pine-fir forest, and red fir forest. Mixed conifer forest, upper and lower montane, forms the dominant vegetation type at elevations above 2,500 feet; this covers the eastern half of the County.

- Lower Montane Mixed Conifer Forest – Lower montane vegetation is dominated by forests. These forests are often classified in varied ways but most broadly referred to as Sierra mixed-conifer forests. The dominant tree species, including ponderosa pine (*Pinus ponderosa*), Douglas fir (*Pseudotsuga menziesii*), and white fir (*Abies concolor*), have broadly overlapping distributions. In the GPA all three of these dominant tree species are present. Ponderosa pine and other mixed conifer trees dominate much of the lower montane zone. At the lowest margins ponderosa pine forest intermingles with chaparral. Stands of black oak or individuals of ponderosa pine and incense cedar may occur well down into chaparral or foothill woodlands on favorable sites, often deeper soils or drainages. Ponderosa pine or Douglas fir often occur interspersed with canyon live oak as individual or small stands where soils are deeper. The giant sequoia (*Sequoia giganteum*) groves of the central and southern Sierra Nevada (also commonly referred to as "big tree forests") present a special case of mixed-conifer forests. These groves are typically dominated by white fir, or at higher elevations by red fir, with sugar pine (Pinus lambertiana) as an important component (Barbour et al 2007). Giant sequoias are commonly third in abundance in these groves, although their basal area often exceeds that of other species (op. cit.). There is one occurrence of giant sequoia grove/big tree forest in Calaveras County, the North Calaveras Grove in the Calaveras Big Trees State Park.
- Upper Montane Mixed Conifer Forest – Upper montane vegetation types grow at elevations above white fir and mixed-conifer series of the Sierra Nevada. The elevation of this transition from lower montane forests occurs at about 1,800 meters (5,905 feet) above sea level in the central and northern Sierra Nevada. In addition to coniferous forests, montane meadows, aspen, montane chaparral, and non-forested rock outcrops are prevalent in this zone. There are three major community types of distinctive conifer composition that form the upper montane forests. These are red fir forests, lodgepole pine forests, and Jeffrey pine forests. Coniferous forests are densely wooded habitats that provide wildlife with nesting opportunities, denning opportunities, cones and seeds for foraging, and bark, leaf duff, and fallen logs to support and recruit insect populations which in turn provide food for reptiles, amphibians, birds, and mammals. Examples of wildlife expected in the GPA's coniferous forest habitats are Northern goshawk (*Accipiter gentilis*), common raven (*Corvus corax*), Steller's jay (*Cyanocitta stelleri*), northern flicker (*Colaptes auratus*), pileated woodpecker (*Dryocopus pileatus*), white-headed woodpecker (*Picoides albolarvatus*), downy woodpecker (Picoides pubescens), Clark's nutcracker (*Nucifraga columbiana*), varied thrush (*Ixoreus naevius*), American robin (*Turdus migratorius*), purple finch (*Carpodacus purpureus*), mountain chickadee (*Poecile gambeli*), brown creeper (*Certhia americana*), black bear (*Ursus americanus*), mule deer (*Odocoileus hemionus*), and mountain lion (*Felis concolor*). Examples of Neotropical migrant birds likely to be found in coniferous forests include

olive-sided flycatcher (*Contopus cooperi*), Pacific-slope flycatcher (*Empidonax difficilis*), and western wood-pewee (*Contopus sordidulus*).

Hardwood Forest and Woodland Communities

Hardwood forests and woodlands are dominated by evergreen tree species (such as evergreen oaks (*Quercus* spp.) and madrone (*Arbutus menziesii*)) and broad-leaved deciduous trees (such as some species of oaks, maples (*Acer macrophyllum*) and alders (*Alnus* spp.). Coniferous trees (such as firs and pines) may also be present. Hardwood forests in the GPA include montane hardwood and montane hardwood-conifer forests along the drainages of major rivers and aspen (*Populus tremuloides*) forests at high elevations. Examples of montane hardwood and hardwood-conifer forests found within the County are madrone forest and McNab cypress woodland. Examples of woodland communities present in the County are foothill woodland, valley oak woodland, and riparian woodland.

Seasonal Wetlands

Seasonal wetlands are habitats that may appear dry in the summer and fall months but with fall and winter rains become saturated or inundated, often remaining inundated for a period of several weeks to months each year. These wetlands are characterized by hydric soils and confining topography such as topographic low areas or any low area that was inadvertently created through man's activities. Hydric soils are soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic (absence of free oxygen) conditions within the upper part of the soil profile. After saturation/inundation and desaturation, redoximorphic features form in many soil profiles from the reduction and oxidation of iron and manganese compounds in the soil. Hydric soils frequently have a high clay content with low permeability, or may exhibit hardpans and/or cemented durapans in subsoil layers. Such soils when contained within depressional topography may perch water near or at the surface creating wetland hydrology. Such areas eventually colonize and become dominated by seasonal wetland plants, and thus persist as seasonal wetlands.

Seasonal wetlands provide important functions including ground water recharge and discharge, pollutant filtration, and serve as an aquatic habitat for a variety of wildlife species ranging from invertebrates and insects to amphibians, reptiles, birds, and mammals. Seasonal wetlands in the County support cosmopolitan wetland species such as umbrella sedge (*Cyperus eragrostis*), hyssop loose strife (*Lythrum hyssopifolium*), curly dock (*Rumex crispus*), and rabbit's foot grass (*Polypogon monspilensis*) among many others.

Seasonal wetlands provide a seasonal water source for wildlife. Typically, seasonal wetlands remain saturated or inundated through March, or in an above normal rainfall year, may stay inundated as late as mid-May or even to June. This inundation period allows many amphibian and invertebrate species the opportunity to lay their eggs, hatch, and develop to metamorphosis. Western toads (*Bufo boreas*) and Sierran tree frogs (*Pseudacris sierra*), and at lower elevations in the County, the federal and state listed California tiger salamander (*Ambystoma californiense*) can occur in these habitats. Also invertebrates such as may flies (*Ephemeroptera*), damselflies (*Odonata*), backswimmers (*Notonectidae* and *Corixidae*), water striders (*Gerridae*), and predaceous diving beetles (*Dytiscidae*) are common in seasonal wetlands. Wading birds such as great egrets (*Ardea alba*), great blue herons (*Ardea herodias*), and greater yellow legs (*Tringa melanoleuca*), among others can frequently be observed foraging at seasonal wetland habitats. Mammals

such as coyotes, raccoons, striped skunks can be observed at wetlands (or their tracks, scat or other sign) drinking the water and/or foraging for food.

Stream Channels and Drainages – Riparian Woodland

Calaveras County is bounded by the Mokelumne River to the north and the Stanislaus River to the south. In addition to these two major rivers that flow along the edges of the County, a number of perennial to intermittent streams flow through the County. Some examples are Calaveras Creek, Littlejohns Creek, and Cosgrove Creek among many others. Many of these rivers and streams support riparian vegetation (pertaining to the terrestrial, moist soil zone immediately landward of aquatic wetlands, other freshwater bodies, both perennial and intermittent watercourses, and many estuaries). Riparian woodlands are rich habitats, supporting numerous plant species that can include trees, shrubs, vines, and annual and perennial herbs. This variety of plants provides a complex vegetative structure, which in turn supports a diversity of wildlife species. Riparian woodland is associated with many of the creeks and drainages within the County.

Tree species found in this plant community within the County vary depending upon the elevation and location within the County. Riparian tree species include big leaf maple (*Acer macrophyllum*), California buckeye (*Aesculus californica*), arroyo willow (*Salix lasiolepis*), black willow (*Salix gooddingii*), Oregon ash (*Fraxinus latifolia*), white alder (*Alnus rhombifolia*), and black cottonwood (*Populus nigra*). Riparian woodlands typically have a shrubby and herbaceous understory with shrubs such as poison oak (*Toxicodendron diversilobum*), snowberry *(Symphoricarpos albus* var. *laevigatus*), non-native Himalayan blackberry (*Rubus discolor*), and native California blackberry (*Rubus ursinus*), and herbs such as California bee plant (*Scrophularia californica*) and seep monkey flower (*Mimulus guttatus*) and vines such as clematis (*Clematis ligusticifolia*) and pipevine (*Aristolochia californica*).

Drainages within the County provide a water source for birds, mammals, amphibians, and reptiles, as well as providing breeding habitat for common amphibian species such as Sierran tree frog, western toad, and California newt (*Taricha torosa*). Within the Draft General Plan area, a myriad of invertebrates and insects complete their life cycle in drainages as well. Mallards (*Anas platyrhynchos*), raccoons, mule deer, and opossums all can be expected to be found using such drainages. The vegetation and sap of willow trees typically attracts numerous insects to their branches. These insects, in turn, attract common insectivorous bird species such as ruby-crowned kinglet (*Regulus calendula*), bushtit (*Psaltriparus minimus*), yellow-rumped warbler (*Dendroica coronata*), and less common species such as Neotropical migrants like the yellow warbler (*Dendroica petechia*) and yellow-breasted chat (*Icteria virens*), among others.

Pond and Lakes

Ponds and lakes are inland bodies of water that vary in size from small stock ponds and natural seeps/ponds to large constructed reservoirs such as New Melones Lake and New Hogan Reservoir. Emergent vegetation such as cattails (*Typha angustifolia* and *T. latifolia*) and rushes (*Bolboschoenus* spp., *Schoenoplectus* spp., and *Juncus* spp.) can be found along the margins of these aquatic habitats. Floating vegetation such as water starwort (*Callitriche* spp.), duck weed (*Lemna* spp.) and buttercup (*Ranunculus aquatilis*) can be found on the water's surface. These floating plants provide food for herbivorous waterfowl such as the mallard (*Anas platyrhynchos*) which is a common duck species in urban and rural settings. Ponds, lakes, and reservoirs provide wildlife with a permanent to near permanent source of water (depending on whether

the smaller waterbody dries down in the summer months). Many amphibians depend on water, at least seasonally, to complete their life cycle. The Sierran tree frog, western toad, and the federal and state listed California tiger salamander are all amphibian species known to occur in these habitats within the County.

Natural and Beneficial Functions

Wetlands (the three previously mentioned land use types – wetlands, riparian woodlands, and ponds and lakes) perform a variety of ecosystem functions including food web support, habitat for insects and other invertebrates, fish and wildlife habitat, filtering of waterborne and dry-deposited anthropogenic pollutants, carbon storage, water flow regulation (e.g., flood abatement), groundwater recharge, and other human and economic benefits.

Wetlands provide habitat for insects and other invertebrates that are critical food sources to a variety of wildlife species, particularly birds. There are species that depend on wetlands during all parts of their lifecycle for food, overwintering, and reproductive habitat. Other species use wetlands for one or two specific functions or parts of the lifecycle, most commonly for food resources. In addition, wetlands produce substantial plant growth that serves as a food source to herbivores (wild and domesticated) and a secondary food source to carnivores.

Wetlands slow the flow of water through the vegetation and soil, and pollutants are often held in the soil. In addition, because the water is slowed, sediments tend to fall out, thus improving water quality and reducing turbidity downstream.

Critical Species

To further understand natural resources that may be particularly vulnerable to a hazard event, as well as those that need consideration when implementing mitigation activities, it is important to identify at-risk species (i.e., endangered species) in the planning area. An endangered species is any species of fish, plant life, or wildlife that is in danger of extinction throughout all or most of its range. A threatened species is a species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Both endangered and threatened species are protected by law and any future hazard mitigation projects are subject to these laws. Candidate species are plants and animals that have been proposed as endangered or threatened but are not currently listed.

There are many federal endangered, threatened, or candidate species in Calaveras County. These species are listed in Table 4-32.

Table 4-32 Calaveras County Critical Species

Latin Name	Common Name	Status
Invertebrates		
Branchinecta conservatio	Conservancy fairy shrimp	E
Branchinecta lynchi	vernal pool fairy shrimp	T
–	Critical habitat, vernal pool fairy shrimp	
Desmocerus californicus dimorphus	valley elderberry longhorn beetle	T

Latin Name	Common Name	Status
Lepidurus packardi	vernal pool tadpole shrimp	E
Fish		
Hypomesus transpacificus	Delta smelt	T
Oncorhynchus mykiss	Central Valley steelhead	T
–	Critical habitat, Central Valley steelhead	X
Oncorhynchus tshawytscha	winter-run chinook salmon, Sacramento River	E
–	Critical habitat, winter-run chinook salmon, Sacramento River	E
Amphibians		
Ambystoma californiense	California tiger salamander, central population	T
–	Critical habitat, CA tiger salamander, central population	X
Rana aurora draytonii	California red-legged frog	T
–	Critical habitat, California red-legged frog	X
Rana sierrae	Mountain yellow legged frog	PX
Reptiles		
Thamnophis gigas	giant garter snake	T
Mammals		
Vulpes macrotis mutica	San Joaquin kit fox	E
Plants		
Arctostaphylos myrtifolia	Ione manzanita	T
Brodiaea pallida	Chinese Camp brodiaea	T
–	Critical habitat, succulent (=fleshy) owl's-clover	X
–	Critical habitat, Hoover's spurge	X
Neostapfia colusana	Colusa grass	T
–	Critical habitat, Colusa grass	X
Pseudobahia bahiifolia	Hartweg's golden sunburst	E
–	Critical habitat, Greene's tuctoria	X
Verbena californica	Red Hills (=California) vervain	T
Candidate Species for Endangered or Threatened Listing		
Bufo canorus	Yosemite toad	C
Rana muscosa	Mountain yellow-legged frog	C
Martes pennanti	fisher	C

Source: US Fish and Wildlife Service, http://www.fws.gov/sacramento/es_species/Lists/es_species_lists.cfm
Key:
(E) Endangered – Listed as being in danger of extinction.
(T) Threatened – Listed as likely to become endangered within the foreseeable future.
(C) Candidate – Candidate to become a proposed species.
(X) Critical Habitat designated for this species
(PX) Proposed Critical Habitat for this species.

Historic and Cultural Assets

Calaveras County has a large stock of historically significant homes, public buildings, and landmarks. To inventory these resources, the HMPC collected information from a number of sources. The California Department of Parks and Recreation Office of Historic Preservation (OHP) was the primary source of information. The OHP is responsible for the administration of federally and state mandated historic preservation programs to further the identification, evaluation, registration, and protection of California's irreplaceable archaeological and historical resources. OHP administers the National Register of Historic Places, the California Register of Historical Resources, California Historical Landmarks, and the California Points of Historical Interest programs. Each program has different eligibility criteria and procedural requirements.

- The **National Register of Historic Places** is the nation's official list of cultural resources worthy of preservation. The National Register is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect historic and archeological resources. Properties listed include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archeology, engineering, and culture. The National Register is administered by the National Park Service, which is part of the U.S. Department of the Interior.
- The **California Register of Historical Resources** program encourages public recognition and protection of resources of architectural, historical, archeological, and cultural significance and identifies historical resources for state and local planning purposes; determines eligibility for state historic preservation grant funding; and affords certain protections under the California Environmental Quality Act. The Register is the authoritative guide to the state's significant historical and archeological resources.
- **California Historical Landmarks** are sites, buildings, features, or events that are of statewide significance and have anthropological, cultural, military, political, architectural, economic, scientific or technical, religious, experimental, or other value. Landmarks #770 and above are automatically listed in the California Register of Historical Resources.
- **California Points of Historical Interest** are sites, buildings, features, or events that are of local (city or county) significance and have anthropological, cultural, military, political, architectural, economic, scientific or technical, religious, experimental, or other value. Points designated after December 1997 and recommended by the State Historical Resources Commission are also listed in the California Register.

Historical resources included in the programs above are identified in Table 4-33.

Table 4-33 Calaveras County – OHP Historical Resources

Name/Landmark Plaque Number	National Register	State Landmark	California Register	Point of Interest	Date Listed	Town
Altaville (288)		X			2/4/1938	Altaville
Altaville Grammar School (N795)	X				8/24/1979	Altaville
Angels Camp (287)		X			2/4/1938	Angels Camp
Angels Hotel (734)	X	X			4/8/1960	Angels Camp

Name/Landmark Plaque Number	National Register	State Landmark	California Register	Point of Interest	Date Listed	Town
Avery Hotel-Halfway House (P602)				X	12/31/1982	Avery
Birthplace Of Archie Stevenot (769)		X			12/1/1961	Angels Camp
Calaveras County Bank (N1366)	X				8/1/1985	Angels Camp
Calaveras County Courthouse (N159)	X				2/28/1972	San Andreas
Calaveritas (255)		X			9/3/1937	San Andreas
California Caverns At Cave City (956)		X			5/18/1983	San Andreas)
Camanche (254)		X			9/3/1937	Burson
Campo Seco (257)		X			9/3/1937	Campo Seco
Carson Hill (274)		X			10/6/1937	Angels Camp
Chili Gulch (265)		X			9/3/1937	Mokelumne Hill
Choy, Sam, Brick Store (N1309)	X				9/20/1984	Angels Camp
Congregational Church (261)		X			9/3/1937	Mokelumne Hill
Copperopolis (296)		X			9/19/1938	Copperopolis
Copperopolis Armory (N1999)	X				12/30/1997	Copperopolis
Copperopolis Congregational Church (N2000)	X				12/30/1997	Copperopolis
Courthouse Of Calaveras County, 1852-1866, And Leger Hotel (663)		X			11/5/1958	Mokelumne Hill
Dorrington Hotel And Restaurant (P787)				X	8/16/1993	Dorrington
Double Springs (264)		X			9/3/1937	Valley Springs
Douglas Flat (272)		X			10/6/1937	Douglas Flat
Douglas Flat School (N237)	X				5/24/1973	Douglas Flat
El Dorado (282)		X			1/8/1938	Mountain Ranch
Fourth Crossing (258)		X			9/3/1937	San Andreas
Glencoe (Mosquito Gulch) (280)		X			1/8/1938	Glencoe
Honigsberger Store (N1762)	X				4/2/1992	Copperopolis

Name/Landmark Plaque Number	National Register	State Landmark	California Register	Point of Interest	Date Listed	Town
I.O.O.F. Hall, Mokelumne Hill (256)		X			9/3/1937	Mokelumne
Jenny Lind (266)		X			9/3/1937	Valley Springs
Jesus Maria (284)		X			1/8/1938	Mokelumne Hill
Mercer Caverns (The New Calaveras Cave) (P662)				X	8/20/1985	Murphys
Milton (262)		X			9/3/1937	Milton
Mitchler Hotel (267)		X			9/3/1937	Murphys
Mokelumne Hill (269)		X			9/3/1937	Mokelumne Hill
Murphys (275)		X			10/6/1937	Murphys
Murphys Grammar School (P44)	X			X	9/22/1967	Murphys
Murphys Hotel (N139)	X				11/23/1971	Murphys
O'byrne Ferry (281)		X			1/8/1938	Copperopolis
Old Mining Camp Of Brownsville (465)		X			8/30/1950	Murphys
Paloma (295)		X			9/19/1938	Mokelumne Hill
Peter L. Traver Building (466)		X			8/30/1950	Murphys
Pioneer Cemetery (271)		X			9/3/1937	San Andreas
Prince-Garibardi Building (735)		X			4/8/1960	Altaville
Rail Road Flat (286)		X			1/8/1938	Rail Road Flat
Red Brick Grammar School (499)		X			12/4/1951	Altaville
Reed's Store (N1763)	X				4/2/1992	Copperopolis
Robinson's Ferry (276)		X			10/6/1937	Angels Camp
San Andreas (252)		X			9/3/1937	San Andreas
Sandy Gulch (253)		X			9/3/1937	West Point
Stone Corral (263)		X			9/3/1937	Valley Springs
Synder, John J., House (N1298)	X				8/2/1984	San Andreas
Telegraph City Site, Napoleon And Quail Hill Mines (P1)				X	7/28/1966	Copperopolis
Thorn House (N151)	X				2/23/1972	San Andreas

Name/Landmark Plaque Number	National Register	State Landmark	California Register	Point of Interest	Date Listed	Town
Utica Mansion (N1290)	X				5/31/1984	Angels Camp
Vallecito (273)		X			10/6/1937	Vallecito
Vallecito Bell Monument (370)		X			4/3/1940	Vallecito
Valley Springs (251)		X			9/3/1937	Valley Springs
West Point (268)		X			9/3/1937	West Point

Source: California Office of Historic Preservation

It should be noted that as defined by the National Environmental Policy Act (NEPA), any property over 50 years of age is considered a historic resource and is potentially eligible for the National Register. Thus, in the event that the property is to be altered, or has been altered, as the result of a major federal action, the property must be evaluated under the guidelines set forth by NEPA. Structural mitigation projects are considered alterations for the purpose of this regulation.

Growth and Development Trends

As part of the planning process, the HMPC looked at changes in growth and development, both past and future, and examined these changes in the context of hazard-prone areas, and how the changes in growth and development affect loss estimates and vulnerability. Information from the 2014-2022 Calaveras County Housing Element and the California Department of Finance (DOF) form the basis of this discussion. More specific information on growth and development in Angels Camp can be found in its jurisdictional annexes.

Current Status and Past Development

Table 4-34 shows population growth in Calaveras County and California since 1920. Calaveras is ranked 44th out of 58 California Counties by population size in 2010; however, it grew rapidly in the 1970s and 1980s. Between 1970 and 1980, the average annual growth rate (AAGR) for Calaveras County was 4.3 percent. Between 1980 and 1990, the County added residents even more quickly (an average of 4.4 percent per year). From 1990 to 2000, growth slowed to an AAGR of 2.4 percent. For the most recent period from 2000 to 2010, the population AAGR was 1.2 percent, much slower than the rate of growth seen in previous decades. The 2014 population of the County according to the California DOF was 45,079.

Table 4-34 Calaveras County Historical and Current Population

Year	Population	Change	AAGR
1920	6,183	–	–
1930	6,008	-175	-0.3%
1940	8,221	2,213	3.2%
1950	9,902	1,681	1.9%
1960	10,289	387	0.4%
1970	13,585	3,296	2.8%

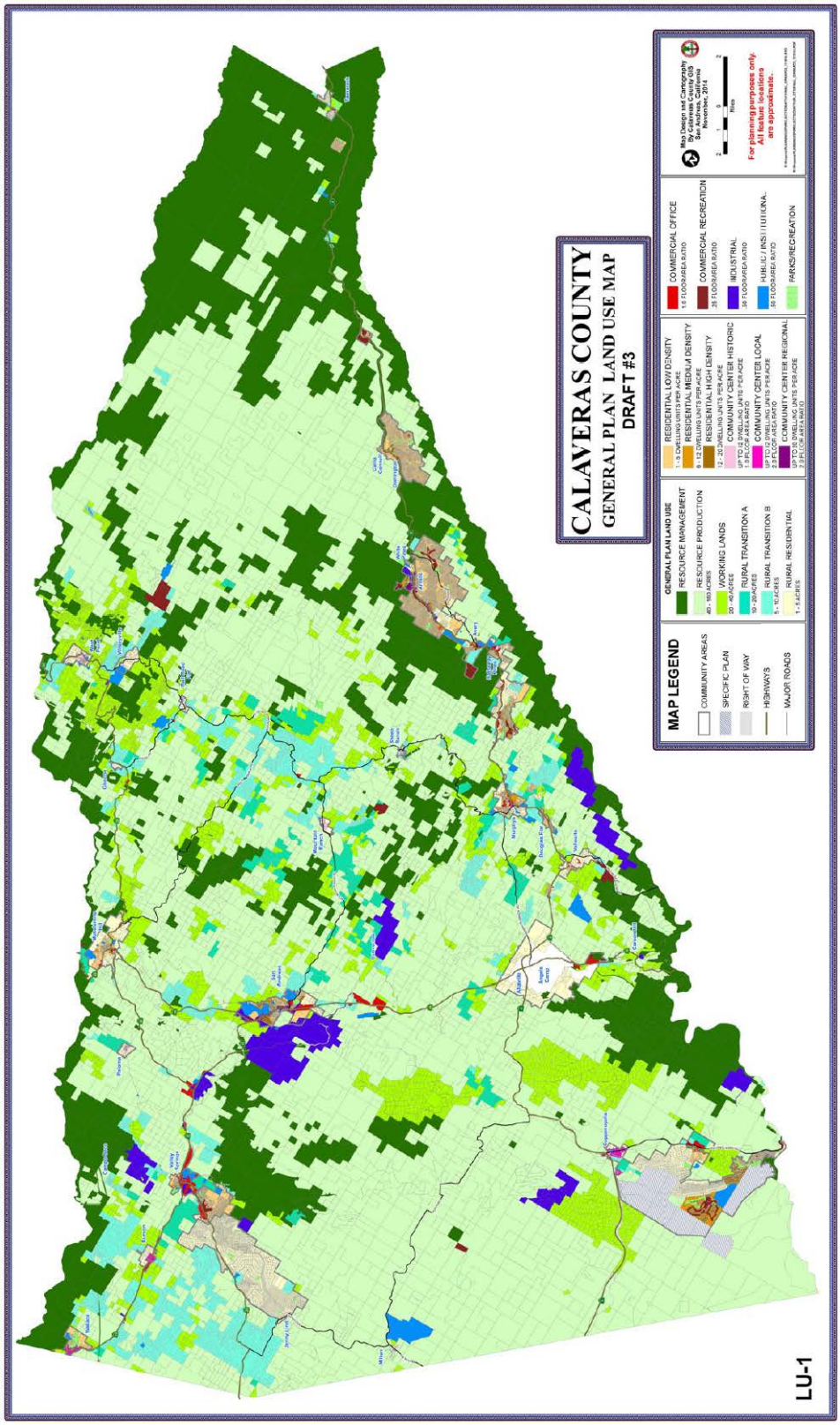
Year	Population	Change	AAGR
1980	20,710	7,125	4.3%
1990	31,998	11,288	4.4%
2000	40,554	8,556	2.4%
2010	45,578	5,024	1.2%

Source: Calaveras County Draft General Plan Housing Element 2014-2022

Land Use

Future land use and growth management strategies in Calaveras County aim to concentrate future development into and toward existing communities away from locations where natural characteristics may limit development (e.g., steep slopes or sensitive habitats), and to areas that have, or can readily be supplied with, adequate public facilities and services. This is done through various policies relating to zoning and minimum development standards and requirements. Zoning designations prescribe allowed land uses and minimum lot sizes for the purpose of supporting efficient infrastructure design, conservation of natural resources, and to avoid conflicting uses. Figure 4-41, from the Draft 2014 Calaveras County General Plan, shows current land use designations in unincorporated Calaveras County.

Figure 4-41 Calaveras County Land Use Map



Source: Calaveras County 2014 Draft General Plan Land Use Element

Development since 2010 Plan

No development since the 2010 Plan has taken place within a 100-year floodplain (FEMA SFHA, Zone A or Zone AE.)

Future Development

The California DOF produces population projections for all counties in California, including Calaveras County. These projections were included in the 2014-2022 Calaveras County Housing Element. Table 4-35 shows the DOF population estimate in 2014 and the projected population for 2015 through 2035, as well as the AAGR for each time period. As shown in the table, Calaveras County's population is projected to increase from 44,650 in 2014 to 54,912 in 2035. Growth rates in the region appear to be declining.

Table 4-35 Population Projections in Calaveras County – 2014 to 2035*

	Calaveras County	
Year	Persons*	AAGR
2014	44,650	-0.7%
2015**	45,923	0.1%
2020	48,957	1.3%
2025	51,415	1.0%
2030	53,317	0.7%
2035	54,912	0.6%

Source: 2014 Data from DOF Table E-1 City/County Population Estimates w/Annual Percentage Change; January 1, 2013 and 2014. Data for 2015-2035 DOF Report P-1 (Total Population) State and County Population Projects July 1, 2010-2060 (5-year increments); 12/15/2014.
*Includes City of Angels Camp
**Projections commencing in 2015 for DOF Report P-1 are based on a DOF 2010 County and State population estimate of 45,654 and 37,341,978 respectively (and not on 2014 estimates).

Future Growth Areas

GIS shapefiles of future growth areas were provided by the County. These areas are shown in Figure 4-42 and Table 4-36.

Figure 4-42 Calaveras County Future Growth Areas

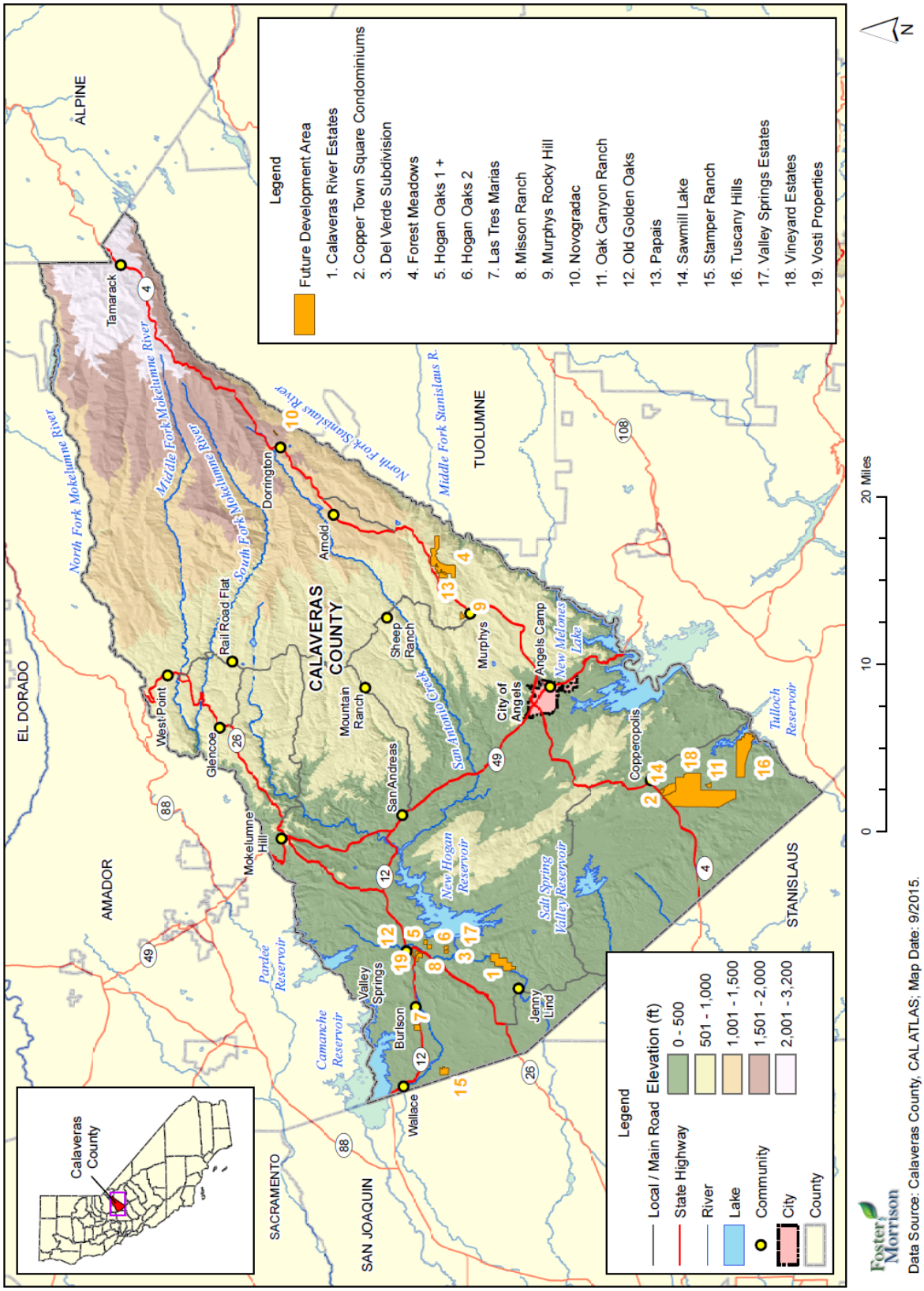


Table 4-36 Calaveras County Future Growth Areas

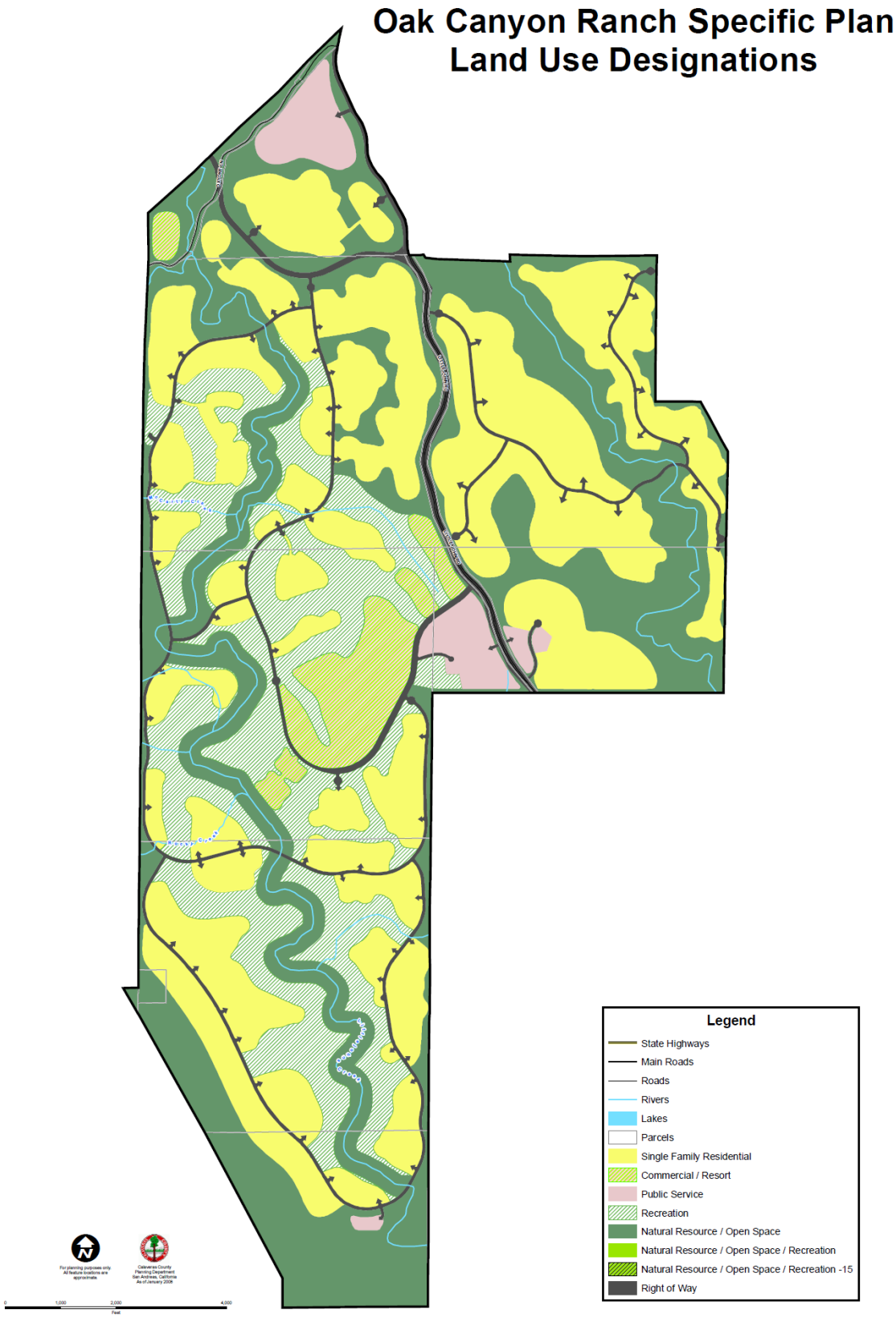
Development	# of Units	# of Parcels	Project Date	Acres
Calaveras River Estates	2	2	2006	494
Copper Town Square Condominiums	28	28	-	27
Del Verde Subdivision	1	1	2005	40
Forest Meadows	837	835	-	853
Hogan Oaks 1 +	1	1	2002	37
Hogan Oaks 2	1	1	2011	45
Las Tres Marias	1	1	2004	79
Misson Ranch	2	2	2006	81
Murphys Rocky Hill	2	2	2007	47
Novogradac	2	2	2003	14
Oak Canyon Ranch	19	17	2000	3,242
Old Golden Oaks	1	1	2006	28
Papais	4	4	2014	37
Sawmill Lake	9	9	-	254
Stamper Ranch	1	1	2003	133
Tuscany Hills	1	1	2001	1,096
Valley Springs Estates	1	1	1989	31
Vineyard Estates	1	1	2008	40
Vosti Properties	1	1	-	30
Total	**915**	**911**		**6,609**

Source: Calaveras County GIS

In addition, there are two areas in the County that are intended for development under a Specific Plan. A "Specific Plan" is defined in the California Government Code (Section 65450 et seq) as a legal tool for detailed design and implementation of a defined portion of the area covered by a General Plan. A Specific Plan includes detailed regulations, conditions, programs, and/or proposed legislation that are needed to implement General Plan designations and policies on a particular site. These two specific plan areas are the Oak Canyon Ranch and Saddle Creek Resort.

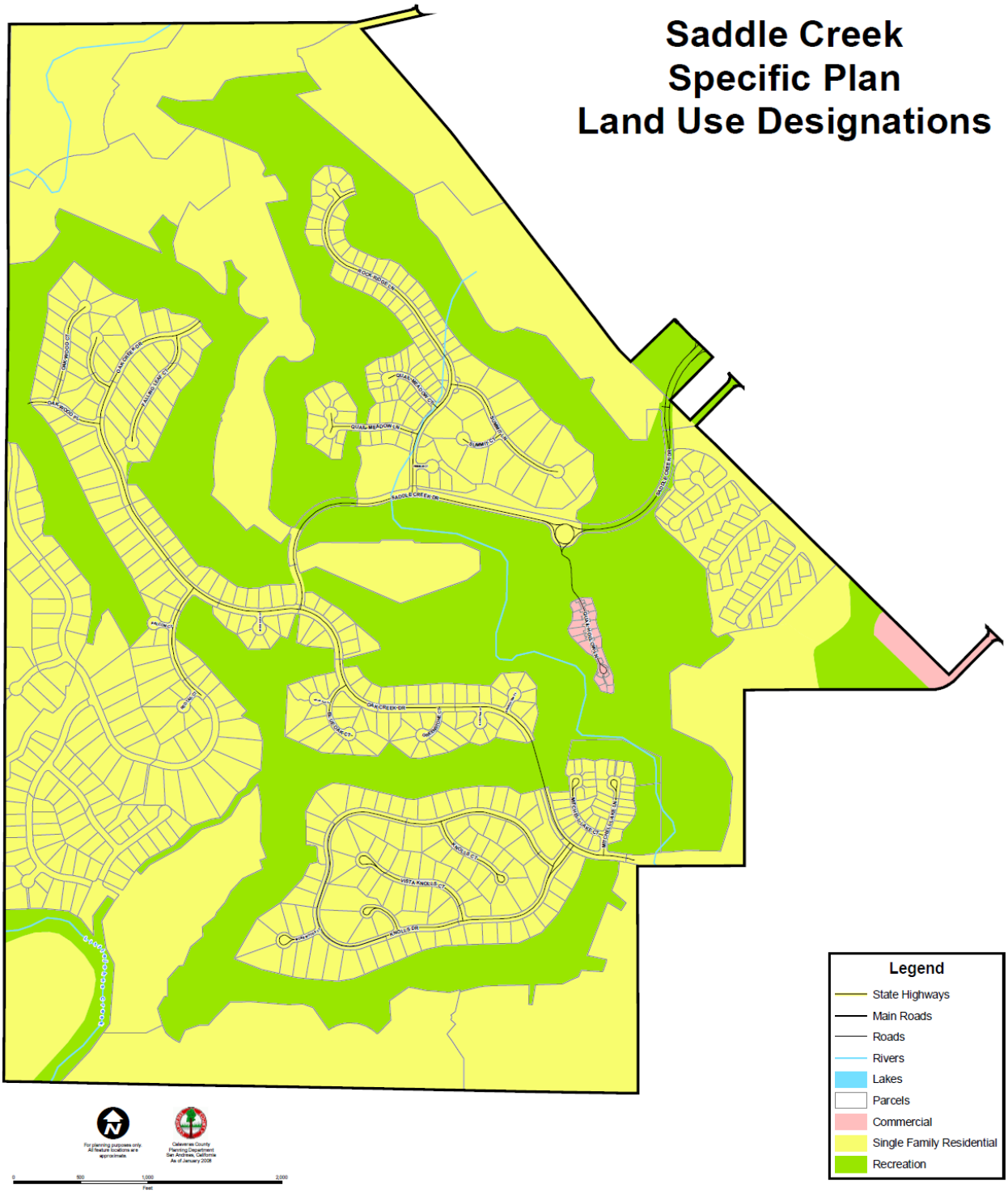
- **Oak Canyon Ranch Specific Plan**. The County approved the Oak Canyon Ranch Specific Plan on December 18, 2001. The Specific Plan covers 3,214 acres and includes 2,275 proposed residential units with a village center, commercial and retail services, a resort, two golf courses, and new elementary and high schools. There are no affordable housing components or requirements in the Oak Canyon Ranch Specific Plan, the Development Agreement, or the tentative subdivision approval. To date (February 2015), the project has not started construction. Land use designations for the Oak Canyon Ranch Specific Plan are shown in Figure 4-43.

Figure 4-43 Oak Canyon Ranch Specific Plan Land Use Designations



- **Saddle Creek Resort Specific Plan (formerly Calaveras Country Club Specific Plan)**. The Saddle Creek Resort Specific Plan was originally adopted in 1993 as Calaveras Country Club. Construction began in 1994 and proceeded in phases with the construction of separate subdivisions. Quail Creek and Copper Highlands are the only remaining subdivisions with lots available for purchase. According to the Saddle Creek Resort website, these lots range in size from one-quarter to over one-acre and range in price from $65,000 to $139,000 (February, 2015). There is a Saddle Creek Community Services District that provides services and maintenance for the community's roads, storm drains, landscaping, and wildlife and wetland easements. There are no multi-family uses or affordable housing components in the Saddle Creek Specific Plan. There is a single-family high-density zoning district with a minimum lot size of 3,630 square feet intended for single-family, condo, planned unit developments, stock cooperatives, townhomes and attached single- family residences. According to the developer the project is approximately 30 percent built out with nearly 195 recorded lots remaining to be built on and an additional 1,145 already approved units pending. Land use designations for the Saddle Creek Resort Specific Plan are shown in Figure 4-44.

Figure 4-44 Saddle Creek Specific Plan Land Use Designations



Redevelopment

There has not been a significant amount of re-development within Calaveras County because of its rural nature and agricultural economy. All new development must follow the guidance of the Comprehensive Plan and must comply with all floodplain management regulations, land use regulations, and building codes.

4.3.2. Calaveras County's Vulnerability to Specific Hazards

The Disaster Mitigation Act regulations require that the HMPC evaluate the risks associated with each of the hazards identified in the planning process. This section summarizes the possible impacts and quantifies, where data permits, the County's vulnerability to each of the hazards identified as a priority hazard in Section 4.2.16 Natural Hazards Summary. The priority hazards evaluated further as part of this vulnerability assessment include:

- Agricultural Hazards
- Drought and Water Shortage
- Earthquake*
- Flood: 100-500-year
- Flood: Localized Flooding
- Severe Weather: Heavy Rain and Storms
- Severe Weather: Winter Storms and Extreme Cold
- Wildfire

*Although deemed not to be a priority hazard by the HMPC, due to its significance in California, earthquake vulnerability is included in this vulnerability assessment

An estimate of the vulnerability of the County to each identified hazard, in addition to the estimate of risk of future occurrence, is provided in each of the hazard-specific sections that follow. 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. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **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 occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

Vulnerability can be quantified in those instances where there is a known, identified hazard area, such as a mapped floodplain. In these instances, the numbers and types of buildings subject to the identified hazard can be counted and their values tabulated. Other information can be collected in regard to the hazard area, such as the location of County critical facilities, historic structures, and valued natural resources (e.g., an

identified wetland or endangered species habitat). Together, this information conveys the impact, or vulnerability, of that area to that hazard.

The HMPC identified three hazards in the planning area for which specific geographical hazard areas have been defined and for which sufficient data exists to support a quantifiable vulnerability analysis. These three hazards are earthquake (although deemed not to be a priority hazard by the HMPC, due to its significance in California, earthquake vulnerability is included in this vulnerability assessment), flood, and wildfire. Because these hazards have discrete hazard risk areas, their risk varies by jurisdiction. For earthquake, flood, and wildfire, the HMPC inventoried the following, to the extent possible, to quantify vulnerability in identified hazard areas:

- General hazard-related impacts
- Assets at risk
- Population at risk
- Critical facilities at risk
- Development trends within the identified hazard area

While dam failure does also have a quantifiable mapped hazard area, due to privacy concerns, no analysis of dam inundation was performed.

The vulnerability and potential impacts from priority hazards that do not have specific mapped areas nor the data to support additional vulnerability analysis are discussed in more general terms.

4.3.3. Agricultural Hazards Vulnerability Assessment

Likelihood of Future Occurrence—Highly likely
Vulnerability—Medium

According to the US Department of Agriculture (USDA), every year natural disasters, such as droughts, earthquakes, extreme heat and cold, floods, fires, earthquakes, hail, landslides, and tornadoes, challenge agricultural production. Because agriculture relies on the weather, climate, and water availability to thrive, it is easily impacted by natural events and disasters. Agricultural impacts from natural events and disasters most commonly include: contamination of water bodies, loss of harvest or livestock, increased susceptibility to disease, and destruction of irrigation systems and other agricultural infrastructure. These impacts can have long lasting effects on agricultural production including crops, forest growth, and arable lands, which require time to mature. Specific impacts by hazard are listed below:

- Drought's most severe effects on agriculture include water quality and quantity issues. Other impacts include decreased crop yields, impact to feed and forage, and altered plant populations.
- Earthquakes can strike without warning and cause dramatic changes to the landscape of an area that can have devastating impacts on agricultural production and the environment. These impacts could include loss of harvest or livestock and destruction of irrigation systems and other agricultural infrastructure.
- Extreme cold may result in loss of livestock, increased deicing, downed power lines, and increased use of generators. Deicing can impact agriculture by damaging local ecosystems and contaminating water

bodies. Downed power lines cause people to run generators more often, which can release harmful air pollutants.

- Hot weather and extreme heat can worsen ozone levels and air quality as well as leading to drought conditions. Excessive heat and prolonged dry or drought conditions can impact agriculture by creating worker safety issues for farm field workers, severely damaging crops, and reducing availability of water and food supply for livestock.
- Wildfires can spread quickly and devastate thousands of acres of land, which may include agricultural lands. This devastation could lead to large losses in crops, forestry, livestock, and agricultural infrastructure.
- Flooding causes many impacts to agricultural production, including water contamination, damage to crops, loss of livestock, increased susceptibility of livestock to disease, flooded farm machinery, and environmental damage to and from agricultural chemicals.
- Landslides and debris flow occur in all 50 states and commonly occur in connection with other major natural disasters such as earthquakes, volcanoes, wildfires, and floods. Some of the threats from landslides and debris flow include rapidly moving water and debris that can cause trauma; broken electrical, water, gas, and sewage lines; and disrupted roadways and railways. This can lead to agricultural impacts including contamination of water, change in vegetation, and harvest and livestock losses.
- Tornadoes can appear without much warning and have the potential to devastate an area very quickly. This devastation can impact agriculture by contaminating water and destroying crops, livestock, and other farm property.

In an effort to protect Calaveras County's $29 million agriculture industry from invasive species, the Agricultural Commissioner, working in conjunction with the United States Department of Agriculture (USDA) and the California Department of Food and Agriculture (CDFA) has implemented defensive programs targeting invasive species.

The first line of defense is an extensive program to prevent the introduction of plant, animal, insect and disease pests that may be introduced through the movement of legal and illegal trade. This program includes State/Federal inspections at shipping ports, airports and highway border stations. On the local level, the Agricultural Commissioner performs inspections at high risk shipping and receiving locations.

The second line of defense includes early detection of invasive insect species through surveillance programs conducted by the Agricultural Commissioner (see Figure 4-45). Early detection and the ability to respond rapidly are critical for preventing wide-scale invasion of many organisms. As a new invasive species spreads, the cost of control rises, the feasibility of eradication falls, and the potential for economic and environmental impacts increases.

Figure 4-45 Spraying for Noxious Weeds in Calaveras County

Source: 2011 Calaveras County Agriculture Commissioner's Crop Report

Establishment of an invasive species would be detrimental to the agricultural industry of Calaveras County because of product losses, stringent quarantine regulations, loss of exporting opportunities and increased treatment costs. The introduction of exotic plants influences wildlife by displacing forage species, modifying habitat structure—such as changing grassland to a forb-dominated community—or changing species interactions within the ecosystem. In addition, invasive plants:

- Increase wildfire potential
- Reduce water resources
- Accelerate erosion and flooding
- Threaten wildlife
- Degrade rangeland, cropland, and timberland
- Diminish outdoor recreation opportunities.

Invasive plants cost California $82 million every year (2008 Cal-EPC). Estimates on exact yearly losses in Calaveras County varies and was not available for the County. Due to the economic value of crops in the County, invasive species have the ability to cause immense financial harm.

Future Development

Future development in the County is not likely to have an impact on agricultural hazards in Calaveras County.

4.3.4. Drought and Water Storage Vulnerability Assessment

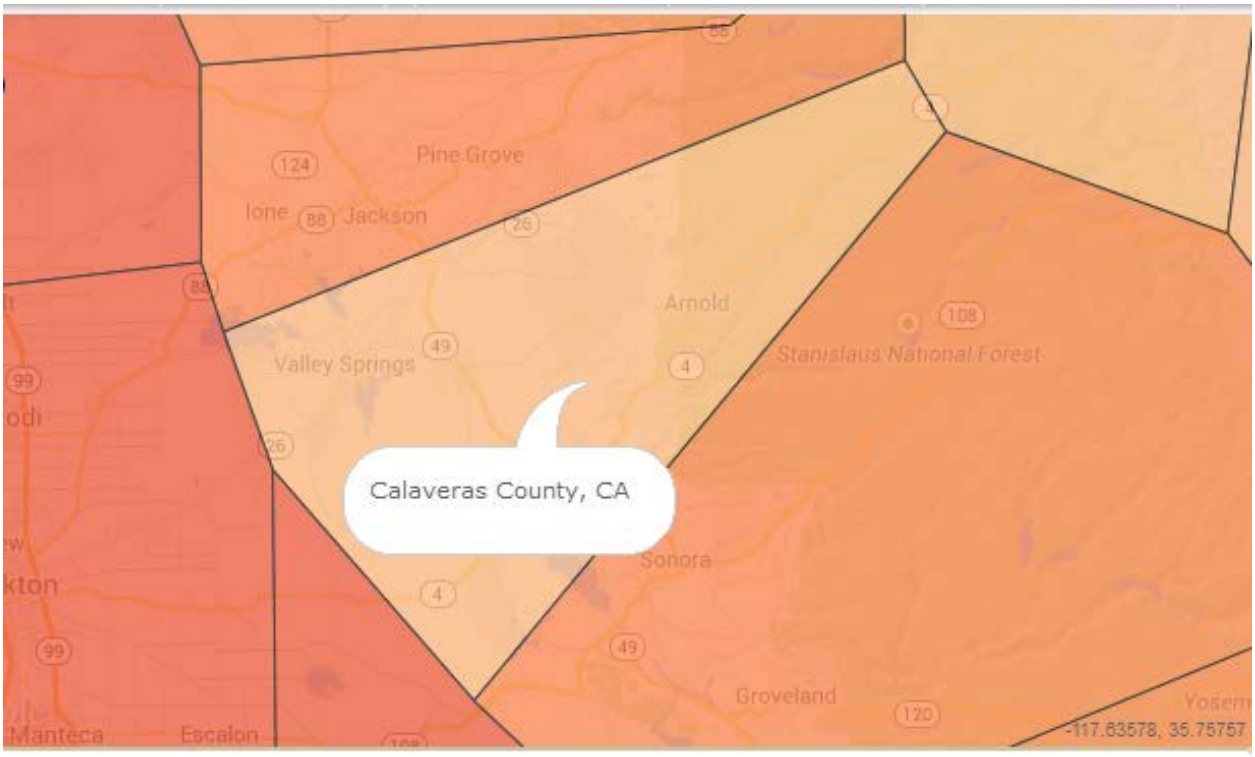
Likelihood of Future Occurrence—Likely
Vulnerability—High to Extremely High

Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate water is the most critical issue for agricultural, manufacturing, tourism, recreation, and commercial and domestic use. As the population in the area continues to grow, so too will the demand for water.

Based on historical information, the occurrence of drought in California, including Calaveras County, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts is often extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. The vulnerability of the County to drought is countywide, but impacts may vary by area and include reduction in water supply, agricultural losses, and an increase in dry fuels.

Drought impacts are wide-reaching and may be economic, environmental, and/or societal. Tracking drought impacts can be difficult. The Drought Impact Reporter from the NDMC is a useful reference tool that compiles reported drought impacts nationwide. Figure 4-46 and Table 4-37 show drought impacts for the Calaveras County planning area from 1850 to March 31, 2015. The data represented is skewed, with the majority of these impacts from records within the past ten years.

Figure 4-46 Calaveras County Planning Area Drought Impact Reporter (1850 to 2015)



Source: National Drought Mitigation Center

Table 4-37 Calaveras County Drought Impacts

Category	Number
Agriculture	169
Business and Industry	40
Energy	12
Fire	66
Plans & Wildlife	53
Relief, Response, and Restrictions	193
Society and Public Health	121
Tourism and recreation	21
Water Supply and Quality	188
Total	**488**

Source: National Drought Mitigation Center

Drought impacts to the County vary but are usually related to the reduction in flow in addition to water supply issues. The County's primary source of water supply is surface water, which is vulnerable to seasonal and climatic shortage. Historically, the Calaveras County Water District (the water agency in the County, known as the CCWD) has met a significant portion of the water needs of Calaveras County with surface water from the Mokelumne, Calaveras, and Stanislaus Rivers. CCWD has significant access to surface water from these rivers. The District does possess pre- and post-1914 water rights and agreements

to assure a long-term water supply for uses within the County. The CCWD has experienced periods when supplies were reduced and responded by passing resolutions specific to the service area prohibiting certain uses of water.

The earliest action on record in the County by the CCWD was a declared water shortage in the West Point and Copper Cove service areas in 1961, but there are no records of the amount of water supply reduction nor the cause of the shortage. In the statewide 1976-1977 drought, the CCWD restricted water use in the Copperopolis and Ebbetts Pass service areas of the County, though the amount of reduction is unknown. The CCWD adopted Ordinance 77-1 Prohibiting Nonessential Uses of Water to respond to water shortage emergencies.

In the 1987-1994, multi-county drought, water storage in New Hogan Reservoir was greatly diminished, actually falling below the minimum pool level, leading to poor quality, silty water and additional water treatment costs. Voluntary reduction measures in the Jenny Lind service area were adequate to respond to the shortage. Additional water storage at New Melones Reservoir, completed in 1979, and New Spicer Meadow Reservoir in 1990, prevented the Copperopolis and Ebbetts Pass service areas from being affected by this drought. Construction of an intertie linking the community of West Point with the Wilseyville service area, and an agreement for purchasing supplemental water with Calaveras Public Utility District using the Middle Fork of the Mokelumne River as a backup water supply source to the primary Bear Creek water source, helped ensure adequate water supply to the communities of West Point, Wilseyville, and Bummerville. In the community of Sheep Ranch, the normal San Antonio Creek water source was supplemented by releases from the Ebbetts Pass water system.

Assets at Risk

Water Producers

Drought is different than many other hazard events as it is a slow onset event unlikely to damage buildings or facilities. However, drought can be one of the most detrimental hazards to the County and one requiring the most substantive planning as local conditions change and grow. Potential costs to droughts are difficult to assess. In the past, the CCWD has borne cost themselves and not implemented any sort of surcharge to customers. Extreme heat in July 2006 led to water distribution problems similar to conditions that might occur during a drought event, including increased power and treatment expense and reduced consumptive revenue.

A limited analysis was conducted nearly a decade ago to determine the financial impacts to the CCWD during water shortages (an update to this analysis is under consideration for the next rate analysis). The analysis examines the primary impacts on a gross basis from instituting the various stages of a water conservation program. The net reduction in revenues for 20 percent, 30 percent, and 50 percent demand reduction is shown in Table 4-38. The District calculates net revenue based on consumptive revenue minus power and chemical costs.

Table 4-38 Net Revenue Impacts/Losses from Demand Reductions (2002 Dollars)

Demand type	Anticipated revenue
Normal	$747,300
20 percent reduction	$597,840
35 percent reduction	$485,745
50 percent reduction	$373,650

Source: 2011 Calaveras County Water District Urban Water Management Plan

There are many methods available to offset the projected reduced revenue impacts from conservation. The CCWD could consider drought rates during shortages that increase the unit rate for all customers by a common factor assuming an equitable apportionment per person by connection. In addition, the CCWD maintains an emergency reserve to assist in cash flow during water shortages if necessary. If additional funds are still required, the District will consider utilizing operating reserves to meet the remaining revenue shortfalls. Specific CCWD vulnerabilities to drought and water shortage include the pumps and water treatment plants that are vulnerable due to pumping and treating silty water during times of low flows.

Agricultural Producers

In addition to the losses faced by the CCWD, agricultural producers in the County face risks from drought. It is difficult to quantify these risks, as the timing, length, and duration of the drought can all affect livestock, timber, and other agricultural resources. 2013 agricultural data from the County stated that there was in excess of $29 million of value to the agricultural products grown in the County. In addition, it is estimated that there is approximately a four to one revenue multiplier for crops grown in this region, so $29 million in production value is actually a $106 million impact on the local economy.

Future Development

With recent California DOF growth projections adding over 10,000 people to the Calaveras County population by 2035, a significant portion of future water demands will be met with a combination of increasing surface water diversions as well as increased groundwater extractions. New water connections are added at a rate from two percent to seven percent, depending on the system. The higher growth rates are in the Arnold and Copper Cove systems. New and proposed development in the Copper Cove/Copperopolis area along with proposed developments in the Camanche/Valley Springs area will require additional water supply projects to meet the increasing demands during average, single-dry, and multiple-dry water years. Projected supply and demand comparison to the year 2025 indicates that water demand is expected to increase the fastest in the areas of Copper Cove and Camanche Springs.

According to the CCWD Urban Water Management Plan (2005 update), small populations and low usage per connection have allowed water supplies to satisfy demand even in periods of drought, such as the driest years of record, 1976-1977 and 1987-1994. Low usage per connection is a reflection of the geography and climate of each system. In general, extensive landscaping, which can account for up to 40-60 percent of a single-family connection usage, is not feasible in many of CCWD's systems. However, recent and proposed growth in certain systems will require existing policies to be reviewed and modified and/or new

policies to be developed and implemented in order to better manage and conserve water supplies. The CCWD has established and used short-term water transfer arrangements to address water supply shortages.

4.3.5. Earthquake Vulnerability Assessment

Likelihood of Future Occurrence—Unlikely
Vulnerability—Medium

Although the HMPC feel this is a low significance hazard, due to the significance of earthquake in California, analysis of earthquake is included here.

Earthquake vulnerability is primarily based on population and the built environment. Urban areas in high seismic hazard zones are the most vulnerable, while uninhabited areas are less vulnerable.

Ground shaking is the primary earthquake hazard. Many factors affect the survivability of structures and systems from earthquake-caused ground motions. These factors include proximity to the fault, direction of rupture, epicenter location and depth, magnitude, local geologic and soils conditions, types and quality of construction, building configurations and heights, and comparable factors that relate to utility, transportation, and other network systems. Ground motions become structurally damaging when average peak accelerations reach 10 to 15 percent of gravity, average peak velocities reach 8 to 12 centimeters per second, and when the Modified Mercalli Intensity Scale is about VII (18-34 percent peak ground acceleration), which is considered to be very strong (general alarm; walls crack; plaster falls).

Earthquake losses will vary across the Calaveras County planning area depending on the source and magnitude of the event. A map showing peak ground accelerations in Calaveras County were shown on Figure 4-24 in Section 4.2.10. The EOP performed an earthquake risk analysis. It is captured here gives specific vulnerability of Calaveras County to earthquake.

If a significant earthquake were to occur within Calaveras County, it can be assumed that the following problems would arise:

Medical Facilities

There is one hospital facility located in Calaveras County. Mark Twain St. Joseph Hospital is located on Mountain Ranch Road, San Andreas, CA. In the event of a significant earthquake, this facility may suffer damage and operate at reduced efficiency. Additionally, numerous after-care facilities and nursing homes will be effected and should be taken into consideration.

Communications Systems

System failures, overloads, loss of electrical power, and possible failure of some alternate power systems will affect telephone systems. Immediately following an event, numerous failures will occur. Telephone, radio, and microwave systems are all expected to be effected and operate at a decreased capacity.

Utilities

A complete disruption of public utilities would occur in more heavily impacted areas for a period in excess of 72 hours. Transmission lines are vulnerable to many hazards, due to their length and remoteness of the lines. Damage to generation/substations may cause outages. Damages to generation affects production. Damage to substations affects delivery. Repairs to electrical equipment require physically clearing roadways, and movement of special equipment. Restoration of local electrical power will be coordinated with regional and local utility representatives. Much of the affected areas may have service restored in days, however, a severely damaged underground distribution system may create longer service delays.

Damage to natural gas facilities serving the Calaveras County area may consist primarily of isolated breaks in major transmission lines. Breaks in mains and individual service connections within the distribution system may also occur. These many leaks could pose a fire threat. Restoration of natural gas service could be significantly delayed.

Potable Water

Water availability and distribution for supporting life and treating the sick and injured is always a concern in any disaster. Although the County's water supply comes from various sources such as wells, distribution systems, and from local dams, there is still a threat that an earthquake could disrupt an area's water supply through broken distribution lines or contamination from broken sewer systems. Therefore, potable water will most likely have to be supplied in these area communities by outside source.

Transportation Systems

Transportation routes may be affected. Highway 4 in particular may suffer rock and soil slides and could become impassable in the higher elevation areas. Highway 49 could also suffer rock and soil slides and disrupt traffic flows.

Hazardous Materials

Calaveras County is home to many water treatment plants that store and use toxic materials. Calaveras is highly exposed to hazardous materials transported over major highways and county roadways. On any given day, a vast assortment of petroleum products, agricultural pesticides, and industrial chemicals are moved within the County with the possibility of generating a hazardous material incident. A natural disaster, such as an earthquake, can not only cause a hazardous materials event, but it can also cause it to escalate. Emergency response crews may be delayed due to effects of the earthquake by causing roadway blockages and building collapse.

There are several locations in Calaveras County where acutely Hazardous Materials are stored. These are the facilities within the county that pose the greatest threat to the population should a chemical spill occur. It should be noted that there are many more hazardous material storage sites within the county. Although they are smaller and less hazardous, they still hold the potential of becoming serious threats during an earthquake.

Dam Failure

There are six major dams located in Calaveras County with varying populations in their respective inundation areas. The probability of dam failure is heightened by seismic activity.

Income Losses

After any earthquake there will be a loss of income. Individuals can lose wages due to businesses inability to function because of damaged goods or facilities. Due to business losses, the County of Calaveras and the City of Angels Camp in the Calaveras Operational Area will lose revenue. Economic recovery from even a minor earthquake is critical to these communities.

The HMPC noted that there is no data on number of unreinforced masonry buildings. Calaveras County is located within Seismic Risk Zone 3. Calaveras County is not located within or adjacent to an Alquist-Priolo Earthquake Fault zone, and therefore the risk of surface fault rupture within the County is considered to be low.

Development Trends

Although new growth and development corridors would fall in the area potentially affected by earthquake, given the small chance of major earthquake and the building codes in effect, development in the earthquake area will continue to occur.

4.3.6. Flood Vulnerability Assessment

Likelihood of Future Occurrence—Occasional
Vulnerability—High

Historically, the Calaveras County planning area has always been at risk to flooding during the rainy season from November through April. The most significant risk exists along the Mokelumme and Stanislaus Rivers. Occasionally, extended heavy rains result in floodwaters exceeding normal high-water boundaries, overtopping of rivers and creeks, and flood damage. Winter storms are common in Calaveras County, and the snowmelt flooding has historically caused significant damages. The big damaging floods of 1973, 1995, 1998, 2006, and 2010 were generally the result of severe rainstorms and flash flooding. Other lesser flooding events have also occurred in other years. In addition to the major rivers, there are many streams, channels, canals, and creeks that serve the drainage needs of the County. There is significant threat of flooding in large areas of the County from several of these streams. Many of these streams are prone to rapid flooding with little notice.

Flooding has been frequent in the planning area, and the vulnerability to flood damages is high. This section quantifies the vulnerability of the planning area to floods.

Assets at Risk

Unincorporated Calaveras County and the City of Angels Camp have mapped FEMA flood hazard areas. GIS was used to determine the possible impacts of flooding within the County and how the risk varies

across the planning area. The following methodology was followed in determining improved parcel counts and assets at risk to the 1% annual chance flood event. FEMA flood hazard maps do not depict any areas of 0.2% annual chance flood events within the Calaveras County Planning area; therefore, analyses were not performed for those flood events. Analysis on assets at risk to floods in the County is provided for two different areas in this base plan:

- Calaveras County Planning Area
- Unincorporated Calaveras County

The Calaveras County planning area includes both the unincorporated County and the City of Angels Camp, essentially the entire geographical area of Calaveras County. Summary tables for the planning area are presented below. For the unincorporated County, both summary and detail tables are shown and discussed below. Detail tables for the City of Angels Camp are included in the City's annex to this plan.

Methodology

Calaveras County's 2013 parcel layer and April 2014 Assessor's data were used as the basis for the countywide inventory of developed parcels, acres, and values. Calaveras County has an effective FEMA DFIRM dated 12/17/2010 which was utilized to perform the flood analysis.

In some cases there are parcels in multiple flood zones, such as Zone A, Zone X, or Zone D. GIS was used to create a centroid, or point representing the center of the parcel polygon. DFIRM flood data was then overlaid on the parcel layer. For the purposes of this analysis, the flood zone that intersected a parcel centroid was assigned the flood zone for the entire parcel. The parcels were segregated and analyzed in this fashion for the entire Calaveras County planning area.

The model assumes that every parcel with a structure or other improved value greater than zero is improved in some way. This approach was used to support the parcel layer analysis as there was no associated building layer available for this analysis. Once completed, the parcel boundary layer was joined to the centroid layer and values were transferred based on the identification number in the Assessors database and the GIS parcel layer.

The property use summary categories (derived from the Use Code categories) previously assigned to the detailed assessor database were used to develop content value and show potential loss from hazards. Content values estimations are based on FEMA Hazus methodologies, which estimates value as a percent of improved structure values by property type/use. Table 4-39 shows the breakdown of the different property types in Calaveras County and their estimated content replacement value percentages.

Table 4-39 Content Replacement Factors

Property Use	Content Replacement Values
Residential	50%
Agricultural	100%
Commercial	100%
Institutional	100%

Property Use	Content Replacement Values
Other	100%
Industrial	150%
Vacant Land	0%

Source: Hazus 2.2

The loss estimate for flood is based on the total of improved and contents value. Improved parcels include those with structures as well as other improvements identified in the Assessor's database such as mobile homes and winery equipment. Only improved parcels and the value of their improvements were included in the flood loss analysis. The value of land is not included in the loss estimates as generally the land is not at loss to floods, just the value of improvements and structure contents. The land value is represented in the detailed flood tables, but are only present to show the value of the land associated with each flood zone.

Once the potential value of affected parcels was calculated, a damage factor was applied to obtain loss estimates by flood zone. When a flood occurs, seldom does the event cause total destruction of an area. Potential losses from flooding are related to a variety of factors including flood depth, flood velocity, building type, and construction. The percent of damage is primarily related to the flood depth. FEMA's flood benefit/cost module uses a simplified approach to model flood damage based on building type and flood depth. The assets at risk in the flood analysis tables were refined by applying an average damage estimation of 20% of the total building value. The 20% damage estimate utilized FEMA's Flood Building Loss Table based on an average flood depth of 2 feet.

It also should be noted that the resulting flood loss estimates may actually be more or less than that presented in the below tables as the planning area may include structures located within the 100-year floodplain that are elevated at or above the level of the base flood elevation, according to local floodplain development requirements. Also, it is important to keep in mind that these assessed values may be well below the actual market value of improved parcels located within the 100-year floodplain.

Each of the DFIRM flood zones that begins with the letter 'A' depict the Special Flood Hazard Area, or the 1% annual chance flood event (commonly referred to as the 100-year flood). Table 4-40 explains the difference between DFIRM mapped flood zones within the 1% annual chance flood zone as well as other flood zones located within the planning area. The effective DFIRM maps for the Calaveras County planning area are shown on Figure 4-47 for the eastern portion of the County, and Figure 4-48 for the western portion of the County.

Table 4-40 Calaveras County Planning Area – DFIRM Flood Hazard Zones

Flood Zone	Description
A	100-year Flood: No base flood elevations provided
AE	100-year Flood: Base flood elevations provided
D	Areas where there are possible but undetermined flood hazards, as no analysis of flood hazards has been conducted
X	No flood hazard

Source: FEMA

Figure 4-47 Calaveras County Planning Area East – DFIRM Flood Zones

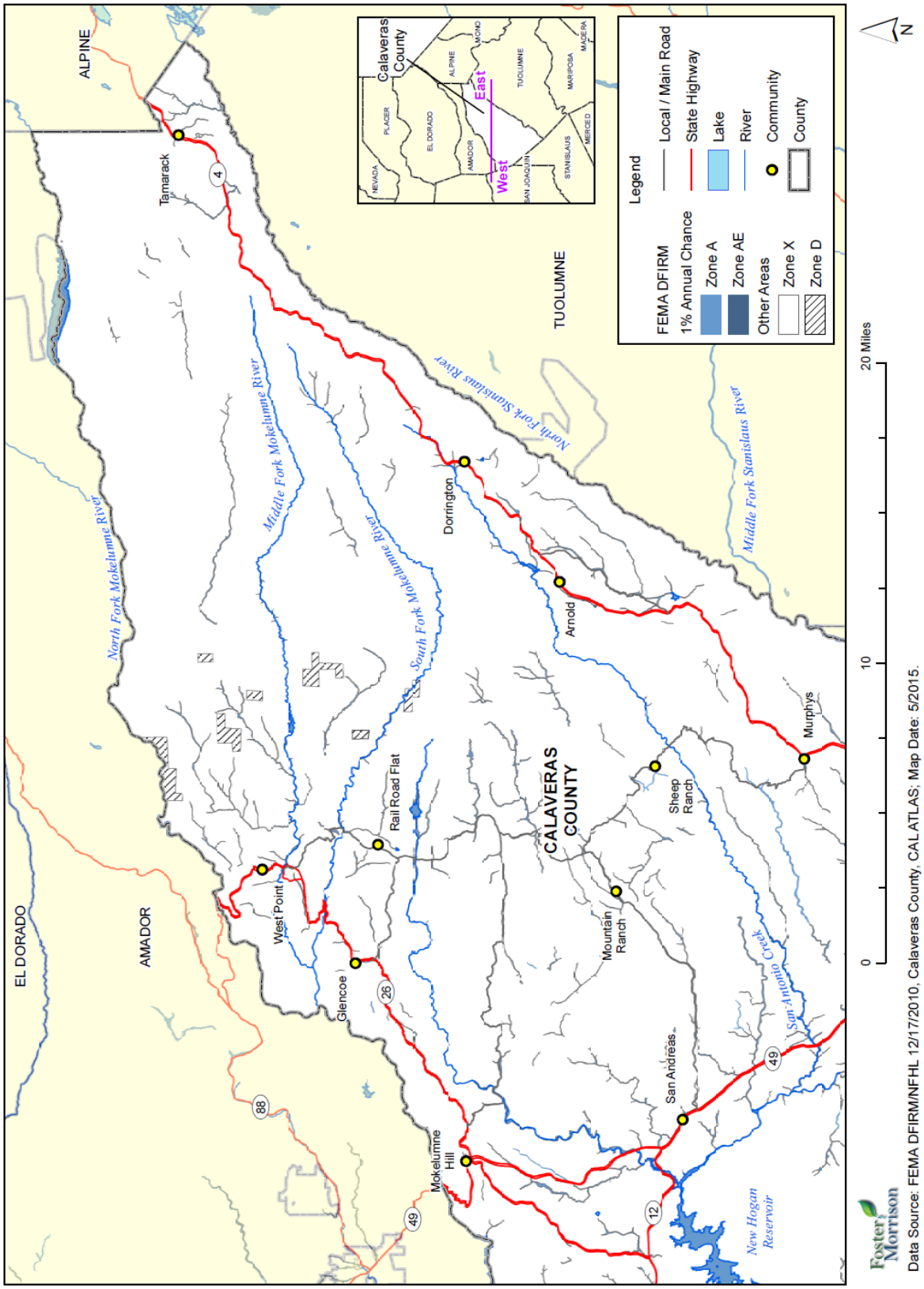
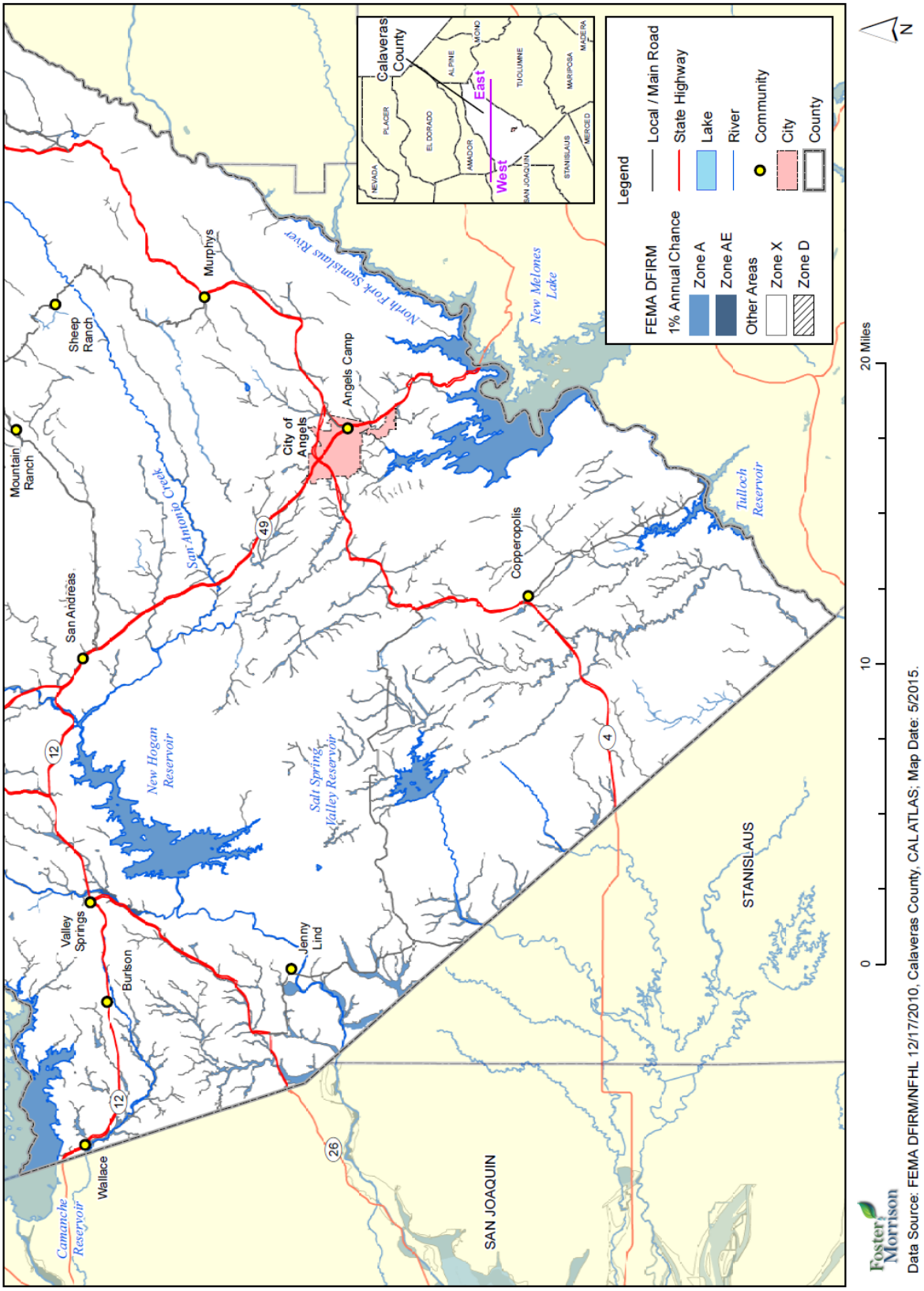


Figure 4-48 Calaveras County Planning Area West – DFIRM Flood Zones



The end result of the flood hazard analysis is an inventory of the numbers, types, and values of parcels subject to the flood hazard. Results are presented here first for the Calaveras County planning area and secondly for unincorporated county. Results for the City of Angels Camp are presented in its Annex to the plan.

In addition to the centroid analysis used to obtain numbers of parcels and assets at risk to flood hazards, parcel boundary analysis was performed to obtain total acres and flooded acres by flood zone for each parcel. The parcel layer was intersected with the FEMA DFIRM data to obtain the acres flooded. The results of the flooded acres analysis methodology and results are presented at the end of this section.

Calaveras County Planning Area

Table 4-41 and Table 4-42 contain flood analysis results for the entire Calaveras County planning area. This includes unincorporated Calaveras County and the City of Angels Camp. These tables show the number of parcels and assets at risk to the 1% annual chance event for the entire Calaveras County planning area. Table 4-41 shows the value of improved parcels by jurisdiction. Table 4-42 shows the improved parcels by property use category in each flood zone for the entire planning area.

Table 4-41 Calaveras County Planning Area – Count and Improved Value of Parcels in Flood Zone by Jurisdiction

Jurisdiction	Total Parcel Count	Improved Parcel Count	Total Improved Value*	Improved Parcels in the 1% Flood Zone	Total Improved Value in the 1% Flood Zone
City of Angels Camp	2,232	1,599	$327,378,599	21	$4,794,767
Unincorporated	39,372	24,764	$3,818,269,086	709	$129,354,978
Total	**41,604**	**26,363**	**$4,145,647 ,685**	**730**	**$134,149,745**

Source: FEMA DFIRM 2010, Calaveras County Assessor's 2014 Data, County Parcel Layer 2013
*Improved Structure Value and Improved Other Value are captured in this column.

Table 4-42 Calaveras County Planning Area – Count and Improved Value by Property Use and 1% Annual Chance Flood Zone

				1% Annual Chance Flood Zone		
Property Use	Total Parcel Count	Improved Parcel Count	Total Improved Value	Total Parcel Count	Improved Parcel Count	Total Improved Value
Agricultural	2,128	995	$176,416,242	92	46	$11,412,729
Commercial	667	578	$194,421,895	29	26	$5,755,684
Institutional	126	85	$37,026,444	5	2	$230,505
Industrial	825	88	$42,820,660	113	0	$0
Other	2,199	172	$19,185,339	182	12	$822,961
Residential	24,674	24,024	$3,649,767,078	685	625	$113,896,997
Vacant Land	10,985	421	$26,010,027	426	19	$2,030,869
Total	**41,604**	**26,363**	**$4,145,647,685**	**1,532**	**730**	**$134,149,745**

Source: FEMA DFIRM 2010, Calaveras County Assessor's 2014 Data; County Parcel Layer 2013

Table 4-43 shows potential losses summarized by the 1% annual chance flood event with loss estimate and loss ratios for the planning area. The loss ratio is the loss estimate divided by the total potential exposure (i.e., total of improved and contents value for all parcels located in the planning area) and displayed as a percentage of loss. FEMA considers loss ratios greater than 10% to be significant and an indicator that a community may have more difficulties recovering from a flood. The County should keep in mind that the loss ratio could increase with additional development in the 1% annual chance floodplain, unless development is elevated in accordance with the local floodplain management ordinance.

Table 4-43 Calaveras County Planning Area – Flood Loss Estimates

Flood Zone	Improved Parcel Count	Total Improved Value	Estimated Contents Value	Total Value	Loss Estimate	Loss Ratio
1% Annual Chance	730	$134,149,745	$75,285,6302	$209,435,375	$41,887,075.0	0.72%
Total	**730**	**$134,149,745**	$75,285,6302	$209,435,375	$41,887,075.0	**0.72%**

Source: FEMA DFIRM 2010, Calaveras County Assessor's 2014 Data

According to the information in Table 4-41 through Table 4-43, the Calaveras County planning area has 730 improved parcels and roughly $222 million of structure and contents value in the 1% annual chance floodplain. There are no improved parcels in the 0.2% annual chance flood event. A loss ratio of 0.72% indicates that while the County does have assets at risk, those asset values do not indicate a disproportionate number of assets in the FEMA floodplains.

Unincorporated Calaveras County

Table 4-44 and Table 4-45 contain information for unincorporated Calaveras County only. Table 4-44 shows the number of improved parcels and associated structure and other improved assets at risk to the each of the FEMA flood zones using the DFIRM data in the unincorporated areas and Table 4-45 shows potential losses summarized by 1% annual chance flood events with loss estimates and loss ratios.

Table 4-44 Unincorporated Calaveras County– Count and Improved Value by Property Use and Detailed Flood Zone

Flood Zone	Property Use	Total Parcel Count	Total Land Value	Improved Parcel Count	Total Improved Value	Total Value*
Zone A	Agricultural	92	$8,307,179	46	$11,412,729	$19,719,908
Zone A	Commercial	18	$1,434,107	17	$2,500,982	$3,935,089
Zone A	Industrial	4	$536,677	1	$76,293	$612,970
Zone A	Institutional	111	$0	0	$0	$0
Zone A	Other	172	$6,230,045	12	$822,961	$7,053,006
Zone A	Residential	630	$41,369,953	575	$104,638,012	$146,007,965
Zone A	Vacant Land	395	$14,789,165	17	$1,713,969	$16,503,134
Total Zone A		**1,422**	**$72,667,126**	**668**	**$121,164,946**	**$193,832,072.00**

Flood Zone	Property Use	Total Parcel Count	Total Land Value	Improved Parcel Count	Total Improved Value	Total Value*
Zone AE	Agricultural	0	$0	0	$0	$0
Zone AE	Commercial	8	$1,202,985	6	$2,673,558	$3,876,543
Zone AE	Industrial	0	$0	0	$0	$0
Zone AE	Institutional	0	$0	0	$0	$0
Zone AE	Other	4	$2,827	0	$0	$2,827
Zone AE	Residential	38	$920,644	34	$5,514,574	$6,435,218
Zone AE	Vacant Land	13	$258,924	1	$1,900	$260,824
Total Zone AE		**63**	**$2,385,380**	**41**	**$8,190,032**	**$10,575,412**
Zone D	Agricultural	2	$126,285	1	$61,000	$187,285
Zone D	Commercial	0	$0	0	$0	$0
Zone D	Industrial	0	$0	0	$0	$0
Zone D	Institutional	7	$0	0	$0	$0
Zone D	Other	0	$0	0	$0	$0
Zone D	Residential	0	$0	0	$0	$0
Zone D	Vacant Land	1	$70,884	0	$0	$70,884
Total Zone D		**10**	**$197,169**	**1**	**$61,000**	**$258,169**
Zone X	Agricultural	2,027	$155,398,078	946	$164,890,258	$320,288,336
Zone X	Commercial	506	$50,273,616	436	$145,977,461	$196,251,077
Zone X	Industrial	117	$13,603,330	80	$36,161,977	$49,765,307
Zone X	Institutional	659	$6,989,760	73	$27,481,829	$34,471,589
Zone X	Other	1,902	$42,720,843	151	$17,655,158	$60,376,001
Zone X	Residential	22,527	$807,489,297	21,970	$3,273,588,316	$4,081,077,613
Zone X	Vacant Land	10,139	$354,625,153	398	$23,098,109	$377,723,262
Total Zone X		**37,877**	**$1,431,100,077.00**	**24,054**	**$3,688,853,108**	**$5,119,953,185**
Grand Total		**39,372**	**$1,506,349,752**	**24,764**	**$3,818,269,086**	**$5,324,618,838**

Source: FEMA DFIRM 2010, Calaveras County Assessor's 2014 Data, County Parcel Layer 2013
*Land and structure values

Table 4-45 Unincorporated Calaveras County – Flood Loss Estimates

Flood Zone	Improved Parcel Count	Improved Structure Value	Estimated Contents Value	Total Value	Loss Estimate	Loss Ratio
1% Annual Chance	709	$129,354,978	$72,600,963	$201,955,941	$40,391,188	0.76%
Total	**709**	**$129,354,978**	$72,600,963	**$201,955,941**	**$40,391,188**	0.76%

Source: FEMA DFIRM 2010, Calaveras County Assessor's 2014 Data, County Parcel Layer 2013

According to Table 4-44 and Table 4-45, unincorporated Calaveras County has 709 improved parcels and roughly $215,211,898 of structure and contents value in the 1% annual chance floodplain. These values

can be refined a step further. Applying the 20 percent damage factor as previously described, there is a 1% chance in any given year of a flood event causing roughly $43,042,380 in damage in the unincorporated areas of Calaveras County. A loss ratio of 0.76% indicates that while the unincorporated County has assets at risk in the floodplain, flood losses would be limited compared to the total built environment and the community would likely be able to recover adequately.

Flooded Acres

Also of interest is the land area affected by the various flood zones. The following is an analysis of flooded acres in the Calaveras County planning area. Details on flooded acres in the City of Angels Camp are shown in their annex to this plan.

Methodology

GIS was used to calculate acres flooded by FEMA flood zones and property use categories. The Calaveras County parcel layer and effective DFIRM data were intersected, and each segment divided by the intersection of flood zone and parcels was calculated for acres. This process was conducted for 1% annual chance flood areas, with each segment being defined by zone type (A, AE, and D) and acres. The Calaveras County effective DFIRM does not include any 0.2% annual chance flood areas, and therefore the flooded acres were not captured in this analysis. The resulting data tables with flooded acreages were then imported into a database and linked back to the original parcels, including total acres and land/improvement values, by parcel number. Once this was completed, each parcel contained acreage values for flooded acre by zone type within the parcel. In the tables below, the 1% annual chance flood zone is represented and then split out by property use, their total flooded acres, total improved acres, and percent of improved acres that are flooded.

It is important to keep in mind that this methodology assumes that improvements are uniformly found throughout the parcel, while in reality only portions of the parcel are improved, and improvements may or may not fall within the flood zone portion of a parcel. Thus, areas of flooded improvements calculated through this method may be higher or lower than those presented.

Table 4-46 and Table 4-47 represent a detailed and summary analysis of total acres for each FEMA DFIRM flood zone. Table 4-46 gives summary information for the planning area. Table 4-47 gives detailed information by property use for the unincorporated County. This information is available for the City of Angels Camp jurisdiction in its annex.

Table 4-46 Calaveras County Planning Area – Flooded Acres

Jurisdiction	Flood Zone	Total Flooded Acres	Improved Flooded Acres	% of Improved Flooded Acres
City of Angels Camp	1% Annual Chance	120.26	82.47	68.6%
	0.2% Annual Chance	0	0	0.0%
Unincorporated County	1% Annual Chance	35,161.53	8,927.38	25.4%
	0.2% Annual Chance	0	0	0.0%

Source: FEMA DFIRM 2010, County Parcel Layer 2013

Table 4-47 Unincorporated Calaveras County – Flooded Acres

Flood Zone	Property Use	Total Flooded Acres	Improved Flooded Acres	% of Improved Flooded Acres
A	Agricultural	7,572.80	3,862.42	51.0%
	Commercial	96.40	96.26	99.9%
	Industrial	20.27	11.34	56%.0
	Institutional	7,901.69	0.00	0.0%
	Other	11,273.04	2,130.99	18.9%
	Residential	2,289.62	2,173.68	94.9%
	Vacant Land	3,747.56	463.44	12.4%
	Total Zone A	**32,901.38**	**8,738.13**	**26.6%**
AE	Agricultural	0.00	0.00	0.0%
	Commercial	111.70	103.19	92.4%
	Industrial	0.00	0.00	0.0%
	Institutional	0.00	0.00	0.0%
	Other	0.67	0.00	0.0%
	Residential	41.74	30.12	72.2%
	Vacant Land	33.28	14.80	44.5%
	Total Zone AE	**187.39**	**148.11**	**79.0%**
D	Agricultural	470.06	41.14	8.8%
	Commercial	0.00	0.00	0.0%
	Institutional	0.00	0.00	0.0%
	Industrial	1,560.53	0.00	0.0%
	Other	0.00	0.00	0.0%
	Residential	0.00	0.00	0.0%
	Vacant Land	42.17	0.00	0.0%
	Total Zone D	**2,072.76**	**41.14**	**0.2%**

Source: FEMA DFIRM 2010, County Parcel Layer 2013

Population at Risk

The DFIRM flood zones were overlayed on the parcel layer. Those residential parcel centroids that intersect the severity zones were counted and multiplied by the 2010 Census Bureau average household factors for each jurisdiction and unincorporated area. Results were tabulated by jurisdiction. According to this analysis, there is a total population of 1,440 residents of Calaveras County planning area at risk to flooding. This is shown in Table 4-57. Table 4-58 shows a population of 1,401 within the unincorporated County. Population information relative to the flood hazard for the City of Angels Camp is provided in its Annex.

Table 4-48 Calaveras County Planning Area – Count of Improved Residential Parcels and Population by Flood Zone

Flood Zone	Improved Residential Parcels	Population*
A	584	1,343
AE	42	97
D	0	0
Total	**626**	**1,440**

Source: Calaveras County 2014 Assessor's Data; FEMA DFIRM 2010, US Census Bureau
* Average household populations from the 2010 US Census were used: Calaveras County – 2.30; Angels Camp – 2.30.

Table 4-49 Unincorporated Calaveras County - Count of Improved Residential Parcels and Population by Flood Zone

Flood Zone	Improved Residential Parcels	Population*
A	575	1,323
AE	34	78
D	0	0
Total	**609**	**1,401**

Source: Calaveras County 2014 Assessor's Data; FEMA DFIRM 2010, US Census Bureau
* Average household populations from the 2010 US Census were used: Calaveras County – 2.30; Angels Camp – 2.30.

NFIP Insurance Coverage Details

Unincorporated Calaveras County joined the NFIP on September 5, 1990. The County does not participate in the Community Rating System. NFIP insurance data provided by DWR indicates that as of September 5, 2014, there were 332 policies in force in the unincorporated County with $226,596 in premiums, resulting in $94,200,500 of insurance in force. There have been 28 closed paid losses totaling $767,613. 5 of the claims were considered substantial damage losses. Of these losses, 20 were parcels in A zones, 27 parcels were in X zone, and 1 was a parcel in an unknown zones. Of the 28 claims, 18 claims were associated with pre-FIRM structures and 10 with post-FIRM structures. There were 4 repetitive loss structures in the County. 2 were in A zones, and 2 were in B, C, or X zones. These repetitive loss structures account for $497,418.80 of the total losses in the County. There were no severe repetitive loss properties in the County.

Critical Facilities at Risk

A separate analysis was performed on the critical facility inventory in Calaveras County and Angels Camp. GIS was used to determine whether the facility locations intersects a DFIRM flood hazard areas, and if so, which zone it intersects. Figure 4-49 shows the critical facilities in the County overlaid on the flood zones. In unincorporated Calaveras County, there are 14 facilities in the 1% annual chance flood event and 0 facilities in the 0.2% annual chance flood event detailed in Table 4-50. Details of critical facilities in Angels Camp is shown in its respective annexes to this plan. Details of critical facility definition, type, name and address and jurisdiction by flood zone are listed in Appendix F.

Figure 4-49 Unincorporated Calaveras County – Critical Facilities in DFIRM Flood Zones

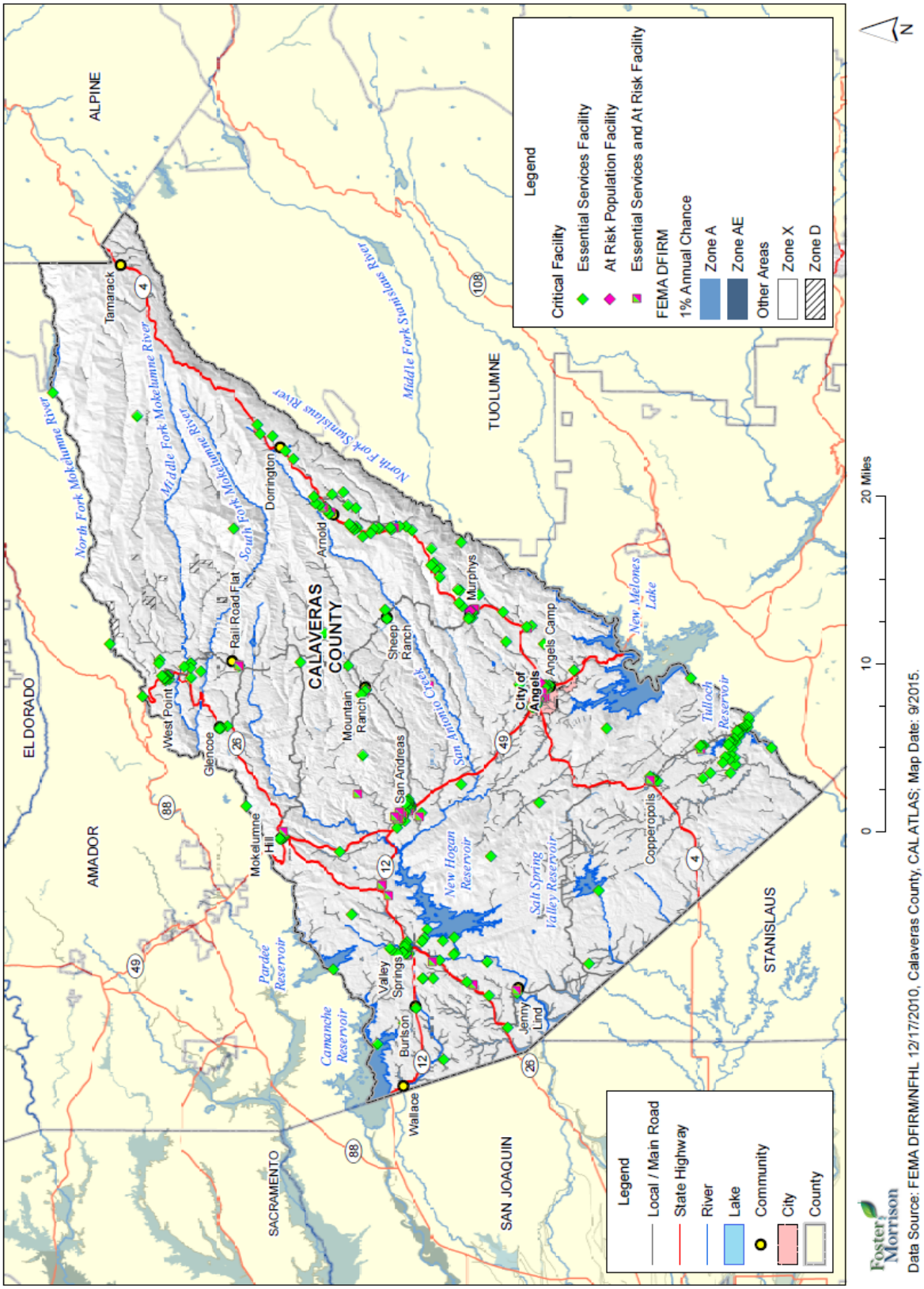


Table 4-50 Unincorporated Calaveras County – Critical Facilities in DFIRM Flood Zones

Flood	Category	Type	Facility Count
0.2% Annual Chance	At Risk Population Facilities	–	0
	Essential Services Facilities	–	0
	Hazardous Materials Facilities	–	0
	Multiple Categories	–	0
	Total 0.2% Annual Chance		**0**
1% Annual Chance (Zone A, AE)	At Risk Population Facilities	–	0
	Essential Services Facilities	Community Food Bank / Pantry	1
		Emergency Evacuation Center	1
		Fire Station	1
		Police	1
		Power Utility	3
		Waste Water Facility	5
		Water Facility	2
	Hazardous Materials Facilities	–	0
	Multiple Categories	–	0
	Total 1% Annual Chance		**14**

Source: Calaveras County GIS, FEMA DFIRM 2010.

The HMPC noted that the wastewater treatment plant and the wastewater reclamation facility in the Copper Cove/Copperopolis area have ponds that are subject to flooding. It was also noted that, although these facilities are in Zone A, the parcels do not flood.

Future Development

Where and how to build is generally addressed in local floodplain ordinances. These ordinances should be reviewed and updated as development in new areas is considered. Master planning will be necessary to assure that open channel flood flow conveyances serving the smaller internal streams and drainage areas are adequately prepared to accommodate the flows. These developments can bring the revenue needed to solve existing flooding problems by constructing ecologically sensitive water conveyance areas with peak flow detention.

There are no planned facilities that will be built in or near the flood zone.

Future Development GIS Analysis

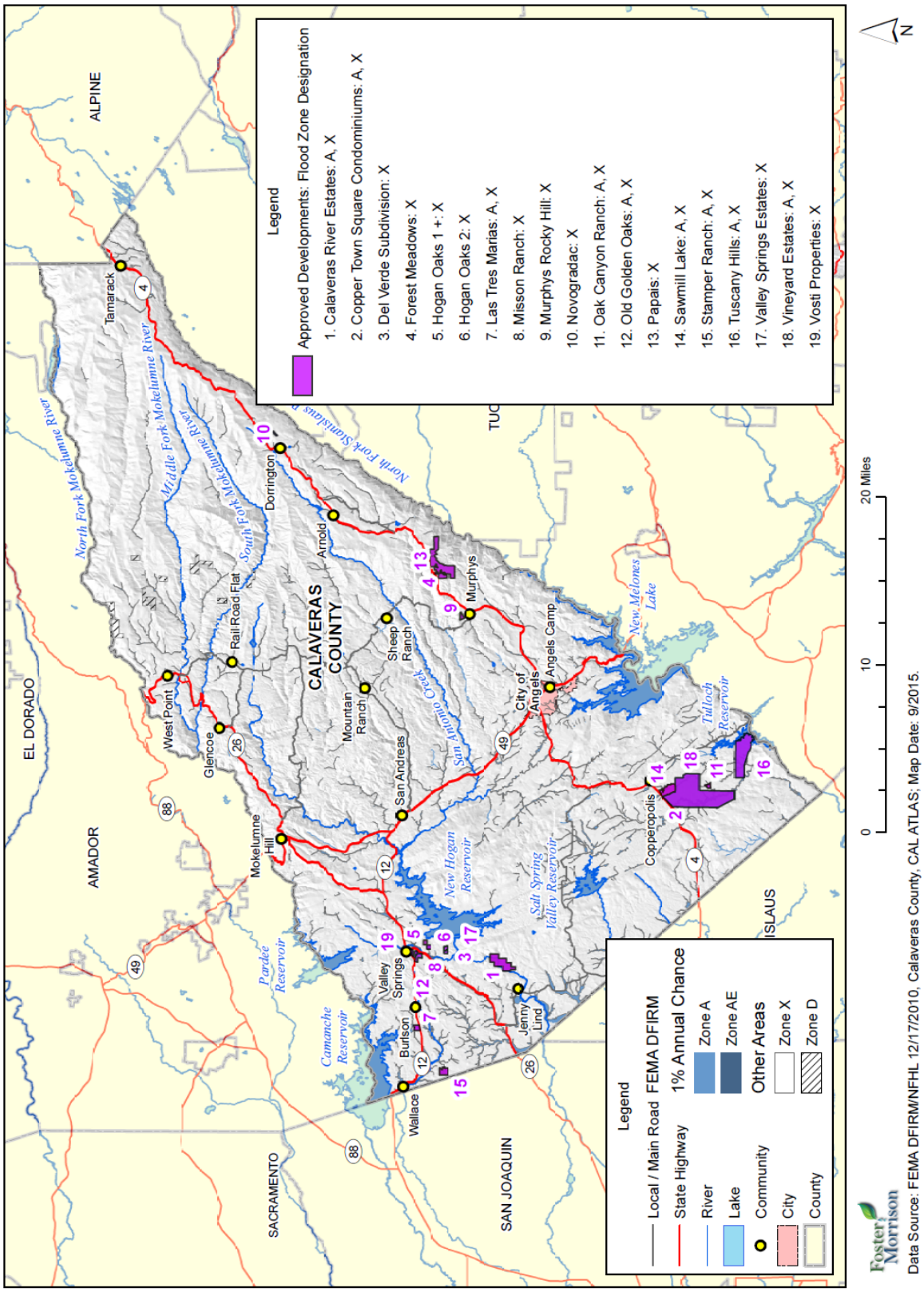
Future development areas were provided by Calaveras County. Analysis was performed by intersecting parcel centroids of the future development areas with FEMA flood zones to provide a parcel level analysis of future development areas for the County. See Table 4-51 for an inventory of approved development projects and flood zones. These are also shown on Figure 4-51.

Table 4-51 Calaveras County Future Development by Flood Zone

Approved Development Projects	# of Units	# of Parcels	Project Date	Acres	Flood Zone
Calaveras River Estates	2	2	2006	494	A, X
Copper Town Square Condominiums	0	28	-	27	A, X
Del Verde Subdivision	1	1	2005	40	X
Forest Meadows	852	852	-	876	X
Hogan Oaks 1 +	1	1	2002	37	X
Hogan Oaks 2	1	1	2011	45	X
Las Tres Marias	1	1	2004	79	A, X
Misson Ranch	2	2	2006	81	X
Murphys Rocky Hill	2	2	2007	47	X
Novogradac	2	2	2003	14	X
Oak Canyon Ranch	19	19	2000	3,242	A, X
Old Golden Oaks	1	1	2006	28	A, X
Papais	0	4	2014	37	X
Sawmill Lake	0	9	-	254	A, X
Stamper Ranch	1	1	2003	133	A, X
Tuscany Hills	1	1	2001	1,096	A, X
Valley Springs Estates	1	1	1989	31	X
Vineyard Estates	1	1	2008	40	A, X
Vosti Properties	1	1	-	30	X
Total	**889**	**930**	**–**	**6,632**	

Source: Calaveras County GIS

Figure 4-50 Calaveras County Future Development by Flood Zone



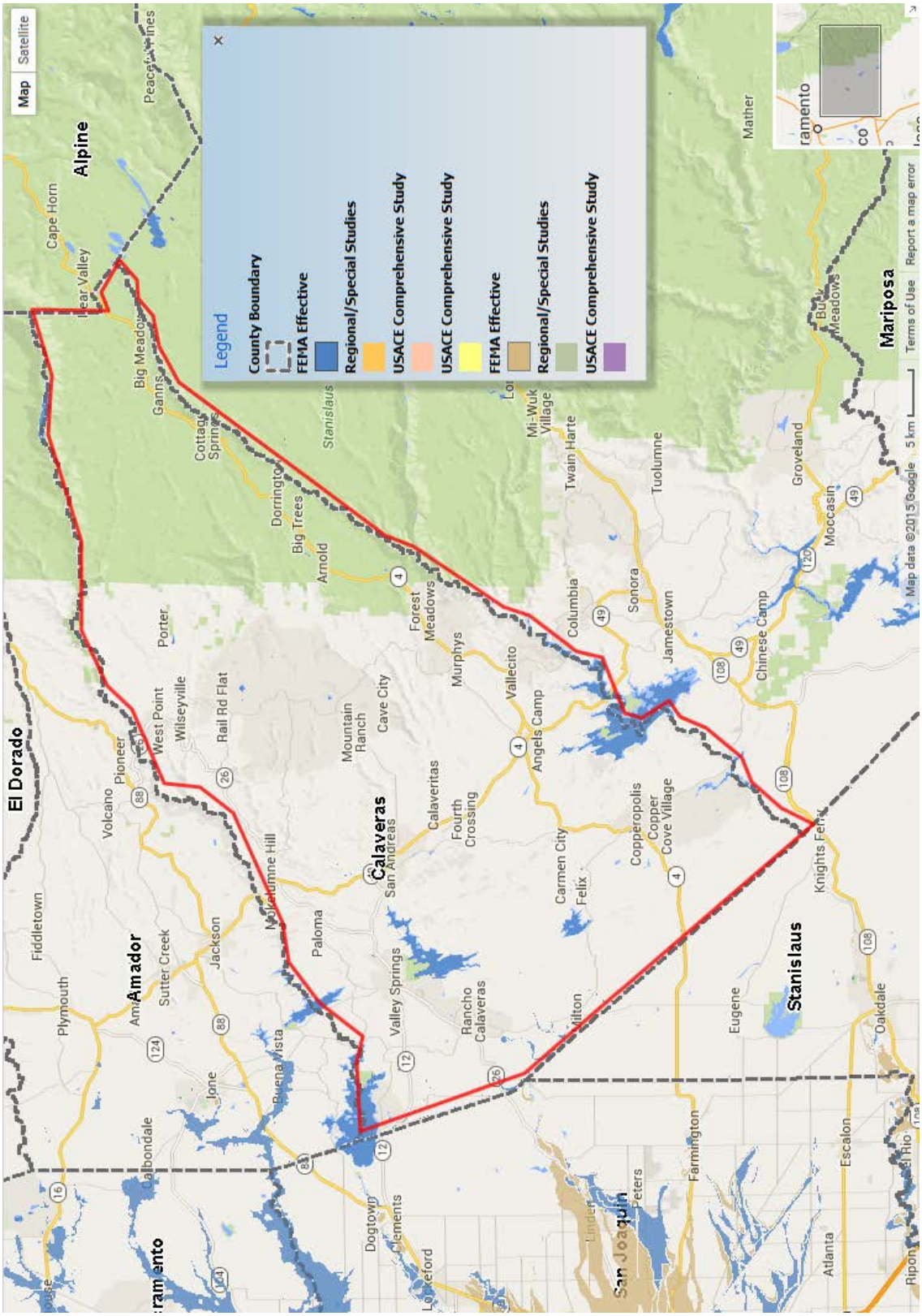
California Department of Water Resources Best Available Maps (BAM)

The FEMA regulatory maps provide just one perspective on flood risks in Calaveras County. Senate Bill 5 (SB 5), enacted in 2007, authorized the California DWR to develop the Best Available Maps (BAM) displaying 100- and 200-year floodplains for areas located within the Sacramento-San Joaquin (SAC-SJ) Valley watershed. SB 5 requires that these maps contain the best available information on flood hazards and be provided to cities and counties in the SAC-SJ Valley watershed. This effort was completed by DWR in 2008. DWR has expanded the BAM to cover all counties in the State and to include 500-year floodplains.

Different than the FEMA DFIRMs which have been prepared to support the NFIP and reflect only the 100-year event risk, the BAMs are provided for informational purposes and are intended to reflect current 100-, 200-, and 500-year event risks using the best available data. The 100-year floodplain limits on the BAM are a composite of multiple 100-year floodplain mapping sources. It is intended to show all currently identified areas at risk for a 100-year flood event, including FEMA's 100-year floodplains. The BAM are comprised of different engineering studies performed by FEMA, Corps, and DWR for assessment of potential 100-, 200-, and 500-year floodplain areas. These studies are used for different planning and/or regulatory applications. They are for the same flood frequency, however, they may use varied analytical and quality control criteria depending on the study type requirements.

The value in the BAMs is that they provide a bigger picture view of potential flood risk to the Calaveras County Planning Area than that provided in the FEMA DFIRMS. This provides the community and residents with an additional tool for understanding potential flood hazards not currently mapped as a regulated floodplain. Improved awareness of flood risk can reduce exposure to flooding for new structures and promote increased protection for existing development. Informed land use planning will also assist in identifying levee maintenance needs and levels of protection. By including the FEMA 100-year floodplain, it also supports identification of the need and requirement for flood insurance. Figure 4-51 shows the BAM for the Calaveras County Planning Area. BAM maps for the City of Angels Camp is included in its annex.

Figure 4-51 Calaveras County Planning Area – Flood Awareness (Best Available) Map



Source: California DWR

ARkStorm Scenario

Although much attention in California's focuses on the "Big One" as a high magnitude earthquake, there is the risk of another significant event in California – a massive, statewide winter storm. The last such storms occurred in the 19th century, outside the memory of current emergency managers, officials, and communities. However, massive storms are a recurring feature of the state, the source of rare but inevitable disasters. The USGS Multi Hazards Demonstration Project's (MHDP) developed a product called ARkStorm, which addressed massive U.S. West Coast storms analogous to those that devastated California in 1861-1862. Over the last decade, scientists have determined that the largest storms in California are the product of phenomena called Atmospheric Rivers, and so the MHDP storm scenario is called the ARkStorm, for Atmospheric River 1000 (a measure of the storm's size).

Scientific studies of offshore deposits in northern and southern California indicate that storms of this magnitude and larger have occurred about as often as large earthquakes on the southern San Andreas Fault. Such storms are projected to become more frequent and intense as a result of climate change. This scientific effort resulted in a plausible flood hazard scenario to be used as a planning and preparation tool by hazard mitigation and emergency response agencies.

For the ARkStorm Scenario, experts designed a large, scientifically realistic meteorological event followed by an examination of the secondary hazards (e.g., landslides and flooding), physical damages to to the intense winter storms of 1861-62 that left California's Central Valley impassible. Storms far larger than the ARkStorm, dubbed megastorms, have also hit California at least six times in the last two millennia.

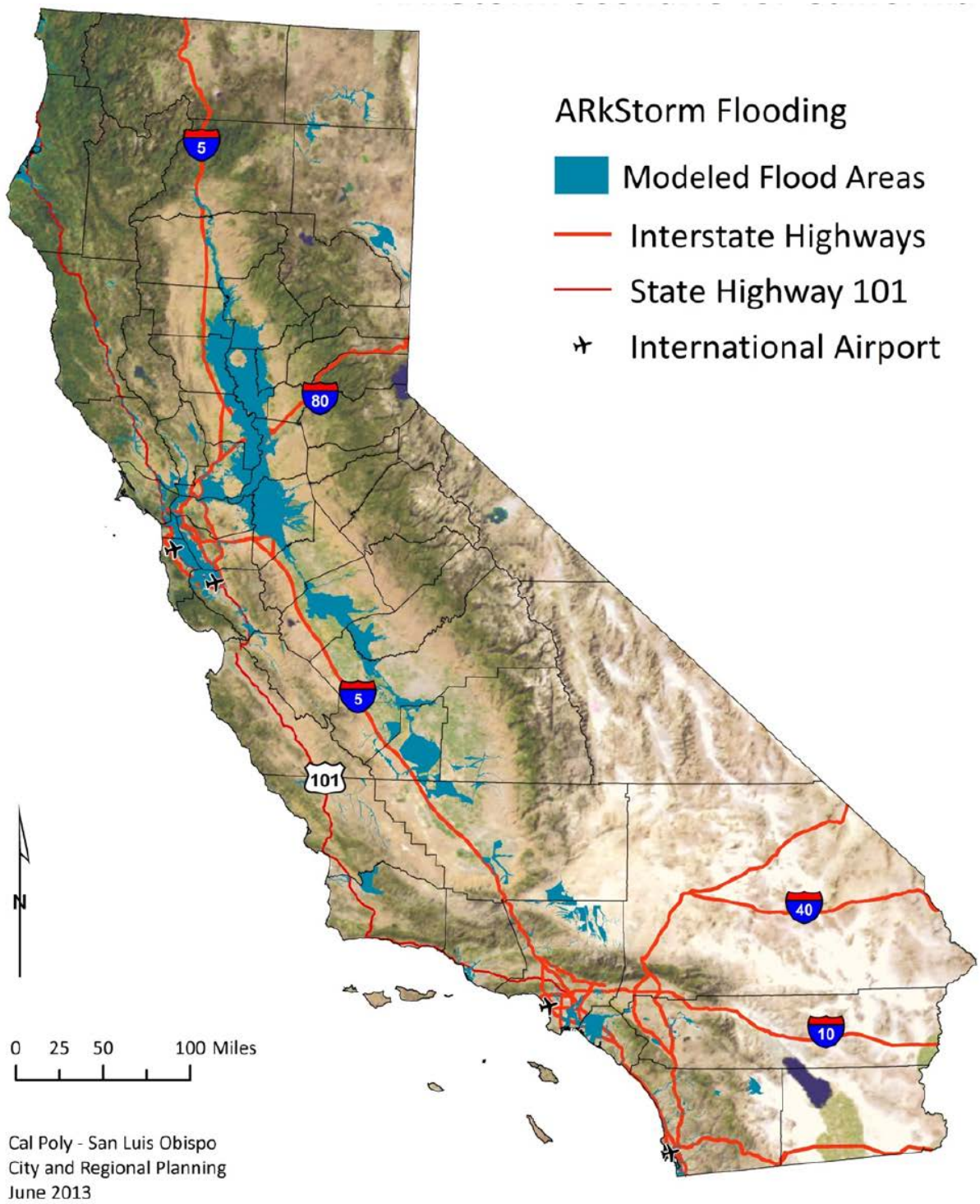
The ARkStorm produces precipitation in many places exceeding levels experienced on average every 500 to 1,000 years. Extensive flooding in many cases overwhelms the state's flood protection system, which is at best designed to resist 100- to 200-year runoffs (many flood protection systems in the state were designed for smaller runoff events). The Central Valley experiences widespread flooding. Serious flooding also occurs in Orange County, Los Angeles County, San Diego, the San Francisco Bay Area, and other coastal communities. In some places, winds reach hurricane speeds, as high as 125 miles per hour. Hundreds of landslides occur, damaging roads, highways, and homes. Property damage exceeds $300 billion, most of it from flooding. Agricultural losses and other costs to repair lifelines, dewater flooded islands, and repair damage from landslides brings the total direct property loss to nearly $400 billion, of which only $20 to $30 billion would be recoverable through public and commercial insurance. Power, water, sewer, and other lifelines experience damage that takes weeks or months to restore. Flooding evacuation could involve over one million residents in the inland region and Delta counties.

A storm of ARkStorm's magnitude has important implications: 1) it raises serious questions about the ability of existing national, state, and local disaster policy to handle an event of this magnitude; 2) it emphasizes the choice between paying now to mitigate, or paying a lot more later to recover; 3) innovative financing solutions are likely to be needed to avoid fiscal crisis and adequately fund response and recovery costs; 4) responders and government managers at all levels could be encouraged to conduct self-assessments and devise table-top exercises to exercise their ability to address a similar event; 5) the scenario can be a reference point for application of FEMA and Cal OES guidance connecting federal, state, and local natural hazards mapping and mitigation planning under the NFIP and Disaster Mitigation Act of 2000; and 6)

common messages to educate the public about the risk of such an extreme event could be developed and consistently communicated to facilitate policy formulation and transformation.

Figure 4-52 depicts an ARkStorm modeled scenario showing the potential for flooding in the Central Valley as the result of a large storm.

Figure 4-52 Projected ARkStorm Flooding in California



Source: USGS ArkStorm

4.3.7. Flood: Localized Flooding Vulnerability Assessment

Likelihood of Future Occurrence—Highly Likely
Vulnerability—High

Historically, the County has been at risk to flooding primarily during the spring months when river systems in the County swell with heavy rainfall. Localized flooding also occurs throughout the planning area at various times throughout the year with one area of primary concern unique to the County where impervious ground causes localized flooding near one of the water treatment plants.

The HMPC noted that the wastewater treatment plant and the wastewater reclamation facility in the Copper Cove/Copperopolis area that, although these facilities are located in Zone A, the parcels do not flood. However, heavy rains can cause flooding. These storm flows often go to the Jenny Lind wastewater treatment plan and can affect the plant intake.

The HMPC noted that State highways and County roadways are locally inundated during floods. Access roads and bridges serving residential areas are locally inundated during floods. Members of the public believe that flooding is occurring because drainages are overgrown with vegetation and want the County to remove the vegetation. Drainages are located on private property and the County has no right or responsibility to do vegetation removal. Many waterways in the County support Federally- and State-listed special status plant and animal species. The County provided localized flooding areas. These are provided in Table 4-52.

Table 4-52 Localized Flooding Areas

Road Name	Flooding	Pavement Deterioration	Washouts	High Water/ Creek Crossing	Landslides/ Mudslides	Debris	Downed Trees
State Route 12	X						
State Route 26	X						
Hogan Dam Road	X			X			
Gold Creek Drive	X			X			
Saint Andrews Rd	X			X			
Saint Andrews Dr	X						
Vista Del Lago Dr	X			X			
Grouse Dr	X						
Silver Rapids Rd	X			X			
Barney Way	X			X			

Source: Calaveras County

Future Development

The risk of stormwater/localized flooding to future development can be minimized by accurate recordkeeping of repetitive localized storm activity. Mitigating the root causes of the localized stormwater

or choosing not to develop in areas that often are subject to localized flooding will reduce future risks of losses due to stormwater/localized flooding.

The potential for flooding may increase as storm water is channelized due to land development. Such changes can create localized flooding problems in and outside of natural floodplains by altering or confining natural drainage channels. Floodplain modeling and master planning should be based on the ultimate built-out land use in order to assure that all new development remains safe from future hydrologic conditions. While local floodplain management, stormwater management, and water quality regulations and policies address these changes on a site-by-site basis, their cumulative effects can result in floodplain impacts regardless. Additional growth in the County could contribute to increased localized flooding.

4.3.8. Severe Weather: Heavy Rains and Storms Vulnerability Assessment

Likelihood of Future Occurrence—Highly Likely
Vulnerability—High

According to historical hazard data, severe weather is an annual occurrence in Calaveras County. Damage and disaster declarations related to severe weather have occurred and will continue to occur in the future. Heavy rain and thunderstorms are the most frequent type of severe weather occurrences in the County. Wind, hail, and lightning often accompany these storms and have caused damage in the past. However, actual damage associated with the primary effects of severe weather has been limited. It is the secondary hazards caused by weather, such as floods, fire, and agricultural losses that have had the greatest impact on the County. The risk and vulnerability associated with these secondary hazards are discussed in other sections of this plan. According to CCWD representatives on the HMPC, all wastewater storage facilities are at risk during periods of heavy rains (Copper Cove, LaContenta, West Point, and Forest Meadows).

Future Development

New critical facilities should be built to withstand hail damage, lightning, and thunderstorm winds. While no damages have occurred to critical facilities in the past due to lightning, hail, or high winds and tornadoes, there still remains future risk. With development occurring in the region, future losses to new development may occur.

4.3.9. Severe Weather: Winter Weather and Freeze Vulnerability Assessment

Likelihood of Future Occurrence—Highly Likely
Vulnerability—High

Extreme cold and freeze can occasionally be accompanied by high winds, which can cause downed trees and power lines, power outages, accidents, and road closures. Transportation networks, communications, and utilities infrastructure are the most vulnerable physical assets in the County. The ability for the County to continue to operate during periods of winter storm and freeze is paramount. Although freeze can burst

pipes, freeze normally does not impact structures, but is a life safety issue. Vulnerable populations to freeze include:

- Homeless
- Infants and children under age five
- Elderly (65 and older)
- Individuals with disabilities
- Individuals dependent on medical equipment
- Individuals with impaired mobility

In addition to vulnerable populations, pets and livestock are at risk to freeze and cold. However many residents of Calaveras County are self-sufficient and accustomed to rural living and the climate extremes that are part of the territory. The residents of nursing homes and elder care facilities are especially vulnerable to extreme temperature events. It is encouraged that such facilities have emergency plans or backup power to address power failure during times of extreme cold.

Freeze can also affect farmers. Extended periods of cold/freeze can prevent trees from pollinating properly. However, during the winter/freeze months, many of the crops aren't even in the ground to be affected. High value crops, such as almond and citrus trees, can be severely damaged by freeze, causing large economic issues for farmers and the businesses they support.

Areas prone to excessively cold temperatures are identified normally on a nation-wide assessment scale, which doesn‘t allow detailed results on specific structures. Secondary impacts of freeze can affect the supporting mechanisms or systems of a community‘s infrastructure. For example, when extreme cold is coupled with high winds or ice storms, power lines may be downed, resulting in an interruption in the transmission of that power shutting down electric furnaces, which may lead to frozen pipes in homes and businesses.

Heavy snows can cause interruption in power, requiring facilities to run on generators several days in a row. A significant challenge is getting backup fuel to generators. Past storm events have knocked out power to multiple facilities at the same time. Recent snow events have resulted in 13 to 14 CCWD facilities running on generators for days.

Future Development

Future development built to code (for those areas with building codes) should be able to withstand snow loads from severe winter storms. Pipes at risk of freezing should be mitigated be either burying or insulating them from freeze as new facilities are improved or added. Vulnerability to extreme cold will increase as the average age of the population in the County shifts. Greater numbers of future senior citizens will result from the large number of baby boomers in the Planning Area. However, as previously mentioned, many of the residents of Calaveras County are self-sufficient and accustomed to rural living.

4.3.10. Wildfire Vulnerability Assessment

Likelihood of Future Occurrence—Highly Likely
Vulnerability—Extremely High

Risk and vulnerability to the Calaveras County planning area from wildfire is of significant concern, with some areas of the planning area being at greater risk than others as described further in this section. High fuel loads in the planning area, along with geographical and topographical features, create the potential for both natural and human-caused fires that can result in loss of life and property. These factors, combined with natural weather conditions common to the area, including periods of drought, high temperatures, low relative humidity, lightning, and periodic winds, can result in frequent and sometimes catastrophic fires. During the May to October fire season, the dry vegetation and hot and sometimes windy weather, combined with continued growth in the WUI areas, results in an increase in the number of ignitions. Any fire, once ignited, has the potential to quickly become a large, out-of-control fire. As development continues throughout the planning area, especially in these interface areas, the risk and vulnerability to wildfires will likely increase.

The wildfire hazard is the highest priority hazard in the County, and is the hazard with the greatest potential for catastrophic loss. Wildfires can cause short-term and long-term disruption to the County. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the County by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires may result in casualties and can destroy buildings and infrastructure.

Although the physical damages and casualties arising from wildland-urban interface fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. In some cases, the economic impact of this loss of services may be comparable to the economic impact of physical damages or, in some cases, even greater. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Fires can also cause major damage to power plants and power lines needed to distribute electricity to operate facilities.

Calaveras County Communities at Risk

The National Fire Plan is a cooperative, long-term effort between various government agency partners with the intent of actively responding to severe wildland fires and their impacts to communities while ensuring sufficient firefighting capacity for the future. For purposes of the National Fire Plan, the California Department of Forestry and Fire Protection (CAL FIRE) generated a list of California communities at risk for wildfire. The intent of this assessment was to evaluate the risk to a given area from fire escaping off federal lands. Three main factors were used to determine the wildfire threat in the wildland-urban interface areas of California: fuel hazards, probability of fire, and areas of suitable housing density that could create wildland urban interface fire protection strategy situations. The preliminary criteria and methodology for evaluating wildfire risk to communities is published in the Federal Register, January 4, 2001. The National Fire Plan identifies the following 35 “Communities at Risk” in Calaveras County in Table 4-53.

Table 4-53 Communities at Risk in Calaveras County

Community	Community	Community
Altaville	Dorrington	Rail Road Flat
Angels Camp	Douglas Flat	San Andreas
Arnold	Forest Meadows	Sandy Gulch
Avery	Ganns	Sheepranch
Big Meadow	Glencoe	Skyhigh
Big Trees	Hathaway Pines	Tamarack
Burson	Jenny Lind	Vallecito
Calaveritas	Milton	Valley Springs
Camp Connell	Mokelumne Hill	Wallace
Campo Seco	Mountain Ranch	West Point
Copperopolis	Murphys	Wilseyville
Cottage Springs	Paloma	

Source: California Fire Alliance

Assets at Risk

Unincorporated Calaveras County and the City of Angels Camp have mapped CAL FIRE fire severity areas. GIS was used to determine the possible impacts of wildfire within the County and how the wildfire risk varies across the planning area. The following methodology was followed in determining improved parcel counts and values by fire severity. Analysis on assets at risk to wildfire in the County is provided for two different areas in this base plan:

- Calaveras County Planning Area
- Unincorporated Calaveras County

The Calaveras County planning area includes both the unincorporated County and the City of Angels Camp, essentially the entire geographical area of Calaveras County. Summary tables for the planning area are presented below. For the unincorporated County, both summary and detail tables are shown and discussed below. Detail tables for the City of Angels Camp are included in the City's annex to this plan.

Methodology

As part of the Fire and Resource Assessment Program (FRAP), CAL FIRE was mandated to map areas of significant fire hazards based on fuels, terrain, weather, and other relevant factors. These zones, referred to as Fire Hazard Severity Zones (FHSZ), then define the application of various mitigation strategies to reduce risk associated with wildland fires.

Fire hazard is a way to measure the physical fire behavior so that people can predict the damage a fire is likely to cause. Fire hazard measurement includes the speed at which a wildfire moves, the amount of heat the fire produces, and most importantly, the burning fire brands that the fire sends ahead of the flaming front.

The fire hazard model developed by CAL FIRE considers the wildland fuels. Fuel is that part of the natural vegetation that burns during the wildfire. The model also considers topography, especially the steepness of the slopes. Fires burn faster as they burn up-slope. Weather (temperature, humidity, and wind) has a significant influence on fire behavior. The model recognizes that some areas of California have more frequent and severe wildfires than other areas. Finally, the model considers the production of burning fire brands (embers) how far they move, and how receptive the landing site is to new fires.

In 2007, CAL FIRE updated its fire hazard severity zone maps for the State of California to provide updated map zones, based on new data, science, and technology that will create more accurate zone designations such that mitigation strategies are implemented in areas where hazards warrant these investments. The zones will provide specific designation for application of defensible space and building standards consistent with known mechanisms of fire risk to people, property, and natural resources. The program is still ongoing with fire hazard severity zone maps being updated based on designated responsibility areas: State Responsibility Area (SRA) and Local Responsibility Area (LRA)

State Responsibility Area (SRA) was originally mapped in 1985 and Local Responsibility Areas (LRA) was originally mapped in 1996.

Responsibility Areas

CAL FIRE has a legal responsibility to provide fire protection on all SRA lands, which are defined based on land ownership, population density and land use. CAL FIRE is now also responsible for determining parcels subject to the SRA Fire Prevention Fee under AB X1 29. This dataset (SRA14_2) represents SRA status as of 7/1/14 and was used for the final determination of which parcels were potentially eligible for the fee. CAL FIRE's State Responsibility Area layer was used in this analysis to show Calaveras County's values, inventory and population by Federal Responsibility Area (FRA), SRA, and LRA. The FRA in the County is relatively small. The largest is the SRA, with almost 90 percent of the parcels in the County falling in the SRA. The LRA falls mainly in the City of Angels Camp. Locations of each responsibility area are shown in Figure 4-53. The FRA contains 787 parcels, none of which are improved. The SRA contains 37,722 parcels, with over $5.2 billion in total value. The LRA has 3,095 parcels with $564 million in total value. It should be noted that fire does not just affect structural values, fire can also affect land values. As such the Assessor's land values and all parcels were accounted for in this analysis to represent total county assets at risk. However, it is highly unlikely the whole County will ever be on fire at once. The County parcel inventory and associated values by responsibility area are provided in Table 4-54.

Figure 4-53 Calaveras County FRA, SRA, LRA Wildfire Areas

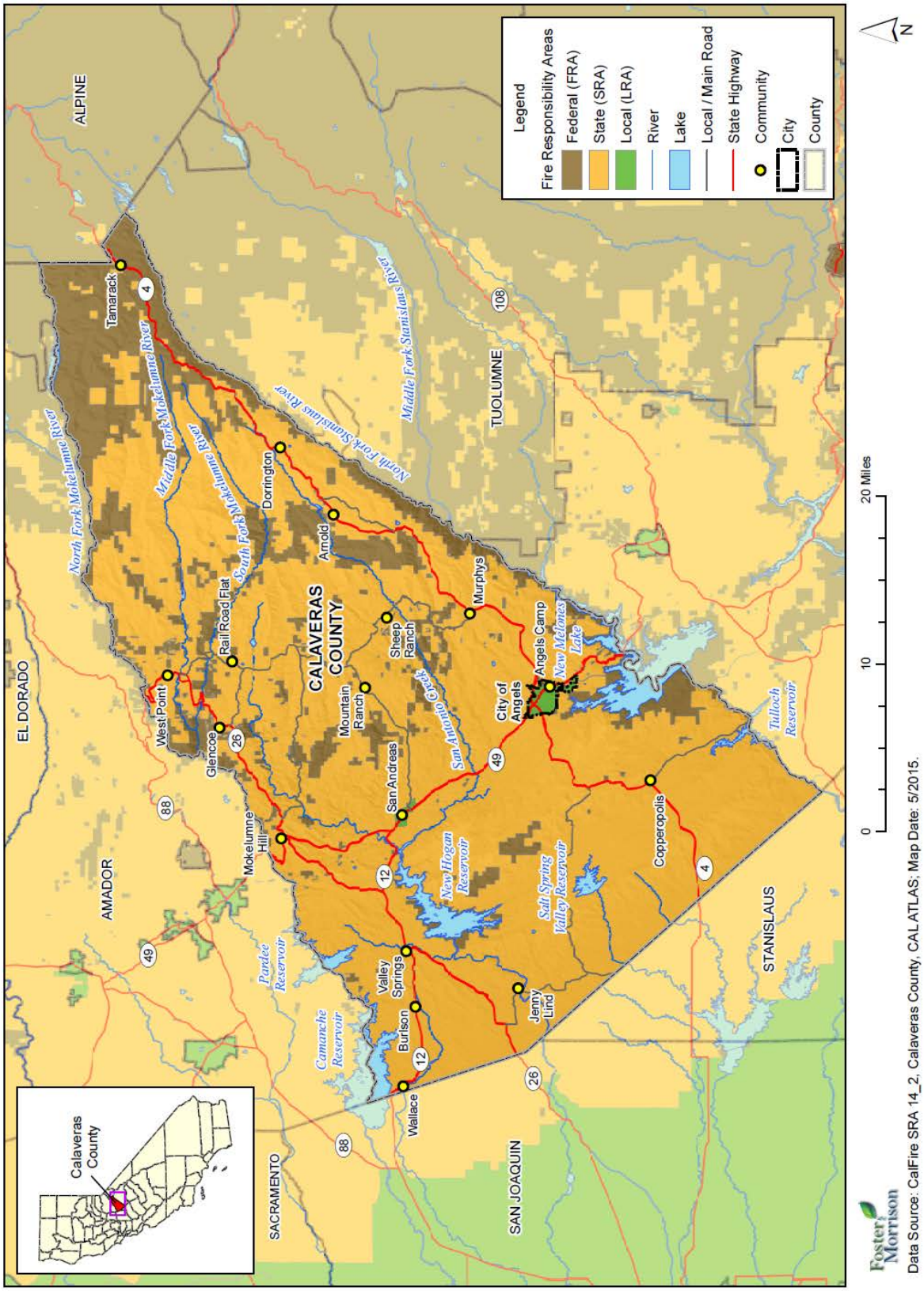


Table 4-54 Calaveras County Planning Area – Assets in Local, State, and Federal Responsibility Areas by Property Use

Property Use	Total Parcel Count	Total Land Value	Improved Parcel Count	Total Improved Value	Total Value*
Federal Responsibility Area					
Agricultural	28	$73,669	0	$0	$73,669
Commercial	1	$0	0	$0	$0
Institutional	474	$0	0	$0	$0
Other	276	$0	0	$0	$0
Residential	8	$0	0	$0	$0
Vacant Land	0	$0	0	$0	$0
Total	**787**	**$73,669**	**0**	**$0**	**$73,669**
State Responsibility Area					
Agricultural	8,344	$552,413,880	4,835	$ 724,793,464	$1,056,776,590
Commercial	450	$46,524,342	385	$ 133,968,342	$177,573,825
Institutional	113	$507,385	2	$ 178,475	$203,014
Other	2,637	$75,611,505	282	$ 65,546,632	$89,262,334
Residential	22,013	$705,774,083	18,513	$ 2,796,399,780	$3,397,435,286
Vacant Land	4,165	93,394,554	61	$ 5,492,418	$9,573,420
Total	**37,722**	**$1,474,225,749**	**24,078**	**$ 3,726,379,111**	**$5,200,604,860**
Local Responsibility Area					
Agricultural	42	$4,960,259	18	$ 2,706,580	$3,757,729
Commercial	241	$23,842,762	209	$ 81,487,858	$104,624,368
Institutional	21	$55,249	1	$105,476	$160,725
Other	270	$3,771,538	55	$ 14,411,563	$17,349,494
Residential	2,414	$103,989,557	1,997	$ 319,178,346	$408,143,559
Vacant Land	107	$9,059,371	5	$ 1,378,751	$2,558,077
Total	**3,095**	**$145,678,736**	**2,285**	**$ 419,268,574**	**$564,947,310**
Grand Total	**41,604**	**$1,619,978,154**	**26,363**	**4,141,542,615**	**5,761,520,769**

Source: Cal FIRE, Calaveras County Assessor's 2014 Data, Calaveras County Parcel Data 2013
*Land and structure values

Fire Hazard Severity Analysis

CAL FIRE mapped the SRA Fire Hazard Severity Zones (FHSZs), or areas of significant fire hazard, based on fuels, terrain, weather, and other relevant factors. Zones are designated with Very High, High, Moderate, Non-Wildland/Urban and Urban Unzoned hazard classes. The goal of this mapping effort is to create more accurate fire hazard zone designations such that mitigation strategies are implemented in areas where hazards warrant these investments. The fire hazard zones will provide specific designation for application

of defensible space and building standards consistent with known mechanisms of fire risk to people, property, and natural resources.

CAL FIRE also mapped the LRA Very High Fire Hazard Severity Zones (VHFHSZ). Mapping of these areas is based on data and models of potential fuels over a 30-50 year time horizon and their associated expected fire behavior, and expected burn probabilities to quantify the likelihood and nature of vegetation fire exposure (including firebrands) to buildings. The California Building Commission adopted California Building Code Chapter 7A requiring new buildings in VHFHSZs to use ignition resistant construction methods and materials. These new codes include provisions to improve the ignition resistance of buildings, especially from firebrands. The updated very high fire hazard severity zones will be used by building officials for new building permits in LRA. The updated zones will also be used to identify property whose owners must comply with natural hazards disclosure requirements at time of property sale and 100 foot defensible space clearance. It is likely that the fire hazard severity zones will be also used for updates to the safety element of general plans.

The combination of the FHSZ (fhszs06_3) dated December 2007 and the "Recommended" VHFHSZs (c11fhszl06_3) dated June 2008 layers yielded gaps in data for Calaveras County so the "Draft" FHSZ (fhszall06a1) dated August 2007 layer was used to supplement these areas to get a complete coverage of Fire Hazards.

Analysis was performed using these three datasets. Using GIS, the parcel layer were overlaid on the Recommended FHSZ and VHFHSZ and the Draft FHSZ layers. For the purposes of this analysis, if the parcel centroid intersects the zone's area, it will be assumed that the entire parcel is in that area. This analysis illustrates the Fire Hazard Severity Zones specific to the planning area.

Assets at Risk

Results are presented by total planning area, unincorporated county, and by the City of Angels Camp (in its annex to the plan), and detailed tables show improved parcel counts and their structure values by property use (residential, industrial, etc.) within each severity zone. According to the information in Table 4-55, almost all of the assets of the County fall in the moderate or higher fire severity category. Within Angels Camp, the entire City falls in the moderate or higher fire severity category.

Analysis results for the entire Calaveras County planning area are summarized in Table 4-55, which summarizes total parcel counts, improved parcel counts, and their improved and land values by property use, as well as the percentage of parcels affected by each fire severity zone. Table 4-56 breaks out the details of fire severity class and property use type for the unincorporated County. Fire severity is shown in Figure 4-54.

Figure 4-54 Calaveras County Planning Area Fire Severity Zones

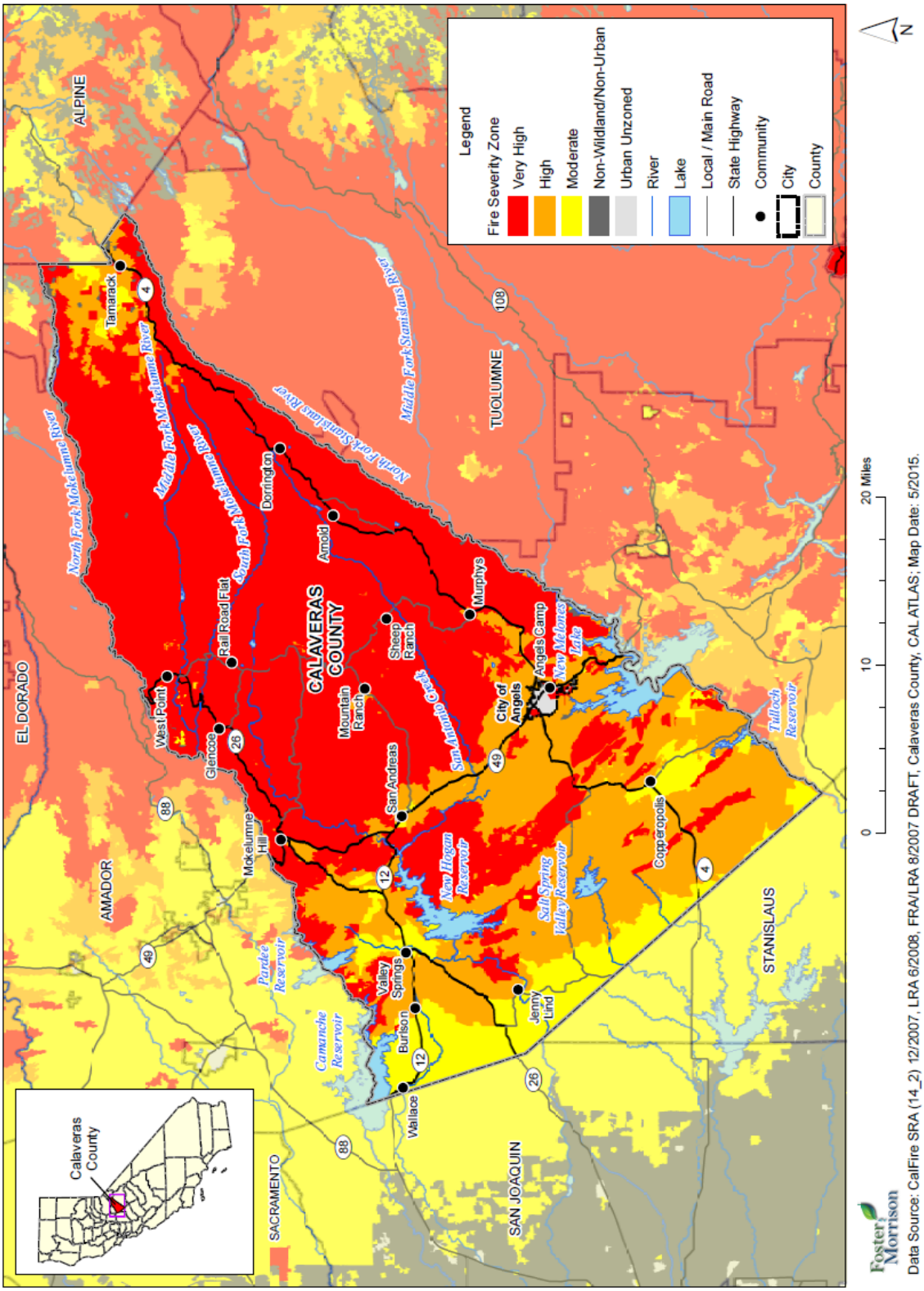


Table 4-55 Calaveras County Planning Area – Count and Value of Parcels by Jurisdiction and Fire Severity Zone

Fire Severity/ Jurisdiction	Total Parcel Count	Total Land Value	Improved Parcel Count	Improved Value	Total Value*	% of Affected Parcels to Total
Very High Fire Severity						
City of Angels Camp	81	$2,771,775	48	$5,636,911	$8,408,686	0.18%
Unincorporated	23,085	$803,649,237	14,752	$2,124,778,528	$2,928,427,765	55.96%
Total	**23,166**	**$806,421,012**	**14,800**	**$2,130,415,439**	**$2,936,836,451**	**56.14%**
High Fire Severity						
City of Angels Camp	0	$0	0	$0	$0	0.00%
Unincorporated	12,147	$512,879,194	7,527	$1,241,741,841	$1,754,621,035	28.55%
Total	**12,147**	**$512,879,194**	**7,527**	**$1,241,741,841**	**$1,754,621,035**	**28.55%**
Moderate Fire Severity						
City of Angels Camp	0	$0	0	$0	$0	0.00%
Unincorporated	4,019	$189,821,321	2,485	$451,748,717	$641,570,038	9.43%
Total	**4,019**	**$189,821,321**	**2,485**	**$451,748,717**	**$641,570,038**	**9.43%**
Non-Wildland/Non-Urban Fire Severity						
City of Angels Camp	2,151	$110,856,627	1,551	$321,741,688	$432,598,315	5.88%
Unincorporated	0	$0	0	$0	$0	0.00%
Total	**2,151**	**$110,856,627**	**1,551**	**$321,741,688**	**$432,598,315**	**5.88%**
Grand Total	**41,604**	**$1,619,978,154**	**26,363**	**$4,145,647,685**	**$5,765,625,839**	**100%**

Source: CAL FIRE, Calaveras County Assessor's 2014 Data; Calaveras County Parcel Data 2013
*Land and structure values

Table 4-56 Unincorporated Calaveras County – Count and Value of Parcels by Property Use and Fire Severity Zone

Fire Severity Zone	Property Use	Total Parcel Count	Total Land Value	Improved Parcel Count	Improved Value	Total Value*	% of Affected Parcels to Total
Very High	Agricultural	4,726	$275,779,793	2,659	$346,473,547	$622,253,340	10.7%
	Commercial	270	$22,401,640	231	$71,615,533	$94,017,173	0.9%
	Institutional	394	$294,559	1	$718	$295,277	0.00004%
	Other	1,695	$35,487,046	151	$33,000,403	$68,487,449	0.6%
	Residential	13,691	$419,083,557	11,679	$1,671,290,826	$2,090,374,383	47.2%
	Vacant Land	2,309	$50,602,642	31	$2,397,501	$53,000,143	0.1%

Fire Severity Zone	Property Use	Total Parcel Count	Total Land Value	Improved Parcel Count	Improved Value	Total Value*	% of Affected Parcels to Total
	Total	**23,085**	**$803,649,237**	**14,752**	**$2,124,778,528**	**$2,928,427,765**	**59.7%**
High	Agricultural	2,234	$179,169,396	1,176	$187,221,705	$366,391,101	4.7%
	Commercial	190	$17,638,086	162	$48,315,932	$65,954,018	0.7%
	Institutional	87	$172,736	1	$177,757	$350,493	0.00004%
	Other	874	$27,679,608	118	$33,966,976	$61,646,584	0.5%
	Residential	7,108	$252,854,260	6,044	$970,057,168	$1,222,911,428	24.4%
	Vacant Land	1,654	$35,365,108	26	$2,002,303	$37,367,411	0.1%
	Total	**12,147**	**$512,879,194**	**7,527**	**$1,241,741,841**	**$1,754,621,035**	**30.9%**
Moderate	Agricultural	1,415	$97,873,113	1,002	$191,212,814	$132,572,814	4.0%
	Commercial	91	$14,733,353	78	$41,830,041	$56,563,394	0.3%
	Institutional	24	$40,090	0	$0	$40,090	0.0%
	Other	414	$14,685,760	46	$6,916,497	$21,602,257	0.2%
	Residential	1,851	$53,102,749	1,353	$210,153,793	$77,030,177	5.5%
	Vacant Land	224	$9,386,256	6	$1,635,572	$11,021,828	0.002%
	Total	**4,019**	**$189,821,321**	**2,485**	**$451,748,717**	**$298,830,560**	**9.5%**
Non-Wildland/ Non-Urban	Agricultural	3	$0	0	$0	$0	0%
	Commercial	0	$0	0	$0	$0	0%
	Institutional	83	$0	0	$0	$0	0%
	Other	33	$0	0	$0	$0	0%
	Residential	1	$0	0	$0	$0	0%
	Vacant Land	1	$0	0	$0	$0	0%
	Total	**121**	**$0**	**0**	**$0**	**$0**	**0%**
Grand Total		**39,372**	**$1,506,349,752**	**24,764**	**$3,818,269,086**	**$5,324,618,838**	**100.00%**

Source: CAL FIRE, Calaveras County Assessor's 2014 Data; Calaveras County Parcel Data 2013
*Land and structure values

Population at Risk

The Fire Severity Zone dataset was overlayed on the parcel layer. Those residential parcel centroids that intersect the severity zones were counted and multiplied by the 2010 Census Bureau average household factors for each jurisdiction and unincorporated area. Results were tabulated by jurisdiction. According to this analysis, there is a total population of 47,173 residents of Calaveras County planning area at risk to wildfire. This is shown in Table 4-57. Table 4-58 shows a 43,875 population within the unincorporated

County. Population information relative to the wildfire hazard for the City of Angels Camp is provided in its Annex.

Table 4-57 Calaveras County Planning Area – Count of Improved Residential Parcels and Population by Fire Severity Zone

Fire Severity Zone	Improved Residential Parcels	Population*
Very High	12,572	28,916
High	6,577	15,127
Moderate	1,361	3,130
Non-Wildland/Urban	0	0
Total	**20,510**	**47,173**

Source: CAL FIRE, Calaveras County 2014 Assessor's Data; US Census Bureau
* Average household populations from the 2010 US Census were used: Calaveras County – 2.30; Angels Camp – 2.30.

Table 4-58 Unincorporated Calaveras County – Count of Improved Residential Parcels and Population by Fire Severity Zone

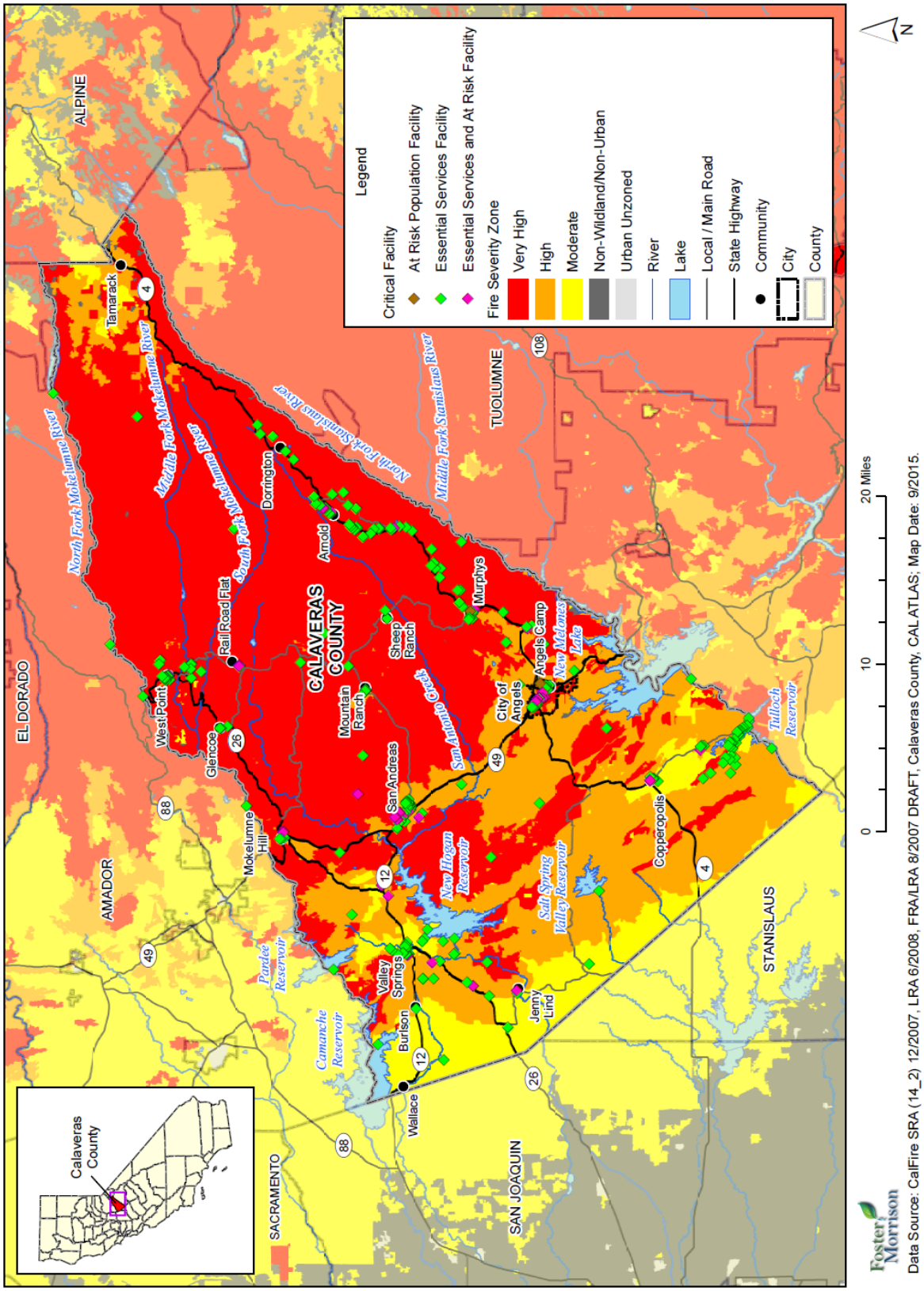
Fire Severity Zone	Improved Residential Parcels	Population*
Very High	11,679	26,862
High	6,044	13,901
Moderate	1,353	3,112
Non-Wildland/Urban	0	0
Total	**19,076**	**43,875**

Source: CAL FIRE, Calaveras County 2014 Assessor's Data; US Census Bureau
* Average household populations from the 2010 US Census were used: Calaveras County – 2.30; Angels Camp – 2.30.

Critical Facilities at Risk

Wildfire analysis was performed on the critical facility inventory in Calaveras County and all jurisdictions. GIS was used to determine whether the facility locations intersect a wildfire hazard areas provided by CAL FIRE, and if so, which zone it intersects. This is shown on Figure 4-55. There are 127 facilities in the very high fire severity zone, 121 facilities in the high fire severity zone, and 30 facilities in the moderate fire severity zone in the unincorporated County, as shown in Table 4-59. Details of critical facilities for Angels Camp can be found in its respective annex to this plan. Details of critical facility definition, type, name, address, and jurisdiction by fire severity zone are listed in Appendix F.

Figure 4-55 Unincorporated Calaveras County – Critical Facilities by Fire Severity Zone



Foster Morrison

Data Source: CalFire SRA (14_2) 12/2007, LRA 6/2008, FRA/LRA 8/2007 DRAFT, Calaveras County, CALATLAS; Map Date: 9/2015.

Table 4-59 Unincorporated Calaveras County – Critical Facilities by Fire Severity Zone

Fire Severity Zone	Category	Type	Facility Count
Very High	At Risk Population Facilities	Congregate Care Facility	1
	Essential Services Facilities	Communications	4
		Community Food Bank / Pantry	5
		Emergency Evacuation Shelter	11
		Emergency Medical	1
		Fire Station	20
		Government Operations	6
		Medical Health Facility	1
		Other Public Utility	3
		Police	3
		Power Utility	7
		Sewer Facility	1
		Transfer Station	5
		Transportation	1
		Veterans Post	2
		Waste Water Facility	16
		Water Facility	18
	Hazardous Materials Facilities	–	0
	At Risk Population and Essential Services Facilities	School / Emergency Shelter	22
	Total Very High		**127**
High	At Risk Population Facilities	Congregate Care Facility	1
	Essential Services Facilities	Communications	2
		Community Food Bank / Pantry	7
		Emergency Evacuation Shelter	10
		Emergency Medical	2
		Fire Station	12
		Government Operations	16
		Medical Health Facility	3
		Other Public Utility	1
		Police	3
		Power Utility	3

Fire Severity Zone	Category	Type	Facility Count
		Transfer Station	2
		Transportation	1
		Veterans Post	3
		Waste Water Facility	24
		Water Facility	12
	Hazardous Materials Facilities	–	0
	At Risk Population and Essential Services Facilities	School / Emergency Shelter	19
	Total High		**121**
Moderate	At Risk Population Facilities	Congregate Care Facility	1
		Community Food Bank / Pantry	2
		Emergency Evacuation Shelter	1
		Emergency Medical	1
		Fire Station	1
		Government Operations	1
		Medical Health Facility	3
		Other Public Utility	5
		Police	2
		Sewer Facility	1
		Solid Waste Facility	1
		Veterans Post	1
		Waste Water Facility	5
		Water Facility	3
	Hazardous Materials Facilities	–	0
	At Risk Population and Essential Services Facilities	School / Emergency Shelter	2
	Total Moderate		**30**
Non-Wildland/Non-Urban	At Risk Population Facilities	–	0
	Essential Services Facilities	Power Utility	2
	Hazardous Materials Facilities	–	0
	Multiple Categories	–	0
	Total Non-Wildland/Non-Urban		**2**

Source: Calaveras County GIS; CAL FIRE

Development Trends

The primary type of growth occurring in Calaveras County is rural residential development, which is often in the wildland-urban interface. This puts more people and property at risk, adds a new fuel source to vegetative fuels, and increases the fire protection challenges for local governments. The wildfire mitigation practices of surrounding land owners affects the fire risk of the each citizen and emphasizes the importance of education and partnerships regarding this shared responsibility.

Future Development GIS Analysis

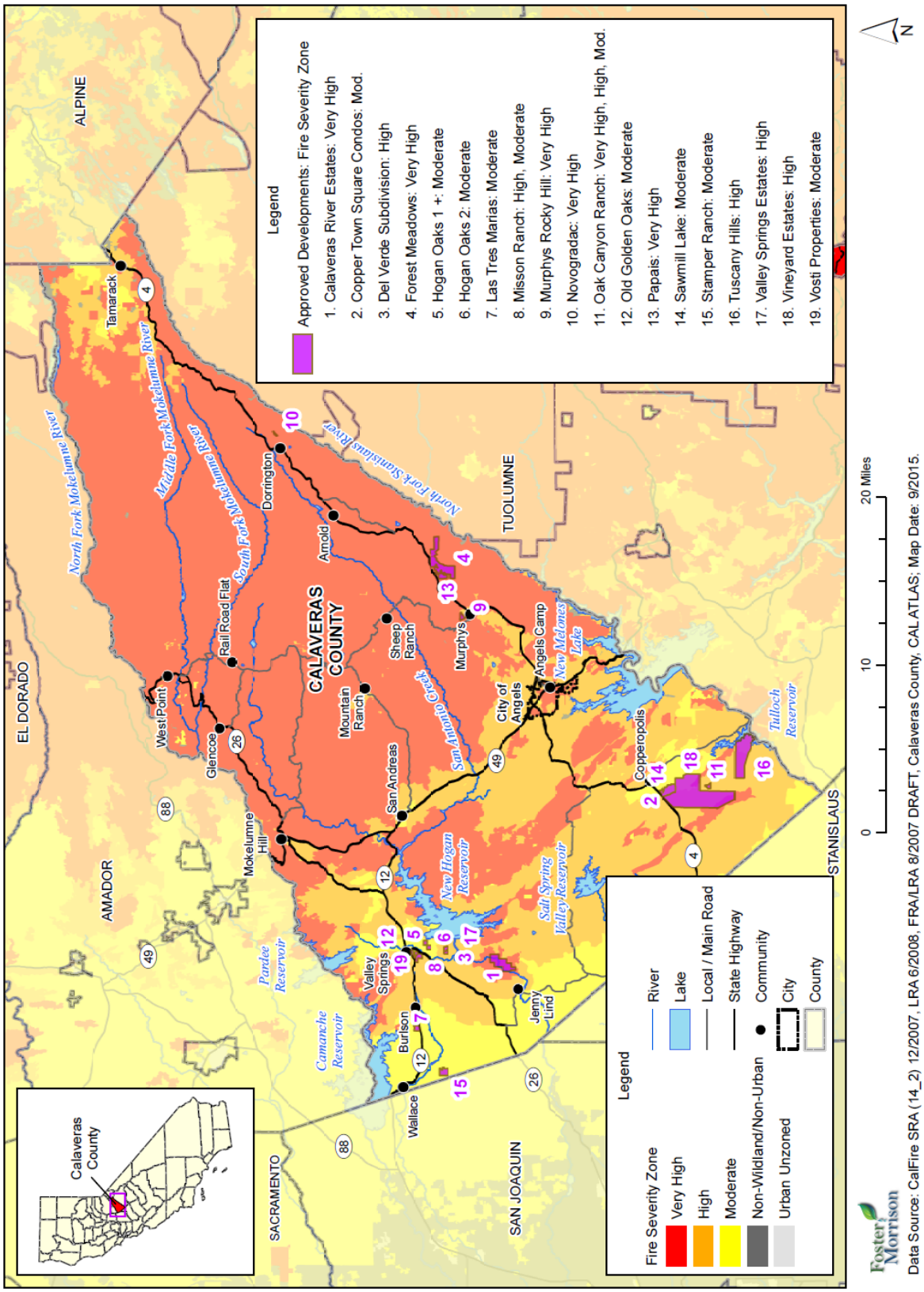
Future development areas were provided by Calaveras County. Analysis was performed by intersecting parcel centroids of the future development areas with CAL FIRE fire severity zones to provide a parcel level analysis of future development areas for the County. See Table 4-60 for an inventory of approved development projects and fire severity zones. These are also shown on Figure 4-56.

Table 4-60 Calaveras County Future Development by Fire Severity Zone

Approved Development Projects	# of Units	# of Parcels	Project Date	Acres	Fire Severity Zone
Calaveras River Estates	2	2	2006	494	Very High
Copper Town Square Condominiums	0	28	–	27	Moderate
Del Verde Subdivision	1	1	2005	40	High
Forest Meadows	852	852	–	876	Very High
Hogan Oaks 1 +	1	1	2002	37	Moderate
Hogan Oaks 2	1	1	2011	45	Moderate
Las Tres Marias	1	1	2004	79	Moderate
Misson Ranch	2	2	2006	81	High, Moderate
Murphys Rocky Hill	2	2	2007	47	Very High
Novogradac	2	2	2003	14	Very High
Oak Canyon Ranch	19	19	2000	3,242	Very High, High, Moderate
Old Golden Oaks	1	1	2006	28	High, Moderate
Papais	0	4	2014	37	Very High
Sawmill Lake	0	9	-	254	Moderate
Stamper Ranch	1	1	2003	133	Moderate
Tuscany Hills	1	1	2001	1,096	High, Moderate
Valley Springs Estates	1	1	1989	31	High
Vineyard Estates	1	1	2008	40	High
Vosti Properties	1	1	-	30	Moderate
Total	**889**	**930**	**–**	**6,632**	

Source: Calaveras County GIS

Figure 4-56 Calaveras County Future Development by Fire Severity Zone



4.4 Capability Assessment

Thus far, the planning process has identified the natural hazards posing a threat to the planning area and described, in general, the vulnerability of the County to these risks. The next step is to assess what loss prevention mechanisms are already in place. This part of the planning process is the mitigation capability assessment. Combining the risk assessment with the mitigation capability assessment results in the County's net vulnerability to disasters, and more accurately focuses the goals, objectives, and proposed actions of this plan.

The HMPC used a two-step approach to conduct this assessment for the County. First, an inventory of common mitigation activities was made through the use of a matrix. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken if deemed appropriate. Second, the HMPC conducted an inventory and review of existing policies, regulations, plans, and programs to determine if they contributed to reducing hazard-related losses or if they inadvertently contributed to increasing such losses.

This section presents the County's mitigation capabilities and discusses select state and federal mitigation capabilities that are applicable to the County. .

Similar to the HMPC's effort to describe hazards, risks, and vulnerability of the County, this mitigation capability assessment describes the District's existing capabilities, programs, and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This assessment is divided into four sections: regulatory mitigation capabilities are discussed in Section 4.4.1; administrative and technical mitigation capabilities are discussed in Section 4.4.2; fiscal mitigation capabilities are discussed in Section 4.4.3; and mitigation outreach and partnerships are discussed in Section 4.4.4. A discussion of other mitigation efforts follows in Section 0.

4.4.1. Calaveras County's Regulatory Mitigation Capabilities

Table 4-61 lists planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities, and indicates those that are in place in the County. Excerpts from applicable policies, regulations, and plans and program descriptions follow to provide more detail on existing mitigation capabilities.

Table 4-61 Calaveras County Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan	Y 2014 (Draft)	The plan addresses hazards in the following elements: Resource Production, Conservation and Open Space, Safety, and Public Facilities. The General Plan identifies goals and policies that are included in the mitigation strategy. The General Plan is used to implement the mitigation actions through the mitigation related policies set forth in the document.

Capital Improvements Plan		
Economic Development Plan		
Local Emergency Operations Plan	Y 2015 (Draft)	The EOP addresses the following hazards: earthquakes, floods, dam failure, wildland fires, landslides, extreme weather emergencies, haz-mat, and other man made hazards. The EOP addresses mitigation strategies and can be used to implement mitigation actions.
Continuity of Operations Plan		
Transportation Plan		
Stormwater Management Plan/Program		
Engineering Studies for Streams	Y 2010	The FIS addresses hazards specific to the County. It does not include projects or actions.
Community Wildfire Protection Plan	Y 2011	The plan addresses fire specifically. There are mitigation related projects identified in the plan.
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)	Y	There are multiple plans that identify hazards, contain mitigation strategies, and are used by the County to implement actions. The Calaveras County Terrorism Plan, Area Plan, Water Master Plan, Urban Water Management Plan, and TCU Pre-Fire Management Plan are examples of such planning mechanisms in force in the County.
Building Code, Permitting, and Inspections	**Y/N**	**Are codes adequately enforced?**
Building Code	Y	Version/Year: IBC 2012
Building Code Effectiveness Grading Schedule (BCEGS) Score		Score:
Fire department ISO rating:		Rating
Site plan review requirements		
Land Use Planning and Ordinances	**Y/N**	**Is the ordinance an effective measure for reducing hazard impacts?** **Is the ordinance adequately administered and enforced?**
Zoning ordinance	Y	The ordinance is effective in reducing hazard impacts. The zoning ordinance is administered and enforced.
Subdivision ordinance	Y	The ordinance is effective in reducing hazard impacts. The subdivision ordinance is administered and enforced.
Floodplain ordinance	Y	The ordinance is effective in reducing hazard impacts. The floodplain ordinance is administered and enforced.
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	Y Wildfire	Chapter 8.08 of the County Code is effective for reducing hazard impacts. It is administered and enforced.
Flood insurance rate maps	Y	The 2010 DFIRMs are effective. The rate maps are administered and enforced. Update to the FIRMs are in process and expected to be adopted by FEMA mid-2016
Elevation Certificates	Y	The Building Department does not issue Elevation Certificates. Property owners must retain the services of a Licensed Land Surveyor for the preparation of an Elevation Certificate. These are effective for reducing flood and other impacts. They are adequately administered and enforced.

Acquisition of land for open space and public recreation uses	
Erosion or sediment control program	
Other	
How can these capabilities be expanded and improved to reduce risk?	

As indicated in the table above, Calaveras County has several plans and programs that guide the County's mitigation of development of hazard-prone areas. Starting with the Calaveras County Draft General Plan, which is the most comprehensive of the County's plans when it comes to mitigation, some of these are described in more detail below.

Calaveras County Plans

Calaveras County Draft General Plan (2014)

The Calaveras County Draft General Plan is intended to guide growth and development in a way that balances the needs of the individual with the needs of all of the County's residents by encouraging economic growth; advocating the stewardship of the County's natural, scenic and recreational resources; providing a variety of housing choices for all income levels; promoting the orderly and cost-effective expansion of public infrastructure (thereby minimizing extraordinary demands on public services); and respecting the County's historical heritage. In guiding growth and development, the Draft General Plan recognizes that Calaveras County is made up of small communities, each with its own unique character and goals, surrounded by agricultural lands, working forests, wildlands, and large expanses of publicly managed forest and recreation lands. In guiding the County's future, the Draft General Plan seeks to promote economic prosperity, respect private property rights, and maintain Calaveras County's unique blend of the historic resources and innovative economic pursuits for all to live in, work among, and enjoy.

The plan includes seven elements: land use, circulation, housing, resource production, conservation and open space, noise, safety, and public facilities, and sets goals, policies, implementation measures, and related maps for each. Goals and policies related to mitigation from the Draft General Plan are the following:

Goals/Policy	Explanation
Resource Production Element	
Goal RP-1:	Long term viability and economic productivity of Resource Production Lands within the County.
Policy RP 1.1	Apply consistent evaluation criteria and mitigation for discretionary actions involving the conversion of resource production lands to non-resource production uses and/or for proposed land uses on or adjacent to active or potentially active resource production lands.
Policy RP 1.5	Support water and wastewater agencies and districts in the development and acquisition of short term and long term water supplies and the use of reclaimed and raw water on Resource Production Lands.

Goals/Policy	Explanation
Goal RP- 2	Long term viability of agricultural lands and resources within the County recognizing their economic, aesthetic, cultural, and other values.
Policy RP 2.1	Continue participation in the California Land Conservation Act of 1965 (Williamson Act/agricultural preserve program), and other agriculture-related long term conservation programs.
Policy RP 2.6	Promote a compatible relationship between agricultural and non-agricultural activities.
Conservation and Open Space Element	
Goal COS-1	High quality and abundant water resources.
Policy COS 1.1	Participate in regional, watershed-level and integrated resources management planning efforts to improve watershed health and water quality.
Policy COS 1.2	Protect the County's surface and ground water resources and watersheds from incompatible uses.
Goal COS-2	A diversity of native plants, fish, and wildlife species and their habitats.
Policy COS 2.3	Protect aquatic, wetland, and riparian habitats from the effects of erosion, siltation, encroachment, and alteration.
Policy COS 2.4	Require new development to identify and mitigate impacts to wetlands, riparian habitats and other aquatic resources consistent with state and federal regulations.
Safety Element	
Goal SAF-1	People, property, economy, and natural resources safe from the risks of natural and manmade hazards.
Policy SAF 1.1	Ensure that discretionary actions involving new development will not prevent the implementation of emergency response plans or the viability of evacuation routes established by local, state or federal agencies.
Policy SAF 1.2	Require new development to incorporate design features that minimize vulnerability to natural and man-made hazards.
Policy SAF 1.3	Ensure that discretionary actions involving new development will not result in a reduction in the pre-project levels of service provided by emergency responders.
Policy SAF 1.4	Evaluate the public costs that would be incurred if emergency or remedial actions become necessary prior to approving new development in identified hazardous areas.
Policy SAF 1.5	Require new development to provide for the long-term maintenance and operation of essential facilities installed in conjunction with the new development during emergency situations (e.g. channel maintenance or debris removal adjacent to bridges along critical evacuation routes).
Policy SAF 1.6	Require new development to identify, and have available, an emergency water supply sufficient to maintain a minimum three day water supply to serve the development during emergency situations.
Policy SAF 1.7	Streamline the permitting process for the provision of communications systems to enhance emergency response and for post-disaster recovery.
Policy SAF 1.8	Locate new essential public facilities, utilities, and services away from identified hazard areas.
Policy SAF 1.9	Coordinate planning efforts between local, state and federal public safety and law enforcement agencies; the community; and other stakeholders to ensure cooperative, efficient and effective planning to minimize the risks associated with natural and manmade hazards.
Policy SAF 1.10	Continue to make available public education materials to assist residents and visitors in planning and responding to emergency situations.
Goal SAF-2	Communities protected from unreasonable risks of death, injuries, property damage and economic and social dislocation resulting from floods, including flooding caused by seiches and dam failure.

Goals/Policy	Explanation
Policy SAF 2.1	Apply consistent development standards for new development proposed in designated flood hazard zones, or areas identified by a qualified professional as flood-prone, to reduce potentially significant adverse impacts related to flooding.
Policy SAF 2.2	Deny discretionary or ministerial entitlements that place people or property at risk within identified flood hazard zones unless (1) findings can be made in accordance with California Government Code Section 65962(a) and (2) measures are identified and implemented to minimize flood hazards prior to occupancy.
Policy SAF 2.3	Ensure that post-development, off-site peak flow drainage from the area being developed does not exceed pre-development peak flow drainage.
Goal SAF-3	Communities protected from unreasonable risks of death, injuries, property damage and economic and social dislocation resulting from fires.
Policy SAF 3.1	Apply consistent standards for new development commensurate with the severity of the fire hazard as reflected in designated fire hazard zones and as necessary to reduce potentially significant adverse impacts related to structural (urban) and wildland fires.
Policy SAF 3.2	Ensure that new development, including essential public facilities, complies with adopted fire codes and standards for fire protection.
Policy SAF 3.	3 Review new development proposals in coordination with CAL FIRE and individual fire districts to ensure that impacts to fire protection districts are identified and, where necessary, require new development, including essential public facilities, to mitigate those impacts consistent with state law.
Policy SAF 3.4	All new development shall meet any applicable standards for access by emergency vehicles and egress by residents.
Policy SAF 3.5	Include professional fire planning experts, to the maximum extent feasible, in the planning review process for projects located in High and Very High Fire Hazard Areas to consistently evaluate fire safe design, potential impacts related to fire safety, and to identify effective measures to minimize potential impacts related to wildland fire.
Policy SAF 3.6	The County shall support the review and update of fire district impact fees to adequately fund minimum levels of service and staffing to meet the fire protection needs of existing and future residents and businesses.
Goal SAF 3.6	The County shall support the review and update of fire district impact fees to adequately fund minimum levels of service and staffing to meet the fire protection needs of existing and future residents and businesses.
Policy SAF 4.1	Require new development to demonstrate that the site is physically suitable for the project and that projects will neither create nor significantly contribute to geological instability and will not unreasonably expose people or property to geological hazards.
Policy SAF 4.2	Avoid extreme topographic modification, and restore natural contours and vegetation after grading and other land disturbances in conjunction with new development.
Policy SAF 4.3	Require new development on land with grades of 20% or steeper to demonstrate during the discretionary review process that the project can adequately control surface water runoff, erosion, and other potential geologic hazards.
Policy SAF 4.4	Locate high occupancy structures and essential public facilities outside of identified geological hazard zones unless they can meet design standards eliminating or minimizing risks associated with geological hazards to a level of less-than-significant.
Policy SAF 4.5	Require site-specific geological studies, where warranted, to verify the presence or absence and extent of geological hazards on properties proposed for new development and to identify measures to reduce those hazards to an acceptable level in conjunction with the review of discretionary entitlements and as part of review of ministerial permits in accordance with California Building Code.

Goals/Policy	Explanation
Goal SAF-5	Communities protected from unreasonable risks of death, injuries, property damage and economic and social dislocation resulting from the use, transport, treatment and disposal of hazardous materials and wastes.
Policy SAF 5.1	Evaluate proposed new development for potential long-term risks related to hazardous materials to people, property, existing and planned land uses in the vicinity of the proposed use.
Policy SAF 5.2	Work cooperatively with local, state and federal agencies to manage the use, transport, treatment and disposal of hazardous materials.
Policy SAF 5.3	Strive to maintain the County's Certified Unified Program Agency (CUPA) "No deficiencies observed" status.
Policy SAF 5.4	Require new development to incorporate adequate separation between areas using or storing hazardous materials and sensitive land uses
Goal PF–2	Adequate water, water storage capacity, fire flow, and wastewater treatment for new and existing development, with no decline in service levels to existing County residents.
Public Facilities Element	
Policy PF 2.1	Require new development and expansions of existing developments to demonstrate that sufficient water supply and wastewater capacity exist to support the proposal.
Policy PF 2.4	Design new development to encourage groundwater recharge in appropriate locations.
Policy PF 2.5	Protect ground and surface water quality.
Policy PF 2.7	Encourage regional collaboration between water and wastewater providers in the West County, including efforts to reduce reliance on well water.
Goal PF-5	A community prepared for, able to respond to, and able to recover from the effects of natural and manmade disasters and other emergencies.
Policy PF-5.1	Support and encourage interagency coordination and cooperation in response to disaster and emergency situations.
Policy PF-5.2	Maintain an effective Emergency Operations Plan to address large scale emergencies and natural disasters.

The Draft General Plan also includes the following individual community plans: Arnold Community Plan, Avery/Hathaway Pines Community Plan, Copperopolis Community Plan, Mokelumne Hill Community Plan, Mountain Ranch Community Plan, Murphys/Douglas Flat Community Plan, Paloma Community Plan, Railroad Flat – Glencoe Community Plan, Rancho Calaveras Community Plan, San Andreas Community Plan, Sheep Ranch Community Plan, Valley Springs Community Plan, Wallace Community Plan, West Point Community Plan, and Wilseyville Community Plan.

Calaveras County Mass Fatality Plan

The Calaveras County Mass Fatality Plan establishes the policies, responsibilities, and procedures required to serve the needs of Calaveras County populace during incidents that result in significant loss of life. This plan establishes the emergency response organization for mass fatality incidents occurring within Calaveras County. This plan also establishes the operational concepts and procedures.

Calaveras County Terrorism Plan

The Calaveras County Terrorism Plan establishes a concept of operations for Calaveras County consequence management of a Weapons of Mass Destruction (WMD) or terrorist incident. This plan provides the basic field ICS and Emergency Operations Center SEMS (standardized emergency management system) guidance for actions to take for terrorist situations analysis, initial response, extended response, recover, and mitigation (awareness and prevention). This plan provides direction on how to integrate with federal agencies during crisis management.

Calaveras County Emergency Operations Plan (EOP)

This multi-hazard functional plan outlines the functions, responsibilities, and regional risk assessments of Calaveras County for large scale emergencies (i.e. wildland fires, hazardous materials incidents, flooding, dam failure, light airplane crashes, etc.). This Plan sets forth an operating strategy for managing these incidents. The EOP addresses the planned response to extraordinary emergency situations associated with natural disasters, technological incidents, and national security emergencies in or affecting the County of Calaveras. The plan establishes a flexible, all hazards, emergency management organization required to facilitate the response to, and provide for short term recovery activities related to any significant emergency or disaster affecting Calaveras County. The plan further identifies the policies, responsibilities and procedures required to protect the health and safety of Calaveras County communities, public and private property and the environmental effects of natural and technological emergencies and disasters. It establishes the operational concepts and procedures associated with Initial Response Operations (field response) to emergencies, the Extended Response Operations (County Emergency Operations Center (EOC) activities) and the recovery process.

Calaveras County Area Plan

The Area Plan, a.k.a. the Calaveras County Operational Area Hazardous Materials Emergency Response Plan, establishes the policies, responsibilities, and procedures required to protect the health and safety of Calaveras County's populace, the environment, and public and private property from the effects of hazardous materials incidents.

Calaveras County Community Wildfire Protection Plan, 2011

The purpose of this plan is to identify the risks and hazards associated with wildland fires in the wildland urban interface (W.U.I.) areas of Calaveras County. The plan also identifies recommendations aimed at preventing and reducing both infrastructure and ecosystem damage associated with wildland fires. The Calaveras County Community Wildfire Protection Plan is intended to reduce the risk to people, property and the environment. Fuel reduction projects identified in an approved C.W.P.P. receive priority for federal funds.

Tuolumne-Calaveras Unit Pre-Fire Management Plan, 2011

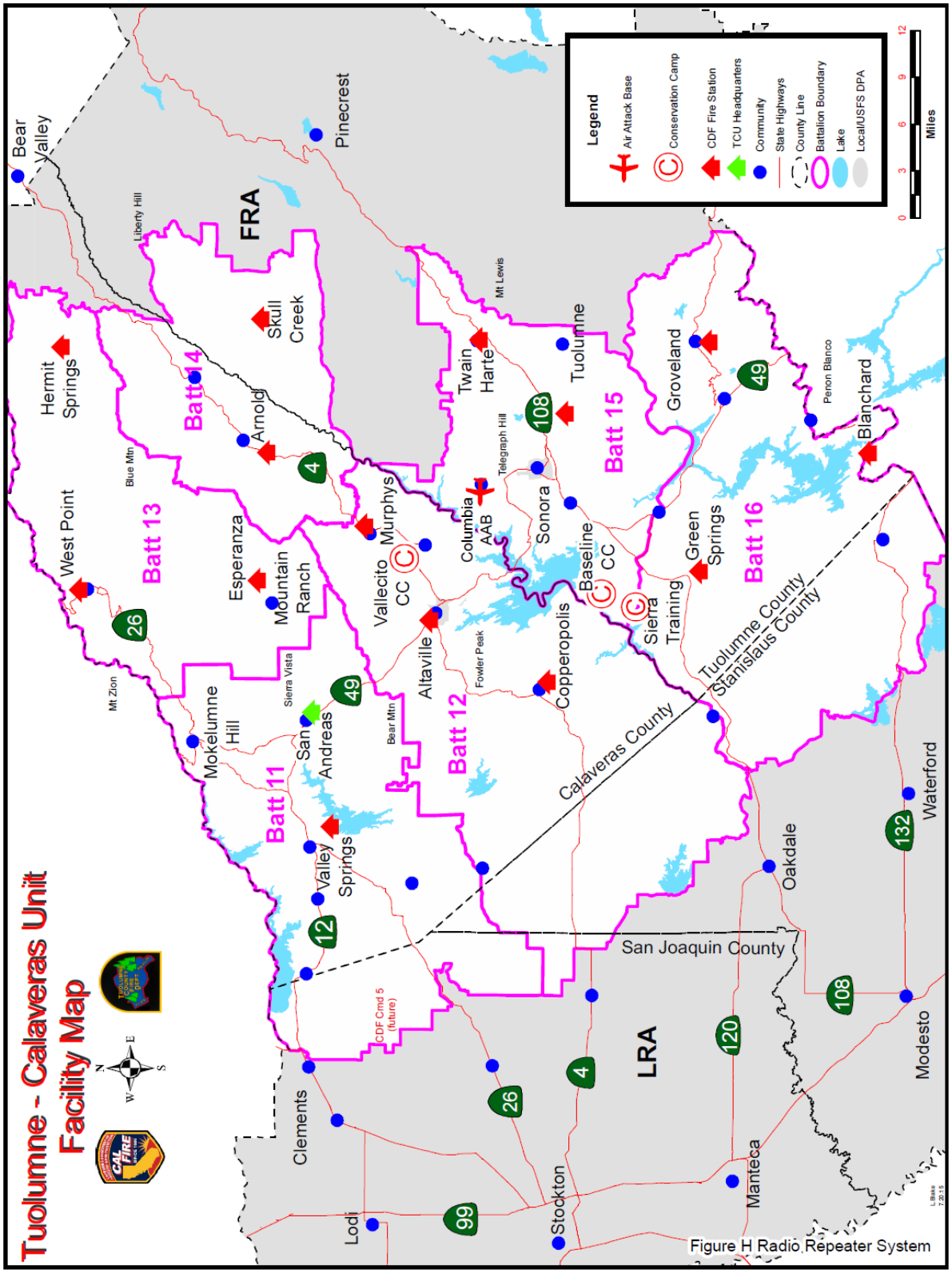
The TCU of CDF developed this plan which combines all of the TCU's pre-fire components into one document and also serves as the Community Wildfire Protection Plan for all communities in Calaveras

County. The plan provides an excellent assessment of wildfire risk and capabilities in the TCU, including GIS analysis and maps. Pre-fire management projects are identified for both the entire unit and for each of the six battalions. The plan also documents the activities of the Calaveras Foothills Fire Safe Council.

The TCU plan identifies watersheds and water utilities as critical assets at risk to wildfire. The County should integrate their wildfire mitigation strategy with projects identified in the TCU plan to the extent possible and consider further involvement with the Fire Safe Council in the future.

A map of TCU facilities in the County to support firefighting is included in Figure 4-57.

Figure 4-57 TCU Facility Map



County Water Master Plan, 1996

The water master plan is a countywide plan that guides the development and management of the county's water resources. The plan summarizes the water supplies needed for meeting the county's projected water demands and prioritizes the principal tasks for ensuring highly reliable water supplies. This plan and the Urban Water Management Plan described below provide the framework for drought mitigation and response activities.

Urban Water Management Plan, 2011

California's Urban Water Management Act requires water utilities of a specified size to prepare an Urban Water Management Plan to promote water conservation and efficient water use. The plans should evaluate water supply during normal, single dry, and multiple dry years and be updated every five years. In 2010/2011, the CCWD developed a draft update to their 2005 plan. The plan includes water demand management measures currently being implemented or planned, many of which mitigate drought. Measures include school and public education programs and incentive programs for high-efficiency washing machines and toilets, among others.

Within the water management plan is a Water Shortage Contingency Plan (Appendix D to that plan), which plans for water shortage emergency response and a water conservation program with voluntary and mandatory rationing depending on the severity and anticipated duration of the water supply emergency. The CCWD has also established and used short-term water transfer arrangement to address water supply shortages.

Mokelumne/Amador/Calaveras Integrated Regional Water Management Plan Update (2007)

This document has been created by agencies and organizations within the Mokelumne, Amador, and Calaveras watershed region to better manage existing resources and plan for future conditions. The integrated regional water management plan reflects the region's diversity and goals for ensuring a reliable water supply, reduction in flood-related impacts, and preservation of water quality and the environment.

Multi-Agency Coordinating Group

The Multi-Agency Coordinating (MAC) Group is an emergency management team composed of the major jurisdictional representatives in Calaveras County, who are responsible for responding to and managing broad-based emergency events. Other participants include the following:

- Calaveras County Administration
- Calaveras County OES (acts as the MAC coordinator)
- Calaveras County Sheriff's Office
- Calaveras County Fire Departments
- Calaveras County Water District
- CAL FIRE
- Pacific Gas & Electric
- CalTrans

- Calaveras County Water District (liaison for all wastewater and utility agencies in the County)
- Angels Camp Police Department
- California Highway Patrol
- U.S. Forest Service
- Calaveras Works and Human Services
- Calaveras County Health Department

Calaveras County Ordinances

The Calaveras County Draft General Plan provides policy direction for land use, development, open space protection, and environmental quality; however, this policy direction must be carried out through numerous ordinances, programs, and agreements. The following ordinances are among the most important tools for implementing the Draft General Plan and/or are critical to the mitigation of hazards identified in this plan.

Title 2 Administration and Personnel; Chapter 2.72 Disaster Council

This chapter establishes a County Disaster Council, which has three primary purposes. The first is to provide for the preparation and carrying out of plans that will protect County residents and property in the event of an emergency. The second function of the Disaster Council is to provide direction for the County's emergency organization. The third purpose is to coordinate the emergency functions of the county with all other public agencies, corporations, organizations, and affected private persons. The ordinance establishes the authority of the Disaster Council director and assistant director, and the responsibility of the Council for the development of the County emergency plan.

Title 8 Health and Safety; Chapter 8.08 Hazardous Fire Areas

The intent of this chapter is to provide some of the necessary safeguards to prevent the occurrence of fires which might be caused by recreational, residential, commercial, industrial or other activities conducted in any hazardous fire area. The unrestricted use of grass, grain, brush or forest-covered land in hazardous fire areas is a potential menace to life and property from fire and resulting erosion.

This code ordinance establishes a definition for 'Hazardous fire area' and the requirement that a map of hazardous fire areas shall be maintained by the county fire warden. The county fire warden has the authority under this code to restrict entry into properties deemed unsafe due to wildfire hazard. Smoking prohibitions, open flame device restrictions, outdoor fires, disposal of ashes, illegal use of fire roads or firebreaks, and use of motor vehicles in hazardous fire areas are all regulated under this county code section and penalties for violations are also established.

Title 15 Buildings and Construction; Chapter 15.04 Uniform Codes

This code is applied as the exclusive source of regulations for all new construction and any alterations, repairs, relocations, or reconstruction of any building or any portion of any building within the jurisdictional purview of the County. It dictates that in the event that the building code conflicts with a law or regulation of the state of California, whichever requirement establishes the higher standard of safety shall govern.

This code chapter includes findings relating to potentially hazardous conditions endemic to the planning area, including considerations for snow load (winter storms), seismic activity (earthquake), liquefaction (land subsidence/earthquake), slope instability (landslide), expansive soils and flood hazards.

Title 15 Buildings and Construction; Chapter 15.05.090 Engineered Grading

This code chapter outlines the allowable grading activities in the County. Through this chapter, the code sets forth the regulatory authority to mitigate potential hazards including landslide, erosion, rockfall, and flooding; as indicated in the following table which outlines the code structure.

Table 4-62 Chapter 15.05.090 Engineered Grading, Stipulations and Conditions

Stipulation	Condition
A. A nonexempt grading project is subject to the requirements specified in the manual for "engineered grading" if it includes any of the following:	1. Grading in excess of one thousand cubic yards;
	2. Finished grades that are steeper than two units horizontal for one unit vertical;
	3. Fill of greater than five feet in height on natural ground with a slope greater than three units horizontal for one unit vertical;
	4. Cut or fills of more than ten feet;
	5. Earthwork within the public right-of-way;
	6. Grading for construction of a public or private road;
	7. Fills that are intended to support structures for which a building permit is required;
	8. Extensive storm drain collection system with inlet structures; or
	9. Earthwork within a flood plain as shown on the most recent FEMA flood plan maps.
B. Engineered grading requirements shall also apply if the proposed work, as determined by the director, has the potential to:	1. Endanger public health, safety or welfare;
	2. Obstruct or alter any water course or adversely impact existing drainage facilities;
	3. Threaten the stability of a public or private road or adjacent structures or property;
	4. Exacerbate existing downstream flood conditions; or
	5. Degrade receiving water without implementation of engineered controls.
C. For engineered grading projects, a professional engineer shall be responsible for project design and shall provide all required professional services as described in the manual including the preparation of a construction quality assurance plan and, upon work completion, certification that all work has been done in substantial conformance to the approved engineered grading plan and all associated grading permit requirements.	

Source: Calaveras County Code, Title 15 Buildings and Construction; Chapter 15.05.090 Engineered Grading; (Ord. 2929 § 1(part), 2007)

The following publications are adopted by reference and incorporated in this code, except as expressly amended or superseded by the provisions of this chapter.

- International Building Code, 2012 edition, as published by the International Code Council as adopted and amended by the California Building Standards Commission, California Building Standards Code, Title 24 of the California Code of Regulations including the following appendices:
  - ✓ Appendix Chapter C: Group U-Agricultural Buildings;
  - ✓ Appendix Chapter G: Flood Resistant Construction;
  - ✓ Appendix Chapter H: Signs;
  - ✓ Appendix Chapter I: Patio Covers.
- California Residential Code, 2012 edition, as published by the International Code Council and as adopted and amended by the California Building Standards Commission in the California Building Standards Code, Title 24 of the California Code of Regulations.
- California Electrical Code, 2014 edition, as published by the National Fire Protection Association, and as adopted by the California Building Standards Commission in Title 24 of the California Code of Regulations.
- California Mechanical Code, 2012 edition, as published by the International Association of Plumbing and Mechanical Officials, and as adopted by the California Building Standards Commission in Title 24 of the California Code of Regulations.
- California Plumbing Code, 2012 edition, as published by the International Association of Plumbing and Mechanical Officials, and as adopted by the California Building Standards Commission in Title 24 of the California Code of Regulations, including the following appendix:
  - ✓ Appendix G: Gray Water Systems.
- California Fire Code, 2012 edition, as published by the International Code Council and as adopted and amended by the California Building Standards Commission in the California Building Standards Code, Title 24 of the California Code of Regulations.
- California Property Maintenance Code, 2012 edition, as published by the International Code Council.
- California Housing Code, 2010 edition, as published by the International Conference of Building Officials and as adopted and amended by the California Building Standards Commission in the California Building Standards Code, Title 25 of the California Code of Regulations.
- California Green Standards Building Code, 2012, the residential mandatory measures in the California Building Standards Code, Title 24 of the California Code of Regulations, Part 11.

Title 15 Buildings and Construction; Chapter 15.06 Flood Damage Prevention

The flood hazard areas of Calaveras County are subject to periodic inundation which results in loss of life and property, health and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures for flood protection and relief, and impairment of the tax base, all of which adversely affect the public health, safety, and general welfare. These flood losses are caused by uses that are inadequately elevated, flood proofed, or protected from flood damage. The cumulative effect of obstructions in areas of special flood hazards which increase flood heights and velocities also contribute to the flood loss. The purpose of this chapter is to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed to:

- Protect human life and health;

- Minimize expenditure of public money for costly flood control projects;
- Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
- Minimize prolonged business interruptions;
- Minimize damage to public facilities and utilities such as water and gas mains; electric, telephone and sewer lines; and streets and bridges located in areas of special flood hazard;
- Help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future blighted areas caused by flood damage;
- Ensure that potential buyers are notified that property is in an area of special flood hazard; and
- Ensure that those who occupy the areas of special flood hazard assume responsibility for their actions. (Ord. 2294 (part), 1992).

In order to accomplish its purposes, this chapter includes regulations to:

- Restrict or prohibit uses which are dangerous to health, safety and property due to water or erosion hazards, or which result in damaging increases in erosion or flood heights or velocities;
- Require that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;
- Control the alteration of natural floodplains, stream channels and natural protective barriers, which help accommodate or channel floodwaters;
- Control filling, grading, dredging and other development which may increase flood damage; and
- Prevent or regulate the construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards in other areas.

This chapter shall apply to all areas of special flood hazards within the jurisdiction of the County of Calaveras. The areas of special flood hazard identified by the Federal Emergency Management Agency (FEMA) in the "Flood Insurance Study (FIS) for Calaveras County Unincorporated Areas" dated September 5, 1990, with accompanying Flood Insurance Rate Maps (FIRMs) and Flood Boundary and Floodway Maps (FBFMs), dated September 5, 1990, and all subsequent amendments and/or revisions, are hereby adopted by reference and declared to be a part of this chapter. This Flood Insurance Study and attendant mapping is the minimum area of applicability of this chapter and may be supplemented by studies for other areas which allow implementation of this chapter and which are recommended to the board of supervisors by the floodplain administrator.

Methods for reducing flood losses under this chapter include the requirement that land uses that are vulnerable to floods must be protected against flood damage at the time of initial construction, to avoid the need to retrofit substandard construction in the future and to control filling, grading, dredging and other development that may increase flood damage elsewhere. The chapter provides definitions and describes the basis for establishing areas of special flood hazard (those identified by FEMA on a Flood Insurance Study or Flood Insurance Rate Maps. Duties and responsibilities of the floodplain administrator and standards for construction of structures, utilities, subdivisions and manufactured homes are detailed. Special rules regarding floodways are also outlined that prohibit most uncertified encroachments.

In all areas of special flood hazards the following standards are required:

A. Anchoring.

1. All new construction and substantial improvements of structures, including manufactured homes, shall be adequately anchored to prevent flotation, collapse or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy.

2. All manufactured homes shall meet the anchoring standards of Section 15.06.054.

B. Construction Materials and Methods. All new construction and substantial improvement, including manufactured homes, shall be constructed:

1. With flood resistant materials, and utility equipment resistant to flood damage for areas below the base flood elevation;

2. Using methods and practices that minimize flood damage;

3. With electrical, heating, ventilation, plumbing and air conditioning equipment and other service facilities that are designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding; and.

4. Within zones AH or AO, so that there are adequate drainage paths around structures on slopes to guide flood waters around and away from proposed structures.

C. Elevation and Floodproofing. (See Section 15.06.020 definitions for "new construction," "substantial damage" and "substantial improvement.")

1. Residential construction. All new construction or substantial improvements of residential structures shall have the lowest floor, including basement:

a. In AE, AH, A1-30 zones, elevated two feet above the base flood elevation.

b. In an AO zone, elevated above the highest adjacent grade to a height two feet above the depth number specified in feet on the FIRM, or elevated at least four feet above the highest adjacent grade if no depth number is specified.

c. In an A zone, without BFE's specified on the FIRM [unnumbered A zone], elevated two feet above the base flood elevation; as determined under subsection 15.06.042C.

Upon completion of the structure, the elevation of the lowest floor, including basement, shall be certified by a registered civil engineer or licensed land surveyor, and verified by the community building inspector to be properly elevated. Such certification or verification shall be provided to the floodplain administrator.

2. Nonresidential construction. All new construction or substantial improvements of nonresidential structures shall either be elevated to conform with subsection 15.06.051C.1. or:

a. Be floodproofed, together with attendant utility and sanitary facilities, below the elevation recommended under subsection 15.06.051.C.1. so that the structure is watertight with walls substantially impermeable to the passage of water;

b. Have structural components capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy; and

c. Be certified by a registered civil engineer or architect that the standards of this subsection 15.06.051C.2.a. and b. are satisfied. Such certification shall be provided to the floodplain administrator.

3. Flood openings. All new construction and substantial improvements of structures with fully enclosed areas below the lowest floor (excluding basements) that are usable solely for parking of vehicles, building access or storage, and which are subject to flooding, shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exits of floodwater. Designs for meeting this requirement must exceed the flooding minimum criteria:

a. For non-engineered openings:

1. Have a minimum of two openings on different sides having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding;

2. The bottom of all openings shall be no higher than one foot above grade;

3. Openings may be equipped with screens, louvers, valves or other coverings or devices provided that they permit the automatic entry and exit of floodwater; and

4. Buildings with more than one enclosed area must have openings on exterior walls for each area to allow flood water to directly enter; or

b. Be certified by a registered civil engineer or architect.

4. Crawlspace Construction. This subsection applies to buildings with crawl spaces up to two feet below grade. Below-grade crawl space construction in accordance with the requirements listed below will not be considered basements.

a. The building must be designed and adequately anchored to resist flotation, collapse, and lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy. Crawl space construction is not allowed in areas with flood velocities greater than five feet per second unless the design is reviewed by a qualified design professional, such as a registered architect or professional engineer;

b. The crawl space is an enclosed area below the BFE and, as such, must have openings that equalize hydrostatic pressures by allowing for the automatic entry and exit of floodwaters. For guidance on flood openings, see FEMA Technical Bulletin 1-93;

c. Crawl space construction is not permitted in V zones. Open pile or column foundations that withstand storm surge and wave forces are required in V zones;

d. Portions of the building below the BFE must be constructed with materials resistant to flood damage. This includes not only the foundation walls of the crawl space used to elevate the building, but also any joists, insulation, or other materials that extend below the BFE; and

e. Any building utility systems within the crawl space must be elevated above BFE or designed so that floodwaters cannot enter or accumulate within the system components during flood conditions.

f. Requirements for all below-grade crawl space construction, in addition to the above requirements, to include the following:

1. The interior grade of a crawl space below the BFE must not be more than two feet below the lowest adjacent exterior grade (LAG), shown as D in figure 3 of Technical Bulletin 11-01;

2. The height of the below-grade crawl space, measured from the interior grade of the crawl space to the top of the crawl space foundation wall must not exceed four feet (shown as L in figure 3 of Technical Bulletin 11-01) at any point;

3. There must be an adequate drainage system that removes floodwaters from the interior area of the crawl space within a reasonable period of time after a flood event, not to exceed seventy-two hours; and

4. The velocity of floodwaters at the site should not exceed five feet per second for any crawl space. For velocities in excess of five feet per second, other foundation types should be used.

5. Manufactured homes. See Section 15.06.054.

15.06.052 - Standards for utilities.

A. All new and replacement water supply and sanitary sewage systems shall be designed to minimize or eliminate:

1. Infiltration of floodwaters into the systems; and

2. Discharge from the systems into floodwaters.

B. On-site waste disposal systems shall be located to avoid impairment to them or contamination from them during flooding.

(Ord. No. 2955, 8-19-2008).

15.06.053 - Standards for subdivisions and other proposed development.

A. All new subdivision proposals and other proposed developments, including proposals for manufactured home parks, subdivisions, and the building of structures, in which either:

- The subdivision is greater than fifty lots; or
- The parcel is greater than five acres

shall:

1. Identify the flood hazard area (SFHA) and the base flood elevation (BFE).

2. Identify the elevations of lowest floors of all proposed structures and pads on the final plans.

3. If the site is filled above the base flood elevation, the following as-built information for each structure shall be certified by a registered civil engineer or licensed land surveyor and provided as part of an application for a Letter of Map Revision based on Fill (LOMR-F) to the floodplain administrator:

   a. Lowest floor elevation.

   b. Pad elevation.

   c. Lowest adjacent grade.

B. All subdivision proposals and other proposed development shall be consistent with the need to minimize flood damage.

C. All subdivision proposals and other proposed development shall have public utilities and facilities such as sewer, gas, electrical and water systems located and constructed to minimize flood damage.

D. All subdivisions and other proposed development shall provide adequate drainage to reduce exposure to flood hazards.

15.06.054 - Standards for manufactured homes.

A. All manufactured homes that are placed or substantially improved, on sites located: (1) outside of a manufactured home park or subdivision, (2) in a new manufactured home park or subdivision, (3) in an expansion to an existing manufactured home park or subdivision, or (4) in an existing manufactured home park or subdivision upon which a manufactured home has incurred "substantial damage" as the result of a flood, shall:

1. Within zones A1-30, AH, and AE on the community's Flood Insurance Rate Map, be elevated on a permanent foundation such that the lowest floor of the manufactured home is elevated two feet above the base flood elevation and be securely fastened to an adequately anchored foundation system to resist flotation, collapse, and lateral movement.

B. All manufactured homes to be placed or substantially improved on sites in an existing manufactured home park or subdivision within zones A1-30, AH or AE, on the community's Flood Insurance Rate Map that are not subject to the provisions of subsection 15.06.054A. will be securely fastened to an adequately anchored foundation system to resist flotation, collapse, and lateral movement, and be elevated so that either the;

1. Lowest floor of the manufactured home is at least two feet above the base flood elevation; or

2. Manufactured home chassis is supported by reinforced piers or other foundations elements of at least equivalent strength that are no less than thirty-six inches in height above grade.

Upon the completion of the structure, the elevation of the lowest floor including basement shall be certified by a registered civil engineer or licensed land surveyor, and verified by the community building inspector to be properly elevated. Such certification and verification shall be provided to the floodplain administrator.

15.06.055 - Standards for recreational vehicles.

A. All recreational vehicles placed in zones A1-30, AH, and AE will either:

1. Be on the site for fewer than one hundred eighty consecutive days; or

2. Be fully licensed and ready for highway use. A recreational vehicle is ready for highway use if it is on its wheels or jacking system, is attached to the site only by quick disconnect type utilities and security devices, and has no permanently attached additions; or

3. Meet the permit requirements of Section 15.06.043 of this chapter and the elevation and anchoring requirements for manufactured homes in subsection 15.06.054A.

15.06.056 - Floodways.

Since the floodway is an extremely hazardous area due to the velocity of flood waters which carry debris, potential projectiles and erosion potential, the following provisions apply:

A. Until a regulatory floodway is adopted, no new construction, substantial development, or other development (including fill) shall be permitted within zones A1-30 and AE, unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other development, will not increase the water surface elevation of the base flood more than one foot at any point within the County of Calaveras.

B. Within an adopted regulatory floodway encroachments, including fill, new construction, substantial improvement and other development are prohibited, unless certification by a registered civil engineer is provided demonstrating that the proposed encroachment shall not result in any increase in flood levels during the occurrence of the base flood discharge;

C. If subsections 15.06.056A. and B. of this chapter is satisfied, all new construction, substantial improvement and other proposed new development shall comply with all other applicable flood hazard reduction provisions of Section 15.06.051 through 15.06.056 of this chapter.

Title 16 Subdivision Ordinance

The regulations of this title shall apply to all subdivisions made entirely or partially within the unincorporated portions of the county. The planning director and county surveyor shall be responsible for an annual review of this title in relation to changes in the Subdivision Map Act and its effect on local regulation. The county surveyor shall ensure that such changes as necessary are presented for the approval of the board of supervisors within ninety days of the effective date of the changes in state law. This title regulates and controls subdivision of real property, including but not limited to:

- Subdivisions of land into four or fewer parcels;
- Subdivisions of five or more parcels;
- Reversions to acreage;
- Boundary line adjustment;
- Creation of five or more "time shares";
- Conversion of existing multiple-family residential structures or mobile home parks into condominium, planned unit development or stock cooperative ownership;
- Subdivision by gift deed;
- Subdivision by partition.

No tentative, parcel or final map shall be approved unless the proposed subdivision is in compliance with the General Plan or any applicable community, special or specific plan and the zoning ordinance.

Title 17 Zoning

The ordinances codified in this title are enacted for the following purposes:

- To provide a means of implementing the policies of the Calaveras County general plan;
- To provide a means to classify, and ensure adequate development of real property in the unincorporated portion of the county;
- To ensure that there are adequate services available to meet the needs of residences, business, commerce, recreation and industry;
- To establish fair, consistent development standards;
- To provide a means of prompt, fair, project consideration and review.

The following restrictions on construction and land use shall apply to the County:

- No building or structure shall be constructed, nor any land use commenced, enlarged or altered unless it is permitted in the zone in which the land is located.
- No building, structure or use of land shall commence, be altered, or enlarged unless it meets the requirements of the zone in which the land is located.
- A legally existing nonconforming use or structure may be expanded or enlarged upon approval of a conditional use permit pursuant to Chapter 17.82 and 17.90.

No land development shall take place, nor shall any permit be approved that does not comply with the goals, policies and general land uses of the general plan. In the event of conflict between the policies and standards of this title and the general plan, the general plan shall prevail. In the event a land use is established that is not in conformance with the general plan, the land use shall be required to conform with the provisions of the general plan in effect at the time of discovery.

Other Calaveras County NFIP Capabilities

In addition to the capabilities in the municipal code regarding floodplains, the County has additional capabilities. Table 4-63 shows the County's participation in and continued compliance with the NFIP, as well as identify areas for improvement that could be potential mitigation actions.

Table 4-63 Calaveras County NFIP Capabilities

NFIP Topic	Comments
Insurance Summary	
How many NFIP policies are in the community? What is the total premium and coverage?	332 NFIP policies in Calaveras County. Total premium is $226,596.00. Total coverage is $94,200,500.00
How many claims have been paid in the community? What is the total amount of paid claims? How many of the claims were for substantial damage?	To date, 28 claims have been paid in Calaveras County. Total amount of paid claims is $767,613.00. Five (5) of the claims were for substantial damage.
How many structures are exposed to flood risk within the community? *"flood risk" is defined as the 1% annual chance flood (100-year flood. Numbers are from overlay of FEMA SFHA and building stock data.	1,608 structures are located in FEMA Flood Zone A or AE in Calaveras County.
Describe any areas of flood risk with limited NFIP policy coverage	All areas of flood risk in the County have limited NFIP policy coverage. 1608 structures in Special Flood Hazard Areas (SFHAs), and only 326 NFIP policies countywide, thus 1,282 structures in SFHAs have no NFIP policy coverage.
Staff Resources	
Is the Community Floodplain Administrator or NFIP Coordinator certified?	No certification. Training is ongoing.
Provide an explanation of NFIP administration services (e.g., permit review, GIS, education or outreach, inspections, engineering capability)	Permit review, GIS, education, outreach, research, public assistance with insurance issues and LOMR processing.
What are the barriers to running an effective NFIP program in the community, if any?	Limited staffing, additional training needed. NFIP program is otherwise effective.
Compliance History	
Is the community in good standing with the NFIP?	Y

NFIP Topic	Comments
Are there any outstanding compliance issues (i.e., current violations)?	No violations but CAV "deliverables" are outstanding, including amendment to Flood Damage Prevention Ordinance and Standard Operating Procedures.
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)?	08/26/11
Is a CAV or CAC scheduled or needed?	Yes, a CAV is needed.
Regulation	
When did the community enter the NFIP?	09/05/1990
Are the FIRMs digital or paper?	Digital
Do floodplain development regulations meet or exceed FEMA or State minimum requirements? If so, in what ways?	N
Provide an explanation of the permitting process.	Standard Operating Procedures for the permitting process are being updated.
Community Rating System	
Does the community participate in CRS?	No
What is the community's CRS Class Ranking?	N/A
What categories and activities provide CRS points and how can the class be improved?	N/A
Does the plan include CRS planning requirements?	Yes

Source: Calaveras County, FEMA

4.4.2. Calaveras County's Administrative/Technical Mitigation Capabilities

Table 4-64 identifies the County personnel responsible for activities related to mitigation and loss prevention in the County.

Table 4-64 Calaveras County Administrative/Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	Y	Responsible for approval of discretionary project review including subdivisions and other projects. The Commission is responsible for applying conditions and mitigation measures to address public safety and hazard mitigation.
Mitigation Planning Committee	Y	Set up for the 2015 LHMP update.
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	Y	The County Public Works Department coordinates an annual channel vegetation clearance program for both Cosgrove Creek and San Andreas Creek to improve stream flows and reduce flooding during the winter months. The program is administered through the California Department of Fish and Game, U.S. Wildlife Service, and National Resource Conservation Service.
Mutual aid agreements		

Other		
Staff	**Y/N FT/PT**	**Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?**
Chief Building Official	Y FT	Building department staff are trained to enforce regulations. Working with the Planning Department, effective coordination occurs to enforce regulations in hazard prone areas.
Floodplain Administrator	Y FT	The Planning Director and a Planner III handle the duties of Floodplain administrator. Staffing is currently adequate to handle review of building permit applications to ensure conformance with the provisions of Chapter 15.06, Flood Damage Prevention. Planning staff coordinates with Building Dept. staff to ensure compliance.
Emergency Manager	Y FT	OES has an emergency manager who is part of Sherriff's Office staff.
Community Planner	Y FT	Planning department is adequately staffed and trained on hazards that may affect the County.
Civil Engineer	Y	
GIS Coordinator	Y	Planning department has GIS capabilities, as well as Technical Services, and are adequately staffed and trained on hazards that may affect the County.
Other		
Technical	**Y/N**	**Describe capability Has capability been used to assess/mitigate risk in the past?**
Warning systems/services (Reverse 911, outdoor warning signals)	Y	Reverse 911 system is administered by the Technical Services Division. It has been used to warn of hazard events in the past.
Hazard data and information	Y	DFIRMS and CAL FIRE GIS data
Grant writing	N	
Hazus analysis	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		

4.4.3. Calaveras County's Fiscal Mitigation Capabilities

Table 4-65 identifies financial tools or resources that the County could potentially use to help fund mitigation activities.

Table 4-65 Calaveras County Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Y	
Authority to levy taxes for specific purposes	N	
Fees for water, sewer, gas, or electric services	N	
Impact fees for new development	Y	
Storm water utility fee	Y	
Incur debt through general obligation bonds and/or special tax bonds	Y	
Incur debt through private activities	N	
Community Development Block Grant	Y	
Other federal funding programs	Y	
State funding programs	Y	
Other		
How can these capabilities be expanded and improved to reduce risk?		

4.4.4. Mitigation Outreach and Partnerships

Table 4-66 identifies education and outreach activities that the County uses to help fund mitigation activities.

Table 4-66 Calaveras County Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Y	The Calaveras County Fire Safety Council coordinates fuels reduction programs throughout the county including the upcountry areas of West Point and Arnold. These programs are designed to improve public awareness and reduce both fuel and fire risks.

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Y	In cooperation with Calaveras County Cal Fire administers an annual residential and vacant lot vegetation clearance program in the Arnold, CA area to reduce fuels and fire potential. The program is performed by the Cal Fire Volunteers in Prevention Program.
Natural disaster or safety related school programs	N	
StormReady certification	N	
Firewise Communities certification	N	
Public-private partnership initiatives addressing disaster-related issues	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		

4.4.5. Other Mitigation Efforts

Other mitigation efforts include an Emergency Alert System administered by California Office of Emergency Services (OES), and highway warning signs administered by the California Department of Transportation (Cal-Trans).

Chapter 5 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 describes the mitigation strategy process and mitigation action plan for the Calaveras County Local Hazard Mitigation Plan. It describes how the County and participating jurisdictions met the following requirements from the 10-step planning process:

- Planning Step 6: Set Goals
- Planning Step 7: Review Possible Activities
- Planning Step 8: Draft an Action Plan

5.1 Mitigation Strategy: Overview

The results of the planning process, the risk assessment, the goal setting, the identification of mitigation actions, and the work of the HMPC led to the mitigation strategy and mitigation action plan for this LHMP update. As part of the plan update process, a comprehensive review and update of the mitigation strategy portion of the 2010 plan was conducted by the HMPC. Some of the initial goals and objectives from the 2010 plan were refined and reaffirmed, some goals were deleted, and others were added. The end result was a new set of goals, reorganized to reflect the completion of any 2010 actions, the updated risk assessment and the new priorities of this plan update. To support the new LHMP goals, the mitigation actions from 2010 were reviewed and assessed for their value in reducing risk and vulnerability to the planning area from identified hazards and evaluated for their inclusion in this plan update (See Chapter 2 What's New). Section 5.2 below identifies the new goals and objectives of this plan update and Section 0 details the new mitigation action plan.

Taking all of the above into consideration, the HMPC developed the following umbrella mitigation strategy for this LHMP update:

- Communicate the hazard information collected and analyzed through this planning process as well as HMPC success stories so that the community better understands what can happen where and what they themselves can do to be better prepared.
- Implement the action plan recommendations of this plan.
- Use existing rules, regulations, policies, and procedures already in existence.
- Monitor multi-objective management opportunities so that funding opportunities may be shared and packaged and broader constituent support may be garnered.

5.1.1. Continued Compliance with NFIP

Given the flood hazard in the planning area, an emphasis will be placed on continued compliance with the National Flood Insurance Program (NFIP). Detailed below is a description of Calaveras County's flood management program to ensure continued compliance with the NFIP.

Calaveras County's Flood Management Program

Calaveras County has participated in the Regular Phase of the NFIP since September 5, 1990. Since then, the County has administered floodplain management regulations that meet the minimum requirements of the NFIP. Under that arrangement, residents and businesses paid the same flood insurance premium rates as most other communities in the country. The Community Rating System (CRS) was created in 1990. It is designed to recognize floodplain management activities that are above and beyond the NFIP's minimum requirements. Calaveras County is not currently a CRS participant. More information on the NFIP status of the County, as well as information about floodplain management can be found in Section 4.4.1. The resulting mitigation strategy included later in this section also includes several project that demonstrate the County's continued compliance with the NFIP.

5.2 Goals and Objectives

Requirement §201.6(c)(3)(i): [The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

Up to this point in the planning process, the HMPC has organized resources, assessed hazards and risks, and documented mitigation capabilities. The resulting goals, objectives, and mitigation actions were developed based on these tasks. The HMPC held a series of meetings and exercises designed to achieve a collaborative mitigation strategy as described further throughout this section.

During the initial goal-setting meeting, the HMPC reviewed the results of the hazard identification, vulnerability assessment, and capability assessment. This analysis of the risk assessment identified areas where improvements could be made and provided the framework for the HMPC to formulate planning goals and objectives and to develop the mitigation strategy for the Calaveras County Planning Area.

Goals were defined for the purpose of this mitigation plan as broad-based public policy statements that:

- Represent basic desires of the community;
- Encompass all aspects of community, 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
- A time-independent, in that they are not scheduled events.

Goals are stated without regard to implementation. Implementation cost, schedule, and means are not considered. Goals are defined before considering how to accomplish them so that they are not dependent on the means of achievement. Goal statements form the basis for objectives and actions that will be used as means to achieve the goals. Objectives define strategies to attain the goals and are more specific and measurable.

HMPC members were provided with the list of goals from the 2010 plan as well as a list of other sample goals to consider. They were told that they could use, combine, or revise the statements provided or develop new ones, keeping the risk assessment in mind. Each member was given three index cards and asked to write a goal statement on each. Goal statements were collected and grouped into similar themes and displayed on the wall of the meeting room. The goal statements were then grouped into similar topics. New goals from the HMPC were discussed until the team came to consensus. Some of the statements were determined to be better suited as objectives or actual mitigation actions and were set aside for later use.

Based on the risk assessment review and goal setting process, the HMPC identified the following goals and objectives, which provide the direction for reducing future hazard-related losses within the Calaveras County Planning Area. These goals and mitigation strategy of this Plan Update are desires based on the LHMP Update process. Nothing in this Plan Update should be construed as a mandate on the County or the City of Angels Camp.

Goal 1: Minimize risk and vulnerability of the community to the impacts of natural hazards and protect lives and reduce damages and losses to property, economy, and environment in Calaveras County.

- Minimize economic and resource impacts and promote long-term viability and sustainability of County resources
- Minimize impact to both existing and future development
- Provide protection for public health
- Prevent and reduce wildfire risk and related losses

Goal 2: Provide protection for critical facilities, infrastructure, utilities and services from hazard impacts.

Goal 3: Improve public awareness, education, and preparedness for hazards that threaten our communities.

- Enhance public outreach, education and preparedness program to include all hazards of concern
- Increase public knowledge about the risk and vulnerability to identified hazards and their recommended responses to disaster events, including evacuation and sheltering options
- Provide planning and coordination for "At-Risk" populations
- Provide planning and coordination for companion animals, livestock and other animal populations
- Increase community awareness and participation in hazard mitigation projects and activities

Goal 4: Increase communities' capabilities to be prepared for, respond to, and recover from a disaster event.

- Improve interagency (local, state, federal) emergency coordination, planning, training, and communication to ensure effective community preparedness, response and recovery
- Enhance collaboration and coordination of disaster-related plans, exercises, and training with local, state, and federal agencies, neighboring communities, private partners, and volunteers
- Enhance the use of shared resources/Develop a strong mutual aid support system
- Create and maintain a fully functional, interoperable radio and communication system with all regional public safety partners

- Define and practice emergency communication among the County Office of Emergency Services (OES) and community resources

Goal 5: Maintain FEMA Eligibility/Position the communities for grant funding.

5.3 Identification and Analysis of Mitigation Actions

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.

In order to identify and select mitigation actions to support the mitigation goals, each hazard identified in Section 4.1 was evaluated. Only those hazards that were determined to be a priority hazard were considered further in the development of hazard-specific mitigation actions.

These priority hazards (in alphabetical order) are:

- Agricultural Hazards
- Dam Failure
- Drought and Water Shortage
- Flood 100/500 year
- Flood: Localized Stormwater Flooding
- Severe Weather: Heavy Rains and Storms
- Severe Weather: Wind (includes tornadoes)
- Severe Weather: Winter Storms and Extreme Cold
- Wildfire

The HMPC eliminated the hazards identified below from further consideration in the development of mitigation actions because the risk of a hazard event in the County is unlikely or nonexistent, the vulnerability of the County is low, or capabilities are already in place to mitigate negative impacts. The eliminated hazards are:

- Avalanche
- Earthquake
- Landslides and Debris Flows
- Levee Failure
- Severe Weather: Extreme Heat
- Volcano

It is important to note, however, that all the hazards addressed in this plan are included in the countywide multi-hazard public awareness mitigation action as well as in other multi-hazard, emergency management actions.

Once it was determined which hazards warranted the development of specific mitigation actions, the HMPC analyzed viable mitigation options that supported the identified goals and objectives. The HMPC was provided with the following list of categories of mitigation actions, which originate from the Community Rating System:

- Prevention
- Property protection
- Structural projects
- Natural resource protection
- Emergency services
- Public information

The HMPC was also provided with examples of potential mitigation actions for each of the above categories. The HMPC was also instructed to consider both future and existing buildings and facilities in considering possible mitigation actions. A facilitated discussion then took place to examine and analyze the options. This was followed by a brainstorming session that generated a list of preferred mitigation actions by hazard. The initial list of mitigation actions is included in Appendix C – Mitigation Strategy.

5.3.1. Prioritization Process

Once the mitigation actions were identified, the HMPC was provided with several decision-making tools, including FEMA's recommended prioritization criteria, STAPLEE sustainable disaster recovery criteria; Smart Growth principles; and others, to assist in deciding why one recommended action might be more important, more effective, or more likely to be implemented than another. STAPLEE stands for the following:

- Social: Does the measure treat people fairly? (e.g., different groups, different generations)
- Technical: Is the action technically feasible? Does it solve the problem?
- Administrative: Are there adequate staffing, funding, and other capabilities to implement the project?
- Political: Who are the stakeholders? Will there be adequate political and public support for the project?
- Legal: Does the jurisdiction have the legal authority to implement the action? Is it legal?
- Economic: Is the action cost-beneficial? Is there funding available? Will the action contribute to the local economy?
- Environmental: Does the action comply with environmental regulations? Will there be negative environmental consequences from the action?

In accordance with the DMA requirements, an emphasis was placed on the importance of a benefit-cost analysis in determining action priority. Other criteria used to assist in evaluating the benefit-cost of a mitigation action includes:

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

The mitigation categories, multi-hazard actions, and criteria are included in Appendix C: Mitigation Strategy.

With these criteria in mind, HMPC members were each given a set of nine colored dots, three each of red, blue, and yellow. The dots were assigned red for high priority (worth five points), blue for medium priority (worth three points), and yellow for low priority (worth one point). The team was asked to use the dots to

prioritize actions with the above criteria in mind. The point score for each action was totaled. Appendix C contains the total score given to each identified mitigation action.

The process of identification and analysis of mitigation alternatives allowed the HMPC to come to consensus and to prioritize recommended mitigation actions. During the voting process, emphasis was placed on the importance of a benefit-cost review in determining project priority; however, this was not a quantitative analysis. After completing the prioritization exercise, some team members expressed concern that prioritizing all the actions as a group is not very effective, since many of the actions are jurisdiction- or department-specific. However, the team agreed that prioritizing the actions collectively enabled the actions to be ranked in order of relative importance and helped steer the development of additional actions that meet the more important objectives while eliminating some of the actions which did not garner much support.

Benefit-cost was also considered in greater detail in the development of the Mitigation Action Plan detailed below in Section 5.3. Specifically, each action developed for this plan contains a description of the problem and proposed project, the entity with primary responsibility for implementation, any other alternatives considered, a cost estimate, expected project benefits, potential funding sources, and a schedule for implementation. Development of these project details for each action led to the determination of a High, Medium, or Low priority for each.

Recognizing the limitations in prioritizing actions from multiple jurisdictions and departments and the regulatory requirement to prioritize by benefit-cost to ensure cost-effectiveness, the HMPC decided to pursue:

- mitigation action strategy development and implementation according to the nature and extent of damages;
- the level of protection and benefits each action provides;
- political support;
- project cost;
- available funding; and
- individual jurisdiction and department priority.

This process drove the development of a prioritized action plan for the Calaveras County Planning Area. Cost-effectiveness will be considered in greater detail when seeking FEMA mitigation grant funding for eligible actions associated with this plan.

5.4 Mitigation Action Plan

Requirement §201.6(c)(3)(iii): [The mitigation strategy section shall include] an action plan describing how the actions identified in section (c)(3)(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 benefit review of the proposed projects and their associated costs.

This action plan was developed to present the recommendations developed by the HMPC for how the Calaveras County Planning Area can reduce the risk and vulnerability of people, property, infrastructure, and natural and cultural resources to future disaster losses. Emphasis was placed on both future and existing development. The action plan summarizes who is responsible for implementing each of the prioritized actions as well as when and how the actions will be implemented. Each action summary also includes a discussion of the benefit-cost review conducted to meet the regulatory requirements of the Disaster Mitigation Act. Table 5-1 identifies the mitigation actions and lead jurisdiction for each action. Only those actions where the County is the lead jurisdiction are detailed further in this section. Actions specific to the City of Angels Camp is detailed in the jurisdictional annexes.

The action plan detailed below contains both new action items developed for this plan update as well as old actions that were yet to be completed from the 2010 plan or are ongoing actions. Table 5-1 indicates whether the action is new or from the 2010 plan and Chapter 2 contains the details for each 2010 mitigation action item indicating whether a given action item has been completed, deleted, or included in this update.

It is important to note that Calaveras County and the City of Angels Camp have numerous existing, detailed action descriptions, which include benefit-cost estimates, in other planning documents, such as community wildfire protection plans, stormwater plans and capital improvement budgets and reports. These actions are considered to be part of this plan, and the details, to avoid duplication, should be referenced in their original source document. The Calaveras County HMPC also realizes that new needs and priorities may arise as a result of a disaster or other circumstances and reserves the right to support new actions, as necessary, as long as they conform to the overall goals of this plan. **Specifically, as a result of the 2015 Butte Fire, which occurred during the writing of this plan, the HMPC will be developing additional and modified mitigation actions that are consistent with the overall goals and objectives of this plan update, but better reflect changing circumstances and priorities as a result of these devastating fires.**

Also, many of the action items included in this plan are a collaborative effort among participating jurisdictions and other local, state, and federal agencies and stakeholders in the Calaveras County planning area. Table 5-1 identifies the lead jurisdiction. The individual worksheets for each mitigation action item identify other mitigation partners. In addition, many of the more regional actions, where the county is identified as the lead, such as the Multi-Hazard Seasonal Public Awareness Program, will provide a mitigation benefit to all participating jurisdictions and communities in the planning area.

Table 5-1 Calaveras County Planning Area's Mitigation Actions

Action	Project Lead/Participating Agencies	New Action/ 2010 Action	Addresses Current Development	Addresses Future Development	Continued Compliance w/NFIP
Calaveras County					
Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	Calaveras County Planning Department	2010 Action	X	X	
Develop and Conduct a Multi-Hazard Seasonal Public Awareness Program	Calaveras County Sherriff's Office	2010 Action	X	X	X
Identify Critical Facilities/Infrastructure Needing Backup Power Sources	Calaveras County Public Works Department	2010 Action	X	X	X
Improve Channel Maintenance and Upkeep to Prevent Debris Build-up at Road Bridges	Calaveras County Public Works Department	2010 Action	X	X	X
Implement Fuel Reduction along County Right of Ways	Calaveras County Public Works Department	2010 Action	X	X	
Identify Storm Water Flooding Projects	Calaveras County Public Works Department	2010 Action	X	X	X
Retrofit At-Risk Structures with Ignition-Resistant Materials	Calaveras Fire Safe Council, CAL FIRE, local fire districts	New Action	X	X	
Create Defensible Space Around Structures and Infrastructure	Calaveras Fire Safe Council, CAL FIRE, local fire districts	New Action	X	X	
Conduct Maintenance to Reduce Risk	Calaveras Fire Safe Council, CAL FIRE, local fire districts	New Action	X	X	
Implement a Fuels Management Program	Calaveras Fire Safe Council, CAL FIRE, local fire districts	New Action	X	X	
Participate in Firewise Program	Calaveras Fire Safe Council, CAL FIRE, local fire districts	New Action	X	X	
Increase Wildfire Risk Awareness	Calaveras Fire Safe Council, CAL FIRE, local fire districts	New Action	X	X	
Educate Property Owners about Wildfire Mitigation Techniques	Calaveras Fire Safe Council, CAL FIRE, local fire districts	New Action	X	X	
Schaads Reservoir Siltation Removal	Calaveras Public Utility District	New Action	X	X	X

Action	Project Lead/Participating Agencies	New Action/ 2010 Action	Addresses Current Development	Addresses Future Development	Continued Compliance w/NFIP
Schaads Reservoir Conveyance Systems	Calaveras Public Utility District	New Action	X	X	X
Distribution System Up-Grades for Fire Flow	Calaveras Public Utility District	New Action	X	X	
GIS Mapping of Distribution System & FH Locations	Calaveras Public Utility District	New Action	X	X	
Rail Road Flat to Mountain Ranch System Extension	Calaveras Public Utility District	New Action	X	X	
Leonard Road System Extension	Calaveras Public Utility District	New Action	X	X	
East San Andreas Extension	Calaveras Public Utility District	New Action	X	X	
Temporary Animal Shelter	Calaveras County Animal Services	New Action	X		
Preparedness Education of the Public	Calaveras County Animal Services	New Action	X		
Communication System Enhancements	Calaveras County Sheriff's Office in conjunction with the City of Angels Police Department and Cal Fire	New Action	X	X	
FMAG Hazard Mitigation – Calaveras County Burn Area	Calaveras County	New Action	X	X	X
Mokelumne Watershed Protection Project	Calaveras County	New Action	X	X	X
Pardee Reservoir Protection	Calaveras County	New Action	X	X	
New Hogan Reservoir Protection	Calaveras County	New Action	X	X	
Whiskey Slide Road at Wet Gulch Culvert Replacement Project	Calaveras County	New Action	X	X	X
Cosgrove Creek Flood Mitigation	Calaveras County	New Action	X	X	X
City of Angels					
Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	City of Angels Camp	2010 Action	X	X	
Develop and Conduct a Multi-Hazard Seasonal Public Awareness Program	City of Angels Camp	New Action	X	X	X
Retrofit At-Risk Structures with Ignition-Resistant Materials	City of Angels Camp	New Action	X	X	

Action	Project Lead/Participating Agencies	New Action/ 2010 Action	Addresses Current Development	Addresses Future Development	Continued Compliance w/NFIP
Create Defensible Space Around Structures and Infrastructure	City of Angels Camp	New Action	X	X	
Conduct Maintenance to Reduce Risk	City of Angels Camp	New Action	X	X	
Implement a Fuels Management Program	City of Angels Camp	New Action	X	X	
Participate in Firewise Program	City of Angels Camp	New Action	X	X	
Increase Wildfire Risk Awareness	City of Angels Camp	New Action	X	X	
Educate Property Owners about Wildfire Mitigation Techniques	City of Angels Camp	New Action	X	X	
Reclaimed Water Line	City of Angels Camp	New Action	X	X	
Water Storage Tank	City of Angels Camp	New Action	X	X	
Sewer Line to Fairgrounds	City of Angels Camp	New Action	X	X	
Storm Drain Master Plan	City of Angels Camp	New Action	X	X	X
Emergency Power to Command Center and Cooling/Warming Centers	City of Angels Camp	New Action	X	X	
Water Line to Whittle Road	City of Angels Camp	New Action	X	X	

Mitigation Actions

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

Hazards Addressed: All

Issue/Background: Local jurisdiction reimbursement for mitigation projects and cost recovery after a disaster is guided by Government Code Section 8685.9. Specifically, this section requires that the County must 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 adopted pursuant to subdivision (g) of Section 65302. It is important for Calaveras County to incorporate the County's LHMP Update into the safety element as part of the next general plan update.

Other Alternatives: No feasible alternatives

Existing Planning Mechanisms through which Action will be Implemented: Safety Element of General Plan

Responsible Office: Calaveras County Planning Department

Priority (High, Medium, Low): High

Cost Estimate: To be determined

Benefits (avoided Losses): Planning documents will help the County and each city maximize potential for state reimbursement

Potential Funding: State and/or Federal Grant, existing budgets

Timeline: As soon as possible

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

Hazards Addressed: Multi-Hazard

Issue/Background: Calaveras County is subject to several natural hazards, each which pose 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 can reduce the impact, such that the HMPC has recommended specific actions be taken. For other hazards, where either the likelihood of occurrence is very low, or the area of likely impact is not specifically known, or there is very little that can be done to reduce the impacts, that the HMPC has determined that the best approach would simply be public awareness. People should know what the HMPC knows: 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 State Office of Emergency Services, and the American Red Cross.

Other Alternatives: Continue public information activities currently implemented

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Office: Calaveras County Sherriff's Office

Priority (H, M, L): Medium

Cost Estimate: To be determined depending upon printing and mailing costs, level of volunteer participation, and scope and frequency of events.

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

Potential Funding: HMPG, PDM

Timeline: Ongoing - Part of seasonal multi-hazard public awareness campaign

Action 3. Identify Critical Facilities/Infrastructure Needing Backup Power Sources

Hazards Addressed: Multi-hazard

Issue/Background: Critical facilities provide public health and safety services for public and private physical assets throughout the planning area. As such, it is critical that their power sources remain uninterrupted, especially during critical response and recovery operations.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Office: Calaveras County Public Works Department; in conjunction with PG&E, Caltel, and CCWD.

Priority (H, M, L): Medium

Cost Estimate: Staff time, $10,000-$15,000.

Benefits (Losses Avoided):

- Protection of life and property
- Reliable communications

Potential Funding: Local funding mechanisms

Timeline: Within 5 years.

Action 4. Improve Channel Maintenance and Upkeep to Prevent Debris Build-up at Road Bridges

Hazards Addressed: Flooding

Issue/Background: 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.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: 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 Office: Calaveras County Public Works Department; in conjunction with USFWS, USACE, CWRB, CFG

Priority (H, M, L): High

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
- Preserve community ingress and egress

Potential Funding: Prop 1-B, Prop 42

Timeline: Each year prior to winter and spring rains

Action 5. Implement Fuel Reduction along County Right of Ways

Hazards Addressed: Wildfire

Issue/Background: 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 the County. 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.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: CWPP.

Responsible Office: Calaveras County Public Works Department

Priority (H, M, L): Medium

Cost Estimate: Preservation of life and property

Benefits (Losses Avoided): Proposed work to be completed by CDF crews with minimum forced labor at an estimated cost of $20,000

Potential Funding: Prop 42

Timeline: Within 5 years.

Action 6. Identify Storm Water Flooding Projects

Hazards Addressed: Localized Flooding

Issue/Background: 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.

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 stormwater management plan which endeavors to contain work site runoff from entering local waterways.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Office: Calaveras County Public Works Department; in conjunction with USACE, CCWD, RWCB

Priority (H, M, L): Medium

Cost Estimate: Staff time for identification of projects; $15,000-$20,000.

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

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

Timeline: Within 5 years.

Action 7. Retrofit At-Risk Structures with Ignition-Resistant Materials

Hazards Addressed: Wildfire

Issue/Background: Existing structures in wildfire hazard areas inside Calaveras County can be protected through the use of non-combustible materials and technologies, including:

- Installing roof coverings, sheathing, flashing, skylights, roof and attic vents, eaves, and gutters that conform to ignition-resistant construction standards.
- Installing wall components that conform to ignition-resistant construction standards.
- Protecting propane tanks or other external fuel sources.
- Purchasing and installing external, structure-specific water hydration systems (sprinklers); dedicated power sources; and dedicated cisterns if no water source (e.g., lake, river, or swimming pool) is available.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: CWPP

Responsible Office: Calaveras Fire Safe Council, CAL FIRE, local fire districts, City of Angels Camp Fire Department

Priority (H, M, L): High

Cost Estimate: To be determined on a case by case basis.

Benefits (Losses Avoided): Reduced risk of wildfire to individual properties at risk to wildfire due to their construction. In addition, the adjacent properties to those structures not built to fire code (or built before code enforcement) would see reduced risk as well.

Potential Funding: PDM, HMGP

Timeline: As soon as funding is available.

Action 8. Create Defensible Space Around Structures and Infrastructure

Hazards Addressed: Wildfire

Issue/Background: Calaveras County can implement defensible space programs to reduce risk to structures and infrastructure, including:

- Creating buffers around residential and non-residential structures through the removal or reduction of flammable vegetation, including vertical clearance of tree branches.
- Replacing flammable vegetation with less flammable species.

- Creating defensible zones around power lines, oil and gas lines, and other infrastructure systems.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: CWPP

Responsible Office: Calaveras Fire Safe Council, CAL FIRE, local fire districts, City of Angels Camp Fire Department

Priority (H, M, L): High

Cost Estimate: To be determined on a case by case basis.

Benefits (Losses Avoided): Reduced risk of wildfire damage to properties in Calaveras County. Reduced risk of injury and fatality to firefighters.

Potential Funding: PDM, HMGP

Timeline: As soon as funding is available.

Action 9. Conduct Maintenance to Reduce Risk

Hazards Addressed: Wildfire

Issue/Background: Calaveras County can implement maintenance procedures to reduce wildfire risk, including:

- Performing arson prevention cleanup activities in areas of abandoned or collapsed structures, accumulated trash or debris, and with a history of storing flammable materials where spills or dumping may have occurred.
- Preventing or alleviating wildfires by proper maintenance and separation of power lines as well as efficient response to fallen power lines.
- Routinely inspecting the functionality of fire hydrants.
- Requiring and maintaining safe access for fire apparatus to wildland-urban interface neighborhoods and properties.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: CWPP

Responsible Office: Calaveras Fire Safe Council, CAL FIRE, local fire districts, City of Angels Camp Fire Department

Priority (H, M, L): High

Cost Estimate: To be determined on a case by case basis.

Benefits (Losses Avoided): Reduced risk of wildfire damage to properties in Calaveras County. Reduced risk of injury and fatality to firefighters.

Potential Funding: PDM, HMGP

Timeline: As soon as funding is available.

Action 10. Implement a Fuels Management Program

Hazards Addressed: Wildfire

Issue/Background: Calaveras County desires a fuels management program to be implemented to reduce hazardous vegetative fuels on public lands, near essential infrastructure, or on private lands by working with landowners. The program may include the following:

- Performing maintenance including fuel management techniques such as pruning and clearing dead vegetation, selective logging, cutting high grass, planting fire-resistant vegetation, and creating fuel/fire breaks (i.e., areas where the spread of wildfires will be slowed or stopped by the removal of fuels).
- Using prescribed burning to reduce fuel loads that threaten public safety and property.
- Identifying and clearing fuel loads created by downed trees.
- Cutting firebreaks into public wooded areas in the wildland-urban interface.
- Sponsoring local "slash and clean-up days" to reduce fuel loads along the wildland-urban interface.
- Linking wildfire safety with environmental protection strategies (i.e., improving forest ecology, wildlife habitat, etc.).
- Developing a vegetation management plan.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: CWPP

Responsible Office: Calaveras Fire Safe Council, CAL FIRE, local fire districts, City of Angels Camp Fire Department

Priority (H, M, L): High

Cost Estimate: To be determined.

Benefits (Losses Avoided): Reduced risk of damage to property. Increased life safety for homeowners and firefighters.

Potential Funding: PDM, HMGP

Timeline: As soon as funding is available.

Action 11. Participate in Firewise Program

Hazards Addressed: Wildfire

Issue/Background: The Firewise program provides a series of steps that individual residents and their neighbors can take to keep their homes and neighborhoods safer from fire. Various parts of Calaveras County participate in the Firewise program. The following areas are also considering participation:

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Office: Calaveras Fire Safe Council, CAL FIRE, local fire districts, City of Angels Camp Fire Department

Priority (H, M, L): High

Cost Estimate: To be determined.

Benefits (Losses Avoided): Reduced risk to wildfire due to individual property owners taking steps to protect their own properties.

Potential Funding: PDM, HMGP

Timeline: As soon as funding is available.

Action 12. Increase Wildfire Risk Awareness

Hazards Addressed: Wildfire

Issue/Background: Education and outreach programs can target citizens, businesses, developers, landscapers, and insurers among others to increase awareness of wildfire risk and strategies for protecting homes and infrastructure. Calaveras County has considered:

- Offering GIS hazard mapping online for residents, developers, and design professionals.
- Organizing a local fire department tour to show local elected officials and planners the most vulnerable areas of the community's wildland-urban interface and increase their understanding of risks.
- Working with insurance companies, utility providers, and others to include wildfire safety information in materials provided to area residents.
- Developing partnerships with neighborhood groups, homeowners' associations, and others to conduct outreach activities.
- Using local fire departments to conduct education programs in schools.
- Informing the public about proper evacuation procedures.
- Forming a citizen plan implementation steering committee to monitor progress of local mitigation actions. Include a mix of representatives from neighborhoods, local businesses, and local government.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Office: Calaveras Fire Safe Council, CAL FIRE, local fire districts, City of Angels Camp Fire Department

Priority (H, M, L): High

Cost Estimate: Staff time.

Benefits (Losses Avoided): Reduced wildfire risk due to increased homeowner knowledge and understanding of their individual wildfire risk.

Potential Funding: PDM, HMGP

Timeline: Ongoing

Action 13. Educate Property Owners about Wildfire Mitigation Techniques

Hazards Addressed: Wildfire

Issue/Background: Calaveras County can reduce risk to wildfire by educating property owners on actions that they can take to reduce risk to property, such as the following:

- Installing fire mitigation systems such as interior and exterior sprinkler systems.
- Performing safe disposal of yard and household waste rather than open burning.
- Removing dead or dry leaves, needles, twigs, and combustibles from roofs, decks, eaves, porches, and yards.
- Creating a defensible space or buffer zone cleared of combustible materials around property.
- Installing and maintaining smoke detectors and fire extinguishers on each floor of their homes or other buildings.
- Safely using and storing necessary flammable materials, including machine fuels. Approved safety cans should be used for storing gasoline, oily rags, and other flammable materials. Firewood should be stacked at least 100 feet away and uphill from homes.
- Keeping flammables, such as curtains, secured away from windows or using heavy fire-resistant drapes.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Office: Calaveras Fire Safe Council, CAL FIRE, local fire districts, City of Angels Camp Fire Department

Priority (H, M, L): High

Cost Estimate: Staff time. Advertising and printing costs.

Benefits (Losses Avoided): Reduced wildfire risk due to increased homeowner knowledge and understanding of their individual wildfire risk.

Potential Funding: PDM, HMGP

Timeline: Ongoing

Action 14. Schaads Reservoir Siltation Removal

Hazards Addressed: Drought & Water Supply

Issue/Background: The Calaveras Public Utilities District (CPUD) has water rights to Schaads Reservoir. This reservoir is an untreated water storage body and is used for recreation, a domestic water source and Hydro Electric Generation (Hdyro). The tail-water from the Hydro discharges into the Licking Fork of the Mokelumne River (a reach of the South Fork of Mokelumne) from which CPUD diverts and pumps raw water to Jeff Davis Reservoir.

Other Alternatives: No Action

Existing Planning Mechanism(s) through which Action Will Be Implemented: C.I.P.

Responsible Office/Partners: CPUD

Project Priority: Medium

Cost Estimate: $500,000 (2012)

Benefits (Losses Avoided): Silt and other debris continually accumulates into the tributaries to the reservoir where it is deposited. As silt and debris levels increase over the years, it impacts the storage capacity and water quality in the reservoir. Periodic de-silting and debris removal will improve water quality and operational value of the reservoirs.

Potential Funding: To be determined

Timeline: Ongoing

Action 15. Schaads Reservoir Conveyance Systems

Hazards Addressed: Drought & Water Supply / Wild Fire

Issue/Background: Currently CPUD diverts raw water from the Licking Fork of the Mokelumne River via pumps to a holding reservoir (Jeff Davis). This pumping diversion is the only source of conveying water to the Jeff Davis Reservoir which feeds the entire district.

Other Alternatives:

A. Construct a gravity line from Schaads Reservoir directly to the South Fork Pump Station.

B. Construct a pipeline directly from Schaads Reservoir to Jeff Davis Reservoir, eliminating the need to pump water from the South Fork. South Fork Pump Station could be used as a backup supply in the event of an emergency.

Existing Planning Mechanism(s) through which Action Will Be Implemented: C.I.P.

Responsible Office/Partners: CPUD

Project Priority: High

Cost Estimate: $10,800,000

Benefits (Losses Avoided): Loss of diversion from the South Fork Pump Station to Jeff Davis Reservoir would require CPUD to operate solely on the storage of Jeff Davis Reservoir. The reservoir has holding capacity of approximately 12 to 14 month should diversion of water be completely interrupted.

Potential Funding: To be Determined

Timeline: Ongoing

Action 16. Distribution System Up-Grades for Fire Flow

Hazards Addressed: Wildfire/Drought & Water Supply

Issue/Background: Various Pipelines throughout the CPUD service area showing signs of stress due to the aging of infrastructure, are undersized for fire flow, and have low pressure for fire flow. CPUD has annual pipe replacement budget in the C.I.P., however, due to limited funds, there is not sufficient funding to prioritize all the need improvements. Priorities are being evaluated for the most needed repairs and/or replacements.

Other Alternatives: No Action

Existing Planning Mechanism(s) through which Action Will Be Implemented: C.I.P.

Responsible Office/Partners: CPUD

Project Priority: High

Cost Estimate: $17,500,000 (2012)

Benefits (Losses Avoided): Replacements and upgrades will enhance the reliability of water delivery, fire flows and pressures. In some locations pipe ruptures could cause reduction in customer delivery and fire protection. Additionally, pipe ruptures could cause localized flooding, and damage and/or loss to property.

Potential Funding: C.I.P., Alternative Funding Sources

Timeline: Ongoing

Action 17. GIS Mapping of Distribution System & FH Locations

Hazards Addressed: Wildfire /Drought & Water Supply

Issue/Background: Mapping of CPUD system is well over 20 years old and are in need of updating. Location of water valve, fire hydrants and various other appurtenances need GPS Coordinates to assist CPUD staff and coordinating agencies for quick and accurate locating in emergency conditions.

Other Alternatives: No Action

Existing Planning Mechanism(s) through which Action Will Be Implemented: C.I.P.

Responsible Office/Partners: CPUD

Project Priority: Medium

Cost Estimate: $500,000 (2012)

Benefits (Losses Avoided): Reliable mapping and locating techniques can provide CPUD with accurate locations valves for pipe breakage shutdowns or hydrant locations for fire department response.

Potential Funding: C.I.P., Alternative Funding Sources

Timeline: Ongoing

Action 18. Rail Road Flat to Mountain Ranch System Extension

Hazards Addressed: Wildfire /Drought & Water Supply

Issue/Background: Private Residents within the areas between Rail Road Flat to Mountain Ranch are currently on private wells. These wells over the years have in some cases become inadequate in supply and quality.

Other Alternatives: No Action

Existing Planning Mechanism(s) through which Action Will Be Implemented: C.I.P.

Responsible Office/Partners: CPUD

Project Priority: Medium

Cost Estimate: $10,000,000 (2012)

Benefits (Losses Avoided): Current Residents will have inadequate water supply which may have quality issues for domestic consumption if no action is taken. Installation of a water delivery system will provide sufficient supply water to drinking water standards. In addition, fire hydrant would be installed at appropriate intervals for fire protection.

Potential Funding: C.I.P., Alternative Funding Sources

Timeline: Ongoing

Action 19. Leonard Road System Extension

Hazards Addressed: Wildfire /Drought & Water Supply

Issue/Background: Private Residents within the areas along Leonard Road have requested public water and fire protection.

Other Alternatives: No Action

Existing Planning Mechanism(s) through which Action Will Be Implemented: C.I.P.

Responsible Office/Partners: CPUD

Project Priority: Low

Cost Estimate: $1,200,000 (2012)

Benefits (Losses Avoided): Current Residents are currently on private well systems with no water source for fire protection. Installation of a water delivery system will provide sufficient supply water to drinking water standards. In addition, fire hydrant would be installed at the appropriate intervals for fire protection.

Potential Funding: C.I.P., Alternative Funding Sources

Timeline: Ongoing

Action 20. East San Andreas Extension

Hazards Addressed: Wildfire /Drought & Water Supply

Issue/Background: Private Residents within the East San Andreas area have requested public water and fire protection.

Other Alternatives: No Action

Existing Planning Mechanism(s) through which Action Will Be Implemented: C.I.P.

Responsible Office/Partners: CPUD

Project Priority: Low

Cost Estimate: $1,500,000 (2012)

Benefits (Losses Avoided): Current Residents are currently on private well systems with no water source for fire protection. Installation of a water delivery system will provide sufficient supply water to drinking water standards. In addition, fire hydrant would be installed at the appropriate intervals for fire protection.

Potential Funding: C.I.P., Alternative Funding Sources

Timeline: Ongoing

Action 21. Temporary Animal Shelter

Hazards Addressed: All hazards that can lead to evacuations

Issue/Background: Ever since Katrina it became obvious that many people do not respond to evacuation orders if they can't do so with their companion animal. The sheltering during evacuation is currently limited to humans and service dogs. American Red Cross shelters do not allow any companion animal in. As a result people were refusing to use the services during the Rim Fire in Tuolumne and rather camped out in unsafe locations with no service.

Animal Services has started a volunteer group that is dedicated to open a temporary animal shelter next to an ARC shelter that will take in shelter resident's pets.

For a rapid response all items necessary to open and operate a small animal shelter need to be available. Increase of shelter size during an expanding incident can be facilitated with donations from pet stores and other outlets.

Other Alternatives: An alternative would be to temporarily increase the capacity of the main shelter. This would still not allow evacuees to use an ARC shelter and have their pet close by.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Calaveras Animal Disaster Shelter team (CADS) is operating under the lead of Animal Services and developed over the last year the procedures and documents necessary to open, operate and close a temporary animal shelter. Temporary Animal Shelters are part of the overall emergency preparedness plan Animal Services is currently developing.

Responsible Office/Partners: Animal Services/CADS

Project Priority: Medium

Cost Estimate: Approx. $6,200

Benefits (Losses Avoided): Being prepared to provide this service during a disaster will allow for more controlled and earlier evacuation and the appropriate care of pets. It will also guide people away from the old-time recommendation "cut the fence and let them run".

It will also reduce the risk for responders posed by animals at large and/or last minute evacuations.

Potential Funding: Grant funding and local donations

Timeline: Basic outfit by May 2016

Action 22. Preparedness Education of the Public

Hazards Addressed: All hazards that can lead to evacuations or shelter in place

Issue/Background: Preparedness for emergencies through education and a few items to get people through the first three days is the cheapest and most effective mitigation of hazards. Unfortunately it is also one that is mostly forgotten until it is too late. This is especially true when it comes to domestic animals. As such public outreach, continuous education, and leading by example is needed.

Other Alternatives: None.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Calaveras Animal Disaster Shelter team (CADS) is operating under the lead of Animal Services and is developing a public outreach program to educate the public about the importance of preparedness and what is needed to either safely evacuate or shelter in place.

Responsible Office/Partners: Animal Services/CADS

Project Priority: Medium

Cost Estimate: Approx. $2,500

Benefits (Losses Avoided): Often the loss of companion animals or livestock is preventable it the appropriate steps were taken to prepare for an emergency.

Potential Funding: Grant funding and local donations

Timeline: Basic public outreach is currently under way. The bulk of material is needed by January 2016 to support the spring drive. After that it will be a reoccurring program prior to the start of the fire season.

Action 19. Communication System Enhancements

Hazards Addressed: All hazards

Issue/Background: The County needs to implement improvements to their Communication systems to ensure uninterrupted communications before, during and after a disaster event. There are several areas where system improvements can be made. For example, law enforcement and Fire currently run on different frequencies. Communications infrastructure with redundancy also needs to be build up. New radio towers are needed to house repeaters. During the recent Butte fire, one repeater was almost lost.

Other Alternatives: Continue Status Quo

Existing Planning Mechanism(s) through which Action Will Be Implemented: EOP

Responsible Office/Partners: Calaveras County Sheriff's Office, City of Angels Police Department, Cal Fire

Project Priority: High

Cost Estimate:

Benefits (Losses Avoided): Keeping communications up and running during disaster events is critical to the projection of lives and to limit property damage.

Potential Funding: Homeland Security Grants

Timeline: 1-3 years

Action 23. FMAG Hazard Mitigation – Calaveras Burn Area

Hazards Addressed: Flooding/Soil Erosion/Landslide/Water Quality

Issue/Background: The Butte Fire has created the following issues:

- Potential flooding
- Potential large scale erosion

Other Alternatives: Deploy erosion and sediment control with seeding and reforestation. Most of this work will take place on private lands.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Butte Fire Response: PFEWRT Report – 10/12/2015; BLM Post Fire Report; UMWRA

Responsible Office: Calaveras County Public Works

Priority (H, M, L): High

Cost Estimate: Severe burn – $4,500/acre; moderate burn – $2,500/acre; low burn – $600/acre

Benefits (Losses Avoided): Erosion and sediment control will slow the runoff water down and allow the water a longer time to infiltrate the soil. By slowing down the water this will minimize the amount of flooding that could occur. Erosion and sediment control will reduce the runoff velocity, which will minimize the large scale erosion.

Potential Funding: Fire Management Assistance Grant Program (FMAG), $588,000 of which local match is $147,000.

Timeline: Immediately, before significant precipitation falls.

Action 24. Mokelumne Watershed Protection Project

Hazards Addressed: Flooding/Drought and Water Shortage/Landslide/Water Quality

Issue/Background: The Butte Fire has created the following issues:

- Hydrophobic soil which minimizes the amount of precipitation that can infiltrate the soil.
- Increased runoff due to hydrophobic soil
- Contaminants in the drinking water supply
- Reforestation density

Other Alternatives: Deploy erosion and sediment controls with seeding and reforestation. This work would need to be performed in conjunction with the Bureau of Land Management and private land owners in an 18,455 acre area. Another alternative is to do nothing and provide for expanded water treatment at the reservoir.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Butte Fire Response: PFEWRT Report – 10/12/2015; BLM Post Fire Report; UMWRA

Responsible Office: Calaveras County Public Works

Priority (H, M, L): High

Cost Estimate: Severe burn – $4,500/acre; moderate burn – $2,500/acre; low burn – $600/acre

Benefits (Losses Avoided): Erosion and sediment control will slow the runoff down and allow the water a longer time to infiltrate into the soil. Erosion and sediment control will minimize the amount of runoff by infiltration and provide a lesser probability of flooding. By using erosion and sediment control the runoff will be slowed down enough that the contaminants will be able to settle out and not contaminate the drinking water supply. By providing an appropriate reforestation density the natural ecosystem can be restored and provide additional ways for the precipitation to infiltrate.

Potential Funding: EBMUD, local water agencies, disaster funding (Cal OES/FEMA), UMWRA

Timeline: Immediately, before significant precipitation falls.

Action 25. Pardee Reservoir Protection

Hazards Addressed: Water Shortage/Landslide/Water Quality

Issue/Background: The Butte Fire has created the problem of contaminants in the drinking water supply.

Other Alternatives: To design and deploy a system that will be able to remove containments in a large Scale; or land restoration.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Butte Fire Response: PFEWRT Report – 10/12/2015; BLM Post Fire Report; UMWRA

Responsible Office: Calaveras County Public Works

Priority (H, M, L): High

Cost Estimate: Severe burn – $4,500/acre; moderate burn – $2,500/acre; low burn – $600/acre

Benefits (Losses Avoided): By minimizing the amount of contaminan1s in the drinking water reservoir this will minimize the potential impacts to the drinking water treatment system downstream.

Potential Funding: EBMUD, local water agencies, disaster funding (Cal OES/FEMA), UMWRA

Timeline: Immediately, before significant precipitation falls.

Action 26. New Hogan Reservoir Protection

Hazards Addressed: Water Shortage/Landslide/Water Quality

Issue/Background: The Butte Fire has created the problem of contaminants in the drinking water supply.

Other Alternatives: To design and deploy a system that will be able to remove containments in a large Scale; or land restoration.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Butte Fire Response: PFEWRT Report – 10/12/2015; BLM Post Fire Report; UMWRA

Responsible Office: Calaveras County Public Works

Priority (H, M, L): High

Cost Estimate: Severe burn – $4,500/acre; moderate burn – $2,500/acre; low burn – $600/acre

Benefits (Losses Avoided): y minimizing the amount of contaminan1s in the drinking water reservoir this will minimize the potential impacts to the drinking water treatment system downstream.

Potential Funding: EBMUD, local water agencies, disaster funding (Cal OES/FEMA), UMWRA

Timeline: Immediately, before significant precipitation falls.

Action 27. Whiskey Slide Road at Wet Gulch Culvert Replacement Project

Hazards Addressed: Flooding/Debris Flows/Landslide/Water Quality

Issue/Background: The Butte Fire has created the following issues:

- Potential Flooding
- Potential Increase in Debris Flow

Other Alternatives: Upsizing of culverts.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Butte Fire Response: PFEWRT Report – 10/12/2015; BLM Post Fire Report; UMWRA

Responsible Office: Calaveras County Public Works

Priority (H, M, L): Moderate

Cost Estimate: $250,000

Benefits (Losses Avoided): Upsizing the culvert will minimize the flooding potential by creating additional capacity. With an upsized culvert the potential for debris to clog the culvert and flood the surrounding area is significantly reduced.

Potential Funding: Disaster funding (Cal OES/FEMA)

Timeline: Immediately, before significant precipitation falls.

Action 28. Cosgrove Creek Flood Mitigation Project

Hazards Addressed: Flooding

Issue/Background: Implementation of flood mitigation measures to reduce damage to public and private properties and improve stream flows and flood drainage.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Office: Calaveras County Public Works

Priority (H, M, L): Moderate

Cost Estimate: To be determined.

Benefits (Losses Avoided): Reduced risk of flooding to residents.

Potential Funding: To be determined.

Timeline: As soon as funding is available.

Chapter 6 Plan Adoption

Requirement §201.6(c)(5): [The local hazard mitigation plan shall include] documentation that the plan has been formally approved by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, county commissioner, Tribal Council).

The purpose of formally adopting this plan is to secure buy-in from Calaveras County and participating jurisdictions, raise awareness of the plan, and formalize the plan's implementation. The adoption of this plan completes Planning Step 9 of the 10-step planning process: Adopt the Plan, in accordance with the requirements of DMA 2000. This adoption also establishes compliance with AB 2140 requiring adoption by reference or incorporation into the safety element of the general plan. The governing board for each participating jurisdiction has adopted this Local Hazard Mitigation Plan by passing a resolution. A copy of the generic resolution and the executed copies (pending) are included in Appendix D: Adoption Resolutions.

Chapter 7 Plan Implementation and Maintenances

Requirement §201.6(c)(4): [The plan maintenance process shall include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

Implementation and maintenance of the plan is paramount to the overall success of hazard mitigation planning. Through this hazard mitigation planning process, Calaveras County and the City of Angel's Camp have identified and prioritized mitigation policies and actions to reduce community risk and vulnerability as part of their updated mitigation strategy. Implementation of a proactive mitigation strategy helps create a safer more disaster resistant community though:

- Protecting public safety,
- Preventing damage to infrastructure, residences, and other development,
- Encouraging safer and more sustainable development, and
- Reducing the costs of disaster response and recovery.

This is Planning Step 10 of the 10-step planning process. This chapter provides an overview of the overall strategy for plan implementation and maintenance and outlines the method and schedule for monitoring, updating, and evaluating the plan. This chapter also discusses incorporating the plan into existing planning mechanisms and how to address continued public involvement.

Chapter 3 Planning Process includes information on the implementation and maintenance process since the 2010 plan was adopted. This Section 7 includes information on the implementation and maintenance process specific to this plan update

7.1 Implementation

Once adopted, the plan faces the truest test of its worth: implementation. While this plan contains many worthwhile mitigation policies and actions, the participating jurisdictions will need to decide which to undertake first. Two primary factors will help with making that decision: the priority assigned the actions in the planning process and funding availability. Competing priorities within a community may pose a challenge to plan implementation. Strategies to consider in plan implementation include:

- Implementation of low or no-cost actions most easily demonstrate progress toward successful plan implementation. This may include projects requiring only staff time.
- Develop strong messaging and selling points to obtain community support and political backing.
- Identify local champions and mitigation partners for priority actions.
- Utilize available mentoring and technical resources to assist with implementation strategies.
- Monitor potential funding sources and opportunities.

An important implementation mechanism that is highly effective and low-cost is incorporation of the hazard mitigation plan recommendations and their underlying principles into other plans and mechanisms, such as

general plans, CWPPs, and capital improvements program, and others for Calaveras County and participating jurisdictions. The County and participating jurisdictions already implement policies and programs to reduce losses to life and property from hazards. This plan builds upon the momentum developed through previous and related planning efforts and mitigation programs and recommends implementing actions, where possible, through these other program mechanisms.

Mitigation is most successful when it is incorporated into the day-to-day functions and priorities of government and development. Implementation will be accomplished by adhering to the schedules identified for each action and through constant, pervasive, and energetic efforts to network and highlight the multi-objective, win-win benefits to each program and the Calaveras County community and its stakeholders. This effort is achieved through the routine actions of monitoring agendas, attending meetings, and promoting a safe, sustainable community. Additional mitigation strategies could include consistent and ongoing enforcement of existing policies and vigilant review of programs for coordination and multi-objective opportunities. Simultaneous to these efforts, it is important to maintain a constant monitoring of funding opportunities that can be leveraged to implement some of the more costly recommended actions.

This will include creating and maintaining a bank of ideas on how to meet local match or participation requirements. When funding does become available, the participating jurisdictions will be in a position to capitalize on the opportunity. Funding opportunities to be monitored include special pre- and post-disaster funds, state and federal earmarked funds, benefit assessments, and other grant programs, including those that can serve or support multi-objective applications.

7.1.1. Role of Hazard Mitigation Planning Committee in Implementation and Maintenance

With adoption of this plan, the participating jurisdictions will be responsible for the plan implementation and maintenance. Calaveras County and the City of Angels Camp agree to continue its relationship with the HMPC Steering Committee and:

- Act as a forum for hazard mitigation issues;
- Disseminate hazard mitigation ideas and activities to all participants;
- Pursue the implementation of high-priority, low/no-cost recommended actions;
- Ensure hazard mitigation remains a consideration for community decision makers;
- Maintain a vigilant monitoring of multi-objective cost-share opportunities to help the community implement the plan's recommended actions for which no current funding exists;
- Monitor and assist in implementation and update of this plan;
- Report on plan progress and recommended changes to the various governing boards or councils of all participating jurisdictions; and
- Inform and solicit input from the public.

The primary duty of the participating jurisdictions is to see the plan successfully carried out and to report to their community governing boards and the public on the status of plan implementation and mitigation opportunities. Other duties include reviewing and promoting mitigation proposals, considering stakeholder concerns about hazard mitigation, passing concerns on to appropriate entities, and posting relevant information on the County website (and others as appropriate).

7.2 Maintenance

Plan maintenance is the process of monitoring and evaluating plan implementation and to update the plan as progress, roadblocks, or changing circumstances are recognized. It also includes the method and schedule of monitoring, evaluating, and updating the plan within a 5-year cycle.

7.2.1. Maintenance Schedule

The Calaveras County OES in conjunction with the County CAO is responsible for initiating plan reviews and consulting with the City of Angels Camp. In order to monitor progress and update the mitigation strategies identified in the action plan, Calaveras County OES and CAO and the standing HMPC will revisit this plan annually and following a hazard event. The HMPC will also submit a five-year written update to the State and FEMA Region IX, unless disaster or other circumstances (e.g., changing regulations) require a change to this schedule. With this plan update anticipated to be fully approved and adopted in early 2016, the next plan update for the Calaveras County Planning Area will occur in 2021.

7.2.2. Maintenance Evaluation Process

The Plan maintenance process provides a standardized approach to ensuring that the mitigation strategy is implemented according to plan and is sustainable over the long term. Evaluation of implementation progress can be achieved by monitoring changes in vulnerabilities identified in the plan. Changes in vulnerability can be identified by noting:

- Decreased vulnerability as a result of implementing recommended actions;
- Increased vulnerability as a result of failed or ineffective mitigation actions; and/or
- Increased vulnerability as a result of new development (and/or annexation).

Updates to this plan will:

- Consider changes in vulnerability due to action implementation;
- Document success stories where mitigation efforts have proven effective;
- Document areas where mitigation actions were not effective;
- Document any new hazards that may arise or were previously overlooked;
- Incorporate new data or studies on hazards and risks;
- Incorporate new capabilities or changes in capabilities;
- Incorporate changes in community asset and infrastructure inventories,
- Incorporate growth and development-related changes;
- Incorporate new action recommendations or changes in action prioritization; and
- Document progress and changes to the overall community mitigation program and community priorities.

Changes will be made to the plan to accommodate for actions that have failed or are not considered feasible after a review of their consistency with established criteria, time frame, community priorities, and/or funding resources. All mitigation actions will be reviewed as well during the monitoring and update of this plan to determine feasibility of future implementation. Updating of the plan will be by written changes and

submissions, as the HMPC deems appropriate and necessary, and as approved by the appropriate governing boards or councils of the other participating jurisdictions. In keeping with the five-year update process, the HMPC will convene public meetings to solicit public input on the plan and its routine maintenance and the final product will be adopted by the governing boards or councils.

7.2.3. Incorporation into Existing Planning Mechanisms

Another important implementation mechanism that is highly effective is incorporation of the hazard mitigation plan's underlying principles and mitigation strategy into other county and city plans and mechanisms. Where possible, plan participants will use existing plans and/or programs to implement hazard mitigation actions. As previously stated in Section 7.1 of this plan, mitigation is most successful when it is incorporated into the day-to-day functions and priorities of government and future land use planning. The point is re-emphasized here. As described in this plan's capability assessment, the County and participating jurisdictions already implement policies and programs to reduce losses to life and property from hazards. This plan builds upon the momentum developed through previous and related planning efforts and mitigation programs and recommends implementing actions, where possible, through these other program mechanisms. These existing mechanisms include

- County and City general plans
- County and City Emergency Operations Plans
- County and City ordinances
- Flood/stormwater management/master plans
- Capital improvement plans and budgets
- Community Wildfire Protection Plans
- Other plans, policies, and programs outlined in the capability assessments in the jurisdictional annexes
- Other plans, regulations, programs, and practices with a mitigation focus

HMPC members involved in these other planning mechanisms will be responsible for integrating the findings and recommendations of this plan with these other plans, programs, etc., as appropriate. As described in Section 7.1, incorporation into existing planning mechanisms will be done through the routine actions of:

- monitoring other planning/program agendas;
- attending other planning/program meetings;
- participating in other planning processes; and
- monitoring community budget meetings for other community program opportunities.

The successful implementation of this mitigation strategy will require constant and vigilant review of existing plans and programs for coordination and multi-objective opportunities that promote a safe, sustainable community. Examples of incorporation of the Local Hazard Mitigation Plan into existing planning mechanisms include:

1. As recommended by Assembly Bill 2140, each community should adopt (by reference or incorporation) this LHMP into the Safety Element of their General Plan(s). Evidence of such adoption (by formal, certified resolution) shall be provided to CAL OES and FEMA.

2. Integration of mitigation actions identified in this mitigation strategy with the actions and implementation priorities established in annual Capital Improvement programs and budgets.
3. Using the risk assessment information to update the hazard analysis in the Calaveras County Emergency Operations Plan.
4. Integration of the risk assessment information into future updates of Community Wildfire Protection Plans

Efforts should continuously be made to monitor the progress of mitigation actions implemented through these other planning mechanisms and, where appropriate, priority actions from these other plans should be incorporated into updates of this Calaveras County LHMP.

7.2.4. Continued Public Involvement

Continued public involvement is imperative to the overall success of the plan's implementation. The update process provides an opportunity to solicit participation from new and existing stakeholders and to publicize success stores from the plan implementation and seek additional public comment. The plan maintenance and update process will include continued public and stakeholder involvement and input through attendance at designated committee meetings, web postings, press releases to local media, social media mechanisms, and through public meetings.

When the HMPC reconvenes for the update, they will coordinate with all stakeholders participating in the planning process—including those that joined the effort since the planning process began—to update and revise the plan. In reconvening, Calaveras County OES and CAO, and the HMPC will identify a public outreach subcommittee, which will be responsible for coordinating the activities necessary to involve the greater public. The subcommittee will develop a plan for public involvement and will be responsible for disseminating information through a variety of media channels detailing the plan update process. As part of this effort, public meetings will be held and public comments will be solicited throughout the planning process and on the plan update draft.

Annex A City of Angels Camp

A.1 Introduction

This Annex details the hazard mitigation planning elements specific to the City of Angels Camp, a participating jurisdiction to the Calaveras County Local Hazard Mitigation Plan (LHMP). This annex is not intended to be a standalone document, but supersedes and supplements the information contained in the base plan document. As such, all sections of the base plan, including the planning process and other procedural requirements apply to and were met by the City. This annex provides additional information specific to the City of Angels Camp, with a focus on providing additional details on the risk assessment and mitigation strategy for this community.

A.2 Planning Process

As described above, the City of Angels Camp followed the planning process detailed in Section 3.0 of the base plan. In addition to providing representation on the Calaveras County Hazard Mitigation Planning Committee (HMPC), the City formulated their own internal planning team to support the broader planning process requirements. LHMP planning participants included staff from the following City departments:

- Steve Flaigg – Building Inspector
- Colleen Haerr – City Engineer
- David Myers – City Engineer
- David Hanham – Planning Director
- Nathan Pry, Deputy Chief/Fire Marshall
- Todd Fordahl – Angels Camp Police Department

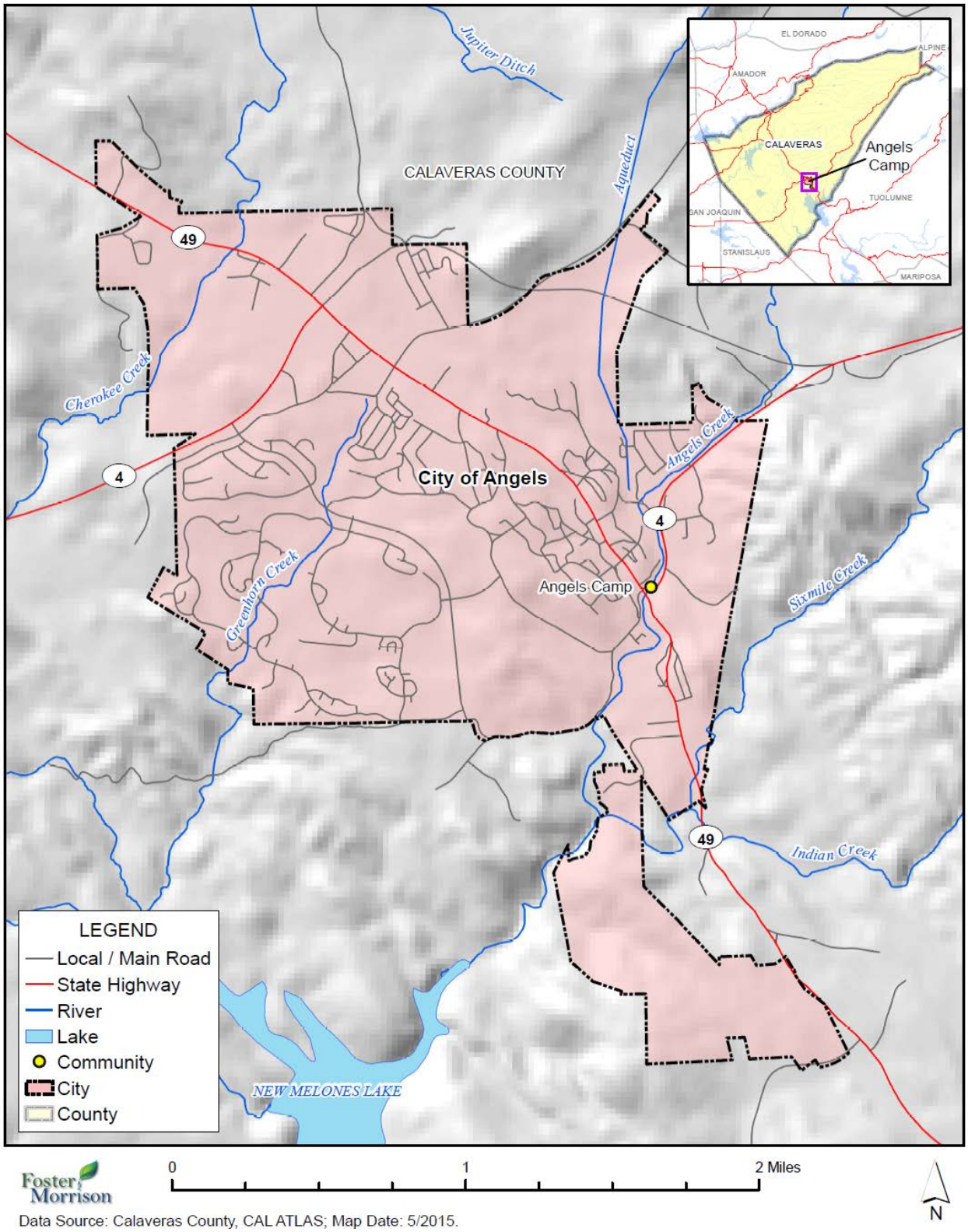
The City of Angels is a small city and so while only two of the City employees were able to attend the second planning committee meeting, much of the coordination was accomplished by emails, phone calls, and in-house discussions. The in-house discussion meetings were held by two or three people at any one time and all of the participants had a chance to review the material and provide data and input to the City of Angel's Camp Annex.

Additional details on plan participation and City representatives are included in Appendix A.

A.3 Community Profile

The community profile for the City of Angels Camp is detailed in the following sections. Figure A-1 displays a map and the location of the City of Angels Camp within Calaveras County.

Figure A-1 City of Angels Camp Base Map



Data Source: Calaveras County, CAL ATLAS; Map Date: 5/2015.

A.3.1. Geography and Location

Angels Camp is situated in the southern-central portion of Calaveras County at 1,379 feet above sea level. This location is in the western foothills of the Sierra Nevada Range, typically above the winter fog of the lower valley and below most of the snow of the high Sierras. Highway 49 is the main north-south arterial and Highway 4 is the main east-west arterial. Cherokee Creek crosses the northwestern section of the city. Angels Creek, Sixmile Creek and Indian Creek converge to form the Middle Fork Stanislaus River near the south end of town.

A.3.2. History

The history of Angels Camp is similar to many of the towns formed in the mid-19th century during the California's Gold Rush. During the first few years, there were as many as 4,000 miners working the surface gold of Angels in the one mile area from Angels Creek to Utica Park. This source played out quickly, but as the legend goes, Bennegar Rasberry fired his muzzle loader into the ground and split a stone to reveal gold inside, thus initiating the era of hard rock mining in Angels Camp.

The main quartz vein extended from southern Altaville to Angels Creek and all along Main Street of early Angels Camp. The estimated gross recovery of gold from the 5 primary mines from 1886 to 1910 was $19,985,747 and Angels Creek ran chalky white from the mill wastes.

Mark Twain based his short story "The Celebrated Jumping Frog of Calaveras County" on a story he claimed he heard at the Angels Hotel. The event is commemorated to this day with a Jumping Frog Jubilee in May each year at the Calaveras County Fairgrounds, just southeast of Angels Camp.

A.3.3. Economy

US Census estimates show economic characteristics for the City of Angels Camp. These are shown in Table A-1.

Table A-1 City of Angels Camp Civilian Employed Population 16 years and Over

Industry	Estimated Employment	Percent
Agriculture, forestry, fishing and hunting, and mining	0	0.0%
Construction	171	11.1%
Manufacturing	185	12.0%
Wholesale trade	21	1.4%
Retail trade	107	6.9%
Transportation and warehousing, and utilities	138	8.9%
Information	17	1.1%
Finance and insurance, and real estate and rental and leasing	67	4.3%
Professional, scientific, and management, and administrative and waste management services	63	4.1%
Educational services, and health care and social assistance	447	29.0%

Industry	Estimated Employment	Percent
Arts, entertainment, and recreation, and accommodation and food services	52	3.4%
Other services, except public administration	55	3.6%
Public administration	219	14.2%

Source: US Census Bureau American Community Survey 2009-2013 Estimates

A.3.4. Population

The California Department of Finance estimated the population of the City of Angels Camp to be 3,726 in January of 2014.

A.4 Hazard Identification and Summary

This section details how the risk varies across the City of Angels Camp planning area. The City's planning team identified the hazards that affect the City and summarized their frequency of occurrence, spatial extent, potential magnitude, and significance specific to Angels Camp (see Table A-2). In the context of the plan's planning area, there are no hazards that are unique to Angels Camp.

Information on past occurrences and the likelihood of future occurrences is detailed in Section 4, Risk Assessment, of the base plan. Additional information for high and medium significant hazards for the City is included in the Vulnerability Assessment section of this Annex.

Table A-2 City of Angels Camp Hazard Identification Table

Hazard	Geographic Extent	Probability of Future Occurrences	Magnitude/ Severity	Significance
Agricultural Hazards	Limited	Occasional	Negligible	Medium
Avalanche	Limited	Likely	Negligible	Low
Dam Failure	Limited	Occasional	Catastrophic	Medium
Drought and Water Shortage	Extensive	Occasional	Critical	High
Earthquake	Significant	Occasional	Limited	Low
Flood 100/500 year	Significant	Occasional	Critical	Medium
Flood: Localized Stormwater Flooding	Limited	Likely	Limited	Med/High
Landslides and Debris Flows	Limited	Occasional	Limited	Low
Levee Failure	Limited	Unlikely	Negligible	Low
Severe Weather: Extreme Heat	Extensive	Highly Likely	Limited	Low
Severe Weather: Heavy Rains and Storms	Extensive	Likely	Critical	High
Severe Weather: Winter Storms and Extreme Cold	Extensive	Highly Likely	Critical	Medium
Severe Weather: Wind (include tornadoes)	Extensive	Likely	Limited	Medium
Volcano	Extensive	Unlikely	Critical	Low
Fire: Wildfire	Significant	Likely	Limited	Medium

Geographic Extent
Limited: Less than 10% of planning area
Significant: 10-50% of planning area
Extensive: 50-100% of planning area

Probability 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—10-25 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

A.5 Vulnerability Assessment

The intent of this section is to assess Angels Camp's vulnerability separate from that of the planning area as a whole, which has already been assessed in Section 4.3 Vulnerability Assessment of the base plan. This vulnerability assessment provides an inventory of the population, property, and other assets located within the City and further analyzes those assets at risk to identified hazards ranked of medium or high significance (as listed in Table A-2) to the community. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the main plan.

A.5.1. Total Assets at Risk

This section identifies Angels Camp's total assets at risk, including values at risk, critical facilities and infrastructure, natural resources, and historic and cultural resources. Growth and development trends are also presented for the community. This data is not hazard specific, but is representative of total assets at risk within a community.

Values at Risk

The following data from the Calaveras County Assessor's Office is based on the 2014 Assessor's data. This data should only be used as a guideline to overall values in the County, as the information has some limitations. The most significant limitation is created by Proposition 13. Instead of adjusting property values annually, the values are not adjusted or assessed at fair market value until a property transfer occurs. As a result, overall value information is most likely low and does not reflect current market value of properties within the County. It is also important to note, in the event of a disaster (depending on the type), it is generally the value of the infrastructure or improvements to the land that is of concern or at risk. Generally, the land itself is not a loss. More information on the methodology is shown in Section 4.3.1 of the base plan. Table A-3 shows the Assessor's values (e.g., the values at risk) broken down by property type for the City of Angels Camp.

Table A-3 City of Angels Camp Total Exposure

Property Use	Total Parcel Count	Total Land Value	Improved Parcel Count	Improved Structure Value	Improved Other Value	Total Value
Agriculture	36	$4,625,506	16	$2,572,278	$19,700	$7,217,484
Commercial	141	$15,594,025	123	$51,379,185	$2,315,509	$69,288,719
Institutional	20	$55,249	1	$105,476	$0	$160,725
Other	167	$1,530,629	22	$6,053,579	$20,740	$7,604,948
Residential	1,784	$84,723,074	1,434	$263,550,850	$525,489	$348,799,413
Vacant Land	84	$7,099,919	3	$835,793	$0	$7,935,712
Total	**2,232**	**$113,628,402**	**1,599**	**$332,017,161**	**$2,881,438**	**$441,007,001**

Source: Calaveras County 2014 Assessor's Data

Critical Facilities and Infrastructure

For purposes of this plan, a critical facility is defined as:

> *Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.*

This definition was refined by separating out three categories of critical facilities as further described in Section 4.3.1 of the base plan. These categories include At-Risk Populations, Essential Services, and Hazardous Materials Facilities.

An inventory of critical facilities in the City of Angels Camp from Calaveras County GIS is provided in Table A-4 and shown on Figure A-2. Details of critical facility definition, type, name, address, and jurisdiction by hazard zone are listed in Appendix F.

Table A-4 City of Angels Camp Critical Facilities: Summary Table

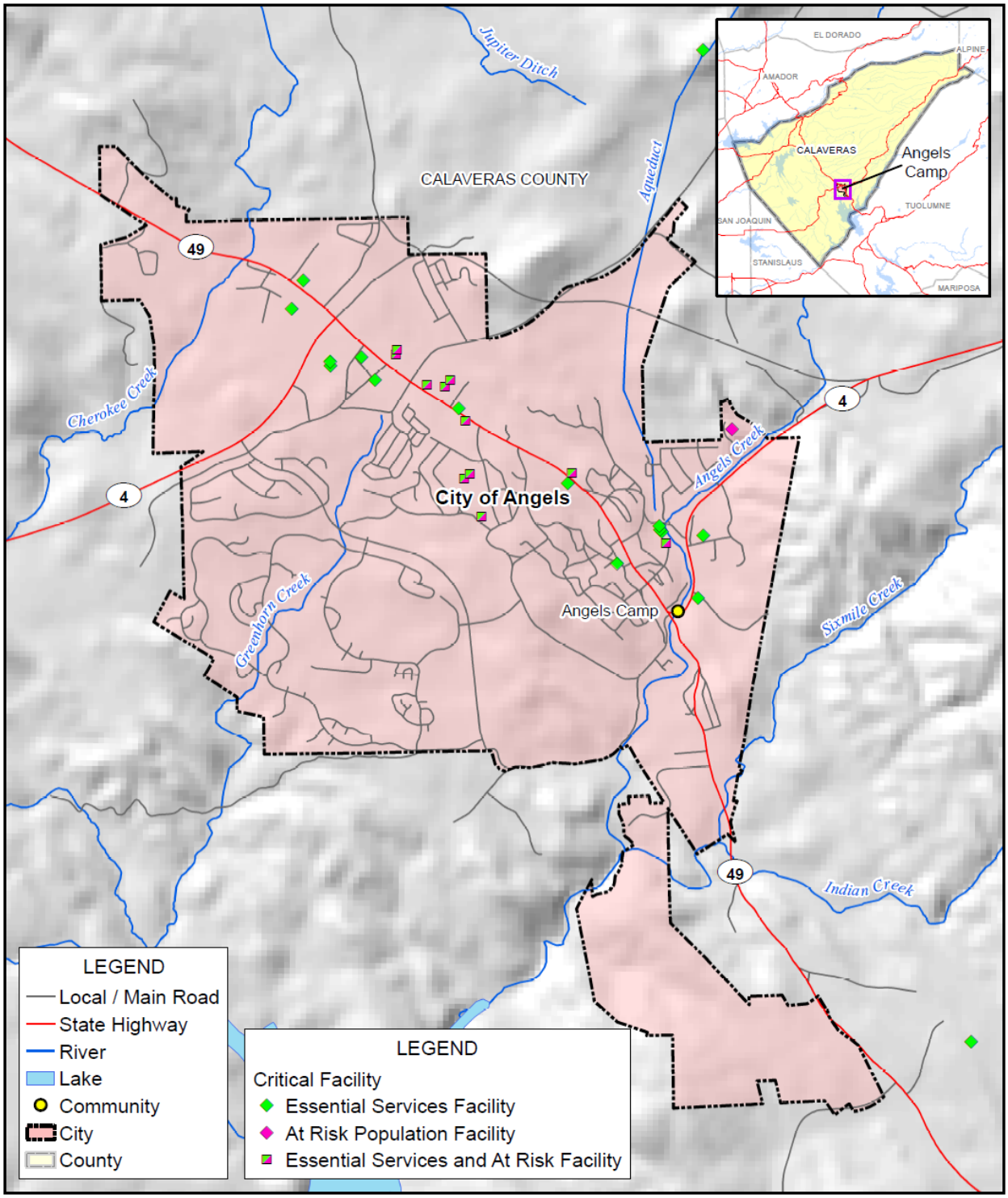
Category	Type	Facility Count
At Risk Population Facilities	Congregate Care Facility	1
	School	0
Essential Services Facilities	Community Food Bank/Pantry	4
	Emergency Medical	1
	Fire Station	4
	Government Operations	1
	Medical Health Facility	2
	Police	1
	Power Utility	1
Hazardous Materials Facilities	Hazardous Materials Facilities	0
At Risk Population and Essential Services Facilities	School/Emergency Shelter	11
Total City of Angels Camp		**26**

Source: Calaveras County GIS

In addition to these facilities, the City noted four facilities that were not included in the GIS analysis of critical facilities.

- Amerigas Propane distribution center
- PG&E's Helio-pad
- Calaveras Lumber
- The Foundry

Figure A-2 City of Angels Camp Critical Facilities



Foster Morrison

0 1 2 Miles

N

Data Source: Calaveras County, CAL ATLAS; Map Date: 9/2015.

Natural Resources

The city's Sphere of Influence includes the following habitat types:

- Blue-oak foothill-pine woodlands
- Chaparral (mixed, chamise)
- Pasture (irrigated and non-irrigated)
- Natural springs
- Reservoirs, Ponds
- Annual grasslands
- Blue-oak woodlands
- Valley foothill riparian (streams)
- Valley oak woodlands

A number of special status plant and animal species as defined by the U.S. Fish and Wildlife Service (USFW), California Department of Fish and Game (CDFG) and California Native Plant Society (CNPS) occur in the Angels Camp geographic sphere of influence. Table A-5 lists these special status species.

Table A-5 Special Status Plant and Animal Species Occurring or with the Potential to Occur Within the Angela Camp Sphere of Influence

Common Name	Scientific Name	Status
Invertebrates		
Valley elderberry longhorn beetle	*Desmocerus californicus dimorph*us	FT
Reptiles		
Western pond turtle	*Clemmys marmorata*	SSC
Amphibians		
California tiger salamander	*Abystoma californiense*	FC, SSC
California red-legged frog	*Rana aurora draytonii*	FC, SSC
Foothill yellow-legged frog	*Rana boylii*	SSC
Western spadefoot	*Scaphiopus hammondi*	SSC
Birds		
Cooper's hawk	*Accipiter cooperi*	SSC
Sharp-shinned hawk	*Accipiter striatus*	SSC
Tricolored blackbird	*Agelaius tricolor*	SSC
Golden eagle	*Aquila chrysaetos*	SSC, BGEPA
Ferruginous hawk	*Buteo regalis*	SSC
Willow flycatcher, nesting	*Empidonax traillii extemis*	FE
White-tailed kite	*Elanus leucurus*	SA, FPS
Merlin	*Falco mexicanus*	SSC
Bald eagle – wintering	*Haliaetus leucocephalus*	FT, BGEPA
Loggerhead shrike	*Lanius ludovicianus*	SSC
California horned lark	*Phrynosoma coronatum frontale*	SSC
Burrowing owl	*Speotyto cunicularia*	SSC
Mammals		
Pallid bat	*Antrozous pallidus*	SSC
Ringtail	*Bassaricus astutus*	FPS
Greater western mastiff bat	*Eumops perotis californicus*	SSC
Western red bat	*Lasiurus blossevilli*	SSC
Pale big-eared bat	*Plecotus townsendii pallescens*	SA
Pacific western big-eared bat	*Plecotus townsendii townsendii*	SA
Plants		
Ione manzanita	*Arctostaphylos myrtifolia*	CNPS 1B, FT
Chinese Camp brodiaea	*Brodiaea pallida*	CNPS 1B, FT, SE
Hoover's calycadenia	*Calycadenia hooveri*	CNPS 1B
Mariposa cryptantha	*Cryptantha mariposae*	CNPS 1B

Common Name	Scientific Name	Status
Tuolumne button celery	*Eryngium pinnatisectum*	CNPS 1B
Parry's horkelia	*Horkelia parryi*	CNPS 1B
Veined water lichen	*Hydrothyria venosa*	USDA
Ahart's dwarf rush	*Juncus leiospermus var. ahartii*	CNPS 1B
Stebbin's lomatium	*Lomatium stebbinsii*	CNPS 1B
Pansy monkeyflower	*Mimulus pulchellus*	CNPS 1B
Whipple's monkeyflower	*Mimulus whipplei*	CNPS 1A
Tongue-leaf copper moss	*Scopelophila cataractae*	CNPS 2

Status Key
CNPS 1A California Native Plant Society, List 1A: Presumed extinct in California, but may occur or be re-discovered during the life of the plan.
CNPS 1B California Native Plant Society List 1B: Plants rare, threatened or endangered in California or elsewhere
CNPS 2 California Native Plant Society List 2: Plants rare, threatened or endangered in California, but more common elsewhere
CNPS 3 California Native Plant Society List 3: More information needed
FT: Federally listed, threatened (Federal Endangered Species Act)
FE: Federally listed, endangered (Federal Endangered Species Act)
FC: Federal candidate for listing (Federal Endangered Specie Act)
SE: State listed, endangered (California Endangered Species Act)
SSC: Species of Special Concern (California Department of Fish and Game, CDFG)
SA: California Natural Diversity Database Special Animal (California Department of Fish and Game, CDFG). May include animals considered endangered or rare pursuant to Section 15380(d) of the CEQA guidelines; animals that are biologically rare, very restricted in distribution or declining throughout their range; population(s) in California that may be peripheral to the major portion of the animal's range, but which are threatened with extirpation in California; and animals closely associated with habitat that is declining in California (e.g., wetlands, riparian, native grasslands); this category may apply to species at specific life stages (e.g., wintering, breeding, nesting).
BGEPA Bald and Golden Eagle Protection Act (United States Code Sections 668-668d)
FPS: Fully protected species, California Department of Fish and Game (California Fish and Game Code Section 4700 of Chapter 8; Section 5050 of Chapter 2, Division 6; and Chapter 1, Section 5515)
USDA: United States Department of Agriculture, Forest Service, Sensitive Species

Source: Angels Camp General Plan, Appendix 4 Conservation and Open Space

Historic and Cultural Resources

Angels Camp has a stock of historically significant homes, public buildings, and landmarks. To inventory these resources, the HMPC collected information from a number of sources. The California Department of Parks and Recreation Office of Historic Preservation (OHP) was the primary source of information. The OHP is responsible for the administration of federally and state mandated historic preservation programs to further the identification, evaluation, registration, and protection of California's irreplaceable archaeological and historical resources. OHP administers the National Register of Historic Places, the California Register of Historical Resources, California Historical Landmarks, and the California Points of Historical Interest programs. Each program has different eligibility criteria and procedural requirements. These requirements are detailed in Section 4.3.1 of the base plan. Historical resources included in the programs above are identified in Table A-6.

Table A-6 Angels Camp – OHP Historical Resources

Name/Landmark Plaque Number	National Register	State Landmark	California Register	Point of Interest	Date Listed	Town
Angels Camp (287)		X			2/4/1938	Angels Camp
Angels Hotel (734)	X	X			4/8/1960	Angels Camp
Calaveras County Bank (N1366)	X				8/1/1985	Angels Camp
Choy, Sam, Brick Store (N1309)	X				9/20/1984	Angels Camp
Utica Mansion (N1290)	X				5/31/1984	Angels Camp

Source: California Office of Historic Preservation

It should be noted that as defined by the National Environmental Policy Act (NEPA), any property over 50 years of age is considered a historic resource and is potentially eligible for the National Register. Thus, in the event that the property is to be altered, or has been altered, as the result of a major federal action, the property must be evaluated under the guidelines set forth by NEPA. Structural mitigation projects are considered alterations for the purpose of this regulation.

Growth and Development Trends

Past Growth and Current Land Use

Table A-7 shows the population of Angels Camp since its incorporation in 1912. Growth has been steady since the 1970s.

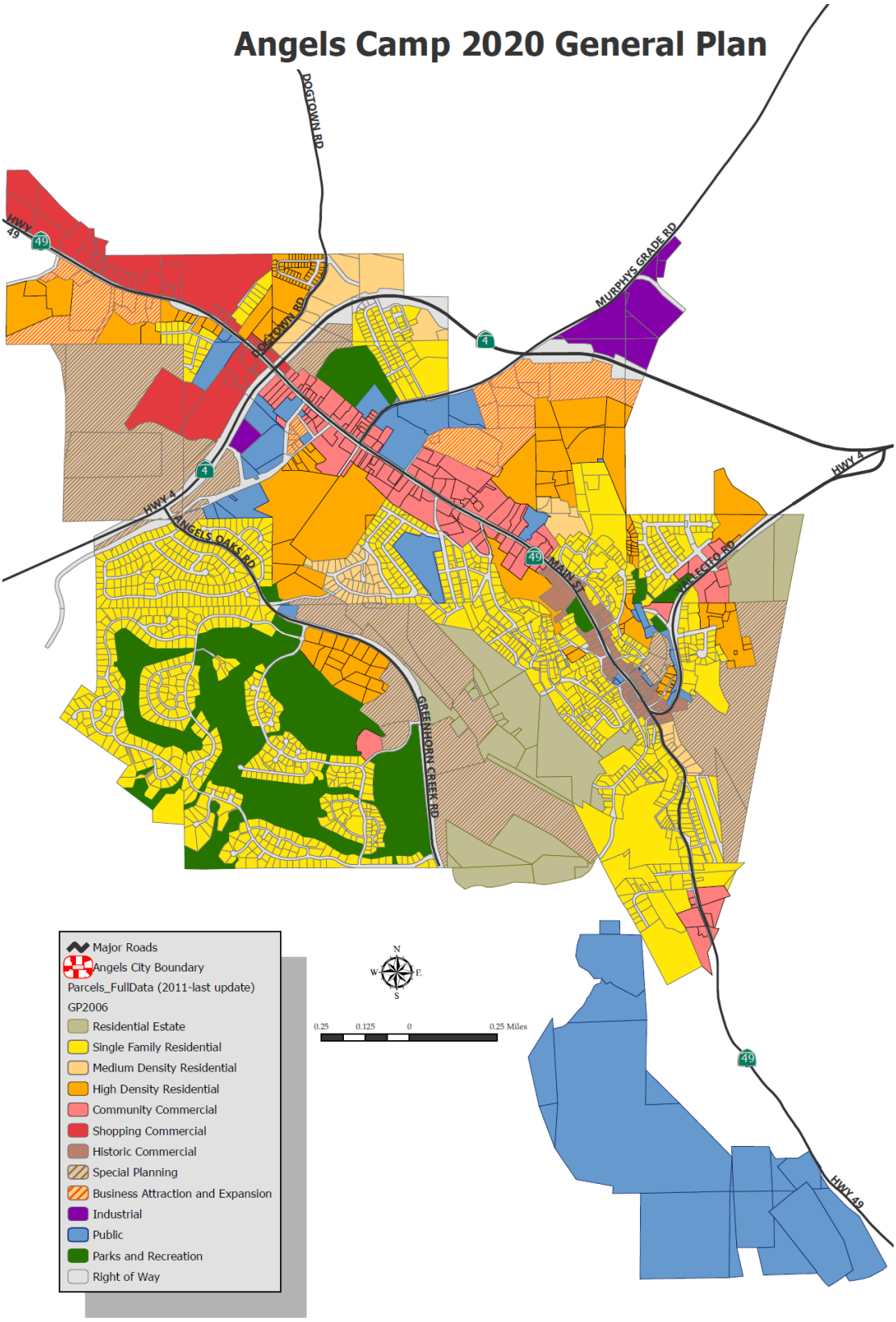
Table A-7 City of Angels Camp Historical Population Growth

Year	Population	Population Change	Population Percent Change
1912	4,000	–	–
1920	941	-3,509	-
1930	915	-26	-2.8%
1940	1,163	248	27.1%
1950	1,147	-16	-1.4%
1960	1,121	-26	-2.3%
1970	1,710	589	52.5%
1980	2,302	592	34.6%
1990	2,409	107	4.6%
2000	3,004	595	24.7%
2010	3,836	832	27.7%
2014	3,726	-110	-2.9%

Source: City of Angels Camp Housing Element, US Census Bureau, California Department of Finance

Land use from the General Plan 2020 document for the City is shown in Figure A-3.

Figure A-3 City of Angels Camp Land Use



Special Populations

Angels Camp noted that there are groups of people in the City who may need additional help during an emergency. These groups include low income and the elderly. Evacuations are difficult for the elderly and disabled. Low income residents may see increased effects from hazards as their ability to rebuild is limited. Language barriers may also occur.

Development since 2010 Plan

Angels Camp searched for buildings built in the City since the 2010 LHMP. There were 15 residential, 1 commercial, and 0 industrial buildings completed in the City limits since 2010. None were in the floodplain or in a very high wildfire severity areas.

Future Development

Table A-7 shows the population estimates of Angels Camp for the year 2020. The General Plan Land Use Element shows 3 separate scenarios, which are reproduced here.

Table A-8 City of Angels Camp Historical Population Growth

Projection	% Growth Rate	Projected 2020 Population
Low Projection	1.80%	4,622
General Plan 2020 Projection	2.16%	4,874
High Projection	2.25%	5,138

Source: City of Angels Camp General Plan Land Use Element

The HMPC noted that development in the City is primarily occurring in residential areas. There is expected to be light amounts of commercial and industrial development in the City. There are two approved planned projects for future development inside the City boundary.

- Mark Twain Family Medical Center at 590 Stanislaus Ave., APN# 058-024-016 in the City of Angels Camp CA. This will be a commercial development.
- De Nova Homes Classics on the Ridge on Mac Cauley Ranch Road APN# 058-046-014 in the City of Angels Camp. This is a residential development (R1-PD) consisting of 50+ single family residences.

Neither development is in a floodplain or a Very High Fire Hazard Zone.

A.5.2. Priority Hazards: Vulnerability Assessment

This section provides the vulnerability assessment, including any quantifiable loss estimates, for those hazards identified above in Table A-2 as high or medium significance hazards. Impacts of past events and vulnerability of the City to specific hazards are further discussed below (see Section 4.1 Hazard Identification in the base plan for more detailed information about these hazards and their impacts on the Calaveras County planning area). Methodologies for calculating loss estimates are the same as those described in Section 4.3 of the base plan. In general, the most vulnerable structures are those located within the floodplain or within dam inundation areas, structures and infrastructure located in WUI areas,

unreinforced masonry buildings, mobile homes, and buildings built prior to the introduction of modern building codes.

An estimate of the vulnerability of the City to each identified hazard, in addition to the estimate of risk of future occurrence, is provided in each of the hazard-specific sections that follow. 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. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **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 occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

Agricultural Hazards

Likelihood of Future Occurrence—Occasional
Vulnerability—Medium/Low

According to the US Department of Agriculture (USDA), every year natural disasters, such as droughts, earthquakes, extreme heat and cold, floods, fires, earthquakes, hail, landslides, and tornadoes, challenge agricultural production. Because agriculture relies on the weather, climate, and water availability to thrive, it is easily impacted by natural events and disasters. Agricultural impacts from natural events and disasters most commonly include: contamination of water bodies, loss of harvest or livestock, increased susceptibility to disease, and destruction of irrigation systems and other agricultural infrastructure. These impacts can have long lasting effects on agricultural production including crops, forest growth, and arable lands, which require time to mature.

Establishment of an invasive species would be detrimental to the agricultural industry of Calaveras County because of product losses, stringent quarantine regulations, loss of exporting opportunities and increased treatment costs. The introduction of exotic plants influences wildlife by displacing forage species, modifying habitat structure—such as changing grassland to a forb-dominated community—or changing species interactions within the ecosystem. In addition, invasive plants:

- Increase wildfire potential
- Reduce water resources
- Accelerate erosion and flooding
- Threaten wildlife
- Degrade rangeland, cropland, and timberland
- Diminish outdoor recreation opportunities.

An agricultural industry does exist inside the City, primarily livestock, small farming, and agricultural education at the school. In addition, agriculture is a $29 million industry in Calaveras County. Some of the revenue from agricultural production is spent in Angels Camp. The removal or reduction of this large source of revenue would affect local businesses and industries, and could remove a portion of the tax base that the City depends on to provide essential services.

Future Development

Ag hazards and the related economic impacts could affect future development. Should economic issues arise due to agricultural hazards, it may limit future development due to economic concerns.

Dam Failure

Likelihood of Future Occurrence—Occasional
Vulnerability—Medium

Dam failure could occur in one of the many high or significant hazard dams, both large or small, in Calaveras County, which could cause loss of life and property, flooding, interruption of transportation (in particular the Highway 4/49 bridges at the southern end of the city), communication systems, etc. The City's 2020 General Plan Safety Element reviewed the risk of dam failure to the City. The dams highlighted in the Safety Element are shown on Table A-9.

Table A-9 Dams with Potential to Affect Angels Camp

Name	Hazard	County	Owner	River	Near City	EAP
Ross	S	Calaveras	Jon & Angelita Janofsky	French Gulch	Angels City	Y
Holman	S	Calaveras	–	Angels Creek Tributary	–	Y

Source: Cal OES, National Performance of Dams Database

FERC regulations require the operators of these reservoirs to prepare an Emergency Action plan and inundation map indicating areas that could be affected by dam failure.

Failure of the dam at Ross Reservoir has the potential to inundate French Gulch and the Utica Ditch. The capacity of Ross Reservoir is 100 acre-feet. An analysis of the potential threat to people and property within Angels Camp from a failure of the Ross Reservoir Dam has not been conducted.

Failure of the dam at Holman Reservoir (the city's wastewater treatment facility) would result in flows into Angels Creek downstream of the city. While this failure would affect water quality within Angels Creek, it is not anticipated to create a threat to life or property within the city limits. Further, the city's drinking water supply is located well up-stream of the facility and is unlikely to be affected by failure of the Holman Reservoir dam.

It should be noted that, except for Holman and Ross dams, any "sudden" dam failure would take some time to reach the City, which would enable the City to evacuate. Findings from the Safety Element are presented below.

Results of a failure of the dam at the Union Public Utility District Water Treatment facility located near Murphy's has not been studied, but could result in inundation of portions of the city.

Future Development

Development is expected to continue to occur in the City. While future development may place more structures in the dam inundation areas, due to the low risk of dam failure, development will continue in these areas.

Drought and Water Shortage

Likelihood of Future Occurrence—Occasional
Vulnerability—High

Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate water is the most critical issue and is critical for manufacturing, tourism, recreation, and commercial and domestic use. As the population in the area continues to grow, so will the demand for water.

Based on historical information, the occurrence of drought in California, including the City of Angels Camp, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts is often extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. The vulnerability of the City of Angels Camp to drought is City-wide, but impacts may vary and include reduction in water supply and an increase in dry fuels.

The most significant qualitative impacts associated with drought in the planning area are those related to water intensive activities such as wildfire suppression and protection, municipal usage, commerce, tourism, and recreation. Voluntary conservation measures are typically implemented during extended droughts. A reduction of electric power generation and water quality deterioration are also potential problems. Drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding.

The City and the Union Public Utility District are related to the Utica Water and Power Authority (UWPA). The City receives its water from the UWPA, and the City is a co-owner of the Authority. UWPA has some of the oldest water rights in the State. The City uses 3-6$ of the water allocated to the UWPA through its water rights. The City suffered from the recent drought due to government action, not for a lack of supply or prioritization for farming or fish flows. The City had the foresight to secure their own water supply sufficient for their needs including drought times. Ironically, the water the City saved flowed to the Melones Reservoir, which then became the property of another water agency that had an abundance of water so that it was able to sell the excess.

Future Development

As the population in the area continues to grow, so will the demand for water. Water shortages in the future may be worsened by drought, as the City relies on surface water for its water source. Continued planning will be needed to account for population growth and increased water demands.

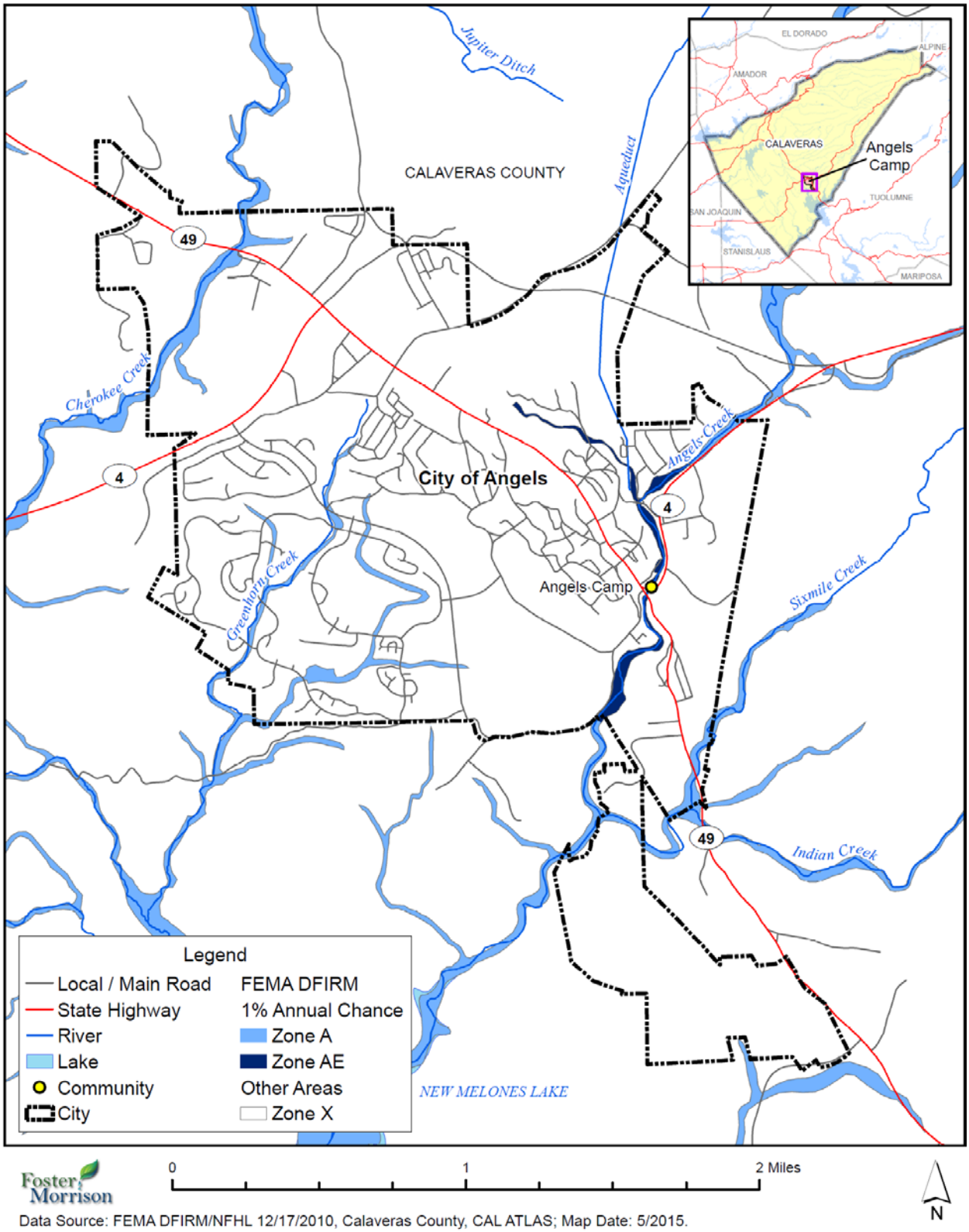
Flood: 100/500 year

Likelihood of Future Occurrence—Occasional
Vulnerability—Medium

As previously described in Section 4.2.11 of the main plan, the Calaveras County Planning Area and the City of Angels Camp have been subject to historical flooding. Within the City of Angels Camp, much of the flood damage occurs as a result of localized stormwater flooding, with limited flood damage occurring in the 100-year and greater floodplains.

The City of Angels Camp has properties in the 100-year flood zone as defined by the Federal Emergency Management Agency (FEMA). This can be seen in Figure A-4.

Figure A-4 City of Angels Camp DFIRM Flood Zones



Data Source: FEMA DFIRM/NFHL 12/17/2010, Calaveras County, CAL ATLAS; Map Date: 5/2015.

Assets at Risk

GIS was used to determine the possible impacts of flooding within the City of Angels Camp. The methodology described in Section 4.3.6 of the base plan was followed in determining structures and values at risk to the 1% annual chance flood event. Table A-10 and Table A-11 contain information for incorporated City of Angels Camp only. Table A-10 shows the number of improved parcels and associated structure and contents values at risk to the each of the FEMA flood zones by property use type using the DFIRM data in the unincorporated areas and Table A-11 shows potential losses summarized by 1% annual chance flood events with loss estimates and loss ratios. Methodology for the loss ratios was shown in Section 4.3.6 of the base plan.

Table A-10 City of Angels Camp – Count and Improved Value by Property Use and Detailed 1% Annual Chance Flood Zone

FEMA Flood Zone	Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Value	Total Value
Zone A	Agricultural	0	0	$0	$0	$0
	Commercial	2	2	$159,967	$373,144	$533,111
	Industrial	1	1	$146,626	$154,212	$300,838
	Institutional	0	0	$0	$0	$0
	Other	3	0	$2,721	$0	$2,721
	Residential	9	9	$630,883	$3,010,247	$3,641,130
	Vacant Land	13	1	$659,762	$315,000	$974,762
Total Zone A		**28**	**13**	**$1,599,959.00**	**$3,852,603.00**	**$5,452,562.00**
Zone AE	Agricultural	0	0	$0	$0	$0
	Commercial	1	1	$32,000	$208,000	$240,000
	Industrial	0	0	$0	$0	$0
	Institutional	2	0	$0	$0	$0
	Other	3	0	$8,295	$0	$8,295
	Residential	8	7	$313,431	$734,164	$1,047,595
	Vacant Land	5	0	$46,882	$0	$46,882
Total Zone AE		**19**	**8**	**$400,608.00**	**$942,164.00**	**$1,342,772.00**
Zone X	Agricultural	7	2	$24,911	$52,255	$77,166
	Commercial	132	116	$13,543,511	$42,688,750	$56,232,261
	Industrial	4	3	$191,786	$633,962	$825,748
	Institutional	46	15	$2,329,733	$15,338,831	$17,668,564
	Other	115	9	$884,492	$707,220	$1,591,712
	Residential	1,462	1,429	$71,027,258	$262,281,765	$333,309,023
	Vacant Land	419	4	$23,626,144	$881,049	$24,507,193

FEMA Flood Zone	Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Value	Total Value
Total Zone X		**2,185**	**1,578**	**$111,627,835.00**	**$322,583,832.00**	**$434,211,667.00**
Grand Totals		**2,232**	**1,599**	**$113,628,402**	**$327,378,599**	**$441,007,001**

Source; FEMA DFIRM 2010, Calaveras County Assessor's 2014 Data, County Parcel Layer 2013

Table A-11 City of Angels Camp – Flood Loss Estimates

Flood Zone	Improved Parcel Count	Improved Value	Estimated Contents Value	Total Value	Loss Estimate	Loss Ratio
1% Annual Chance	21	$4,794,767	$4,794,767	$9,274,534	$1,854,906.80	0.42%
Total	**21**	**$4,794,767**	**$4,794,767**	**$9,274,534**	**$1,854,906.80**	**0.42%**

Source; FEMA DFIRM 2010, Calaveras County Assessor's 2014 Data, County Parcel Layer 2013

According to Table A-10 and Table A-11, the City of Angels Camp has 21 improved parcels and $9,274,534 of structure and contents value in the 1% annual chance floodplain. These values can be refined a step further. Applying the 20 percent damage factor as previously described, there is a 1% chance in any given year of a flood event causing roughly $1,854,906.80 in damage in the City of Angels Camp. A loss ratio of 0.42% indicates that losses in Angels Camp to flood would be relatively minor, as less than half a percent of the total values in the City would be damaged. The remaining 1,578 improved parcels within the City are located outside of the 1% or 0.2% annual chance floodplains in Zone X.

Flooded Acres

Also of interest is the land area affected by the various flood zones. The following is an analysis of flooded acres in the City in comparison to total area within the City limits. The same methodology, as discussed in Section 4.3.6 of the base plan, was used for the City of Angels Camp as well as for the County as a whole. Table A-12 represents a detailed and summary analysis of total acres for each FEMA DFIRM flood zone in the City.

Table A-12 City of Angels Camp – Flooded Acres

Flood Zone	Property Use	Total Flooded Acres	Improved Flooded Acres	% of Improved Flooded Acres
Zone A	Agricultural	0.00	0.00	0.0%
	Commercial	28.96	28.96	100.0%
	Industrial	1.51	1.51	100.0%
	Institutional	0.00	0.00	0.0%
	Other	23.47	0.00	0.0%
	Residential	10.35	10.35	100.0%
	Vacant Land	46.51	39.47	84.9%

Flood Zone	Property Use	Total Flooded Acres	Improved Flooded Acres	% of Improved Flooded Acres
	Total Zone A	**110.8**	**80.29**	**72.5%**
Zone AE	Agricultural	0.00	0.00	0.0%
	Commercial	0.16	0.16	100.0%
	Industrial	0.00	0.00	0.0%
	Institutional	1.25	0.00	0.0%
	Other	0.93	0.00	0.0%
	Residential	2.14	2.01	94.3%
	Vacant Land	4.98	0.00	0.0%
	Total Zone AE	**9.46**	**2.17**	**22.9%**
Total 1%		**120.26**	**82.47**	**68.6%**
0.2% Chance	Agricultural	0.00	0.00	0.0%
	Commercial	0.00	0.00	0.0%
	Industrial	0.00	0.00	0.0%
	Institutional	0.00	0.00	0.0%
	Other	0.00	0.00	0.0%
	Residential	0.00	0.00	0.0%
	Vacant Land	0.00	0.00	0.0%
Total 0.2%		**0.00**	**0.00**	**0.0%**

Source: FEMA DFIRM 2010, County Parcel Layer 2013

Population at Risk

The DFIRM flood zones were overlayed on the parcel layer. Those residential parcel centroids that intersect the severity zones were counted and multiplied by the 2010 Census Bureau average household factors for Angels Camp. According to this analysis, there is a total population of 39 residents of the City at risk to flooding. This is shown in Table A-15.

Table A-13 City of Angels Camp – Count of Improved Residential Parcels and Population by Flood Zone

Flood Zone	Improved Residential Parcels	Population*
A	9	21
AE	8	18
Total	**17**	**39**

Source: Calaveras County 2014 Assessor's Data; FEMA DFIRM 2010, US Census Bureau

* Average household populations from the 2010 US Census were used: Angels Camp – 2.30.

Critical Facilities at Risk

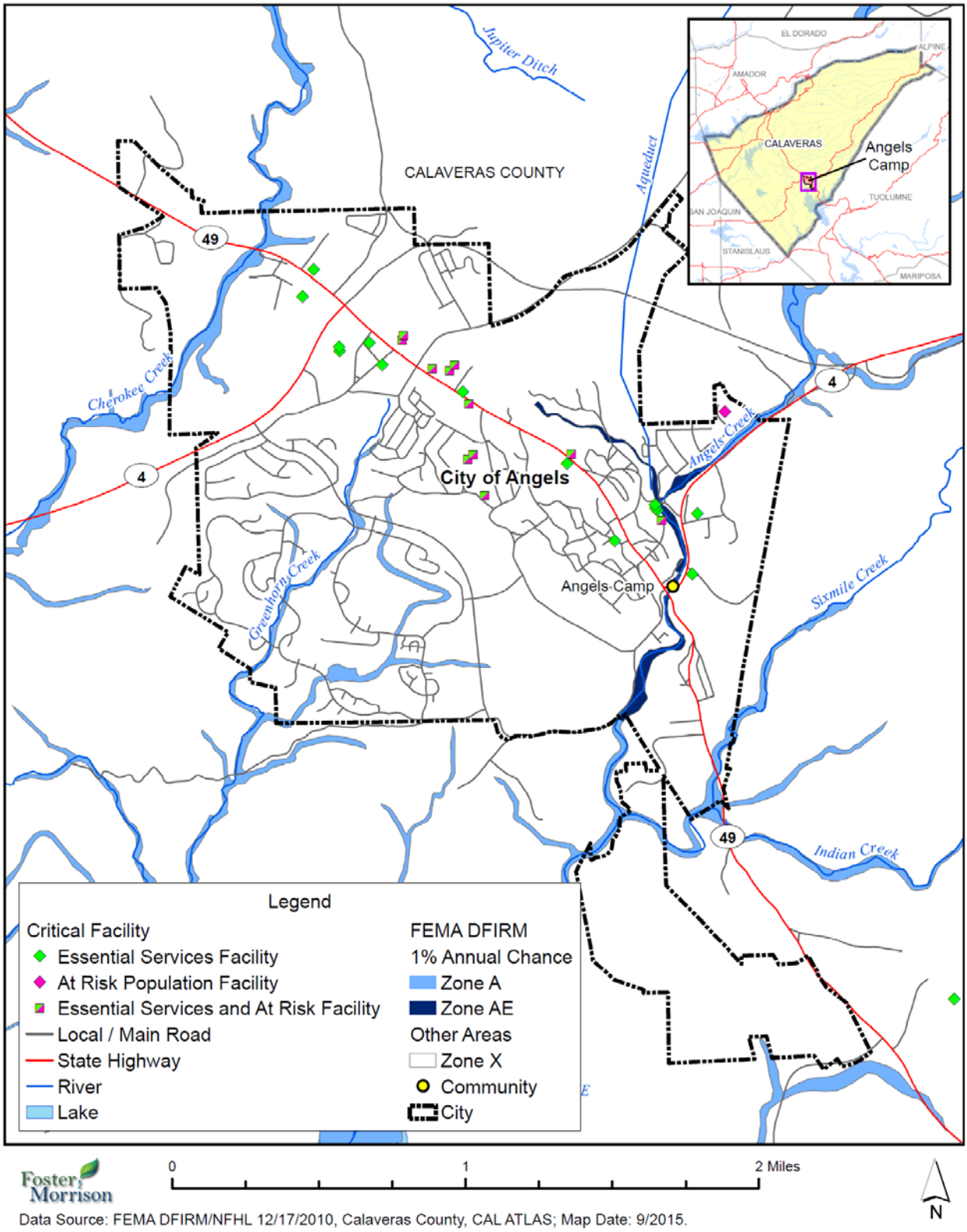
A separate analysis was performed on the critical facility inventory in Calaveras County and Angels Camp. GIS was used to determine whether the facility locations intersects a DFIRM flood hazard areas, and if so, which zone it intersects Details of critical facilities in the floodplain in the City of Angels Camp are shown in Figure A-5 and Table A-14. As shown on the table and figure, Angels Camp has no critical facilities located in DFIRM flood zones. Details of critical facility definition, type, name and address and jurisdiction by flood zone are listed in Appendix F.

Table A-14 City of Angels Camp Critical Facilities in DFIRM Flood Zones

Flood Zone	Category	Facility Count
0.2% Annual Chance	At Risk Population Facilities	-
	Essential Services Facilities	-
	Hazardous Materials Facilities	-
	Multiple Categories	-
	Total 0.2% Annual Chance	**0**
1% Annual Chance (Zone A, AE)	At Risk Population Facilities	-
	Essential Services Facilities	-
	Hazardous Materials Facilities	-
	Multiple Categories	-
	Total 1% Annual Chance	**0**

Source: Calaveras County GIS, FEMA DFIRM 2010

Figure A-5 City of Angels Camp Critical Facilities in DFIRM Flood Zones



Foster Morrison

Data Source: FEMA DFIRM/NFHL 12/17/2010, Calaveras County, CAL ATLAS; Map Date: 9/2015.

Insurance Coverage, Claims Paid, and Repetitive Loss

The City of Angels Camp joined the National Flood Insurance Program (NFIP) on September 4, 1984. The City does not participate in the CRS program. NFIP data indicates that as of September 15, 2014, there were 28 flood insurance policies in force in the City with $9,666,000 of coverage. There have been 3 historical claims for flood losses totaling $13,701. NFIP data further indicates that there are 0 repetitive loss (RL) and 0 severe repetitive loss buildings in the City.

Future Development

No development is expected to occur in the floodplain in the City. If development were to occur, it would be subject to the development standards of the City's floodplain ordinance.

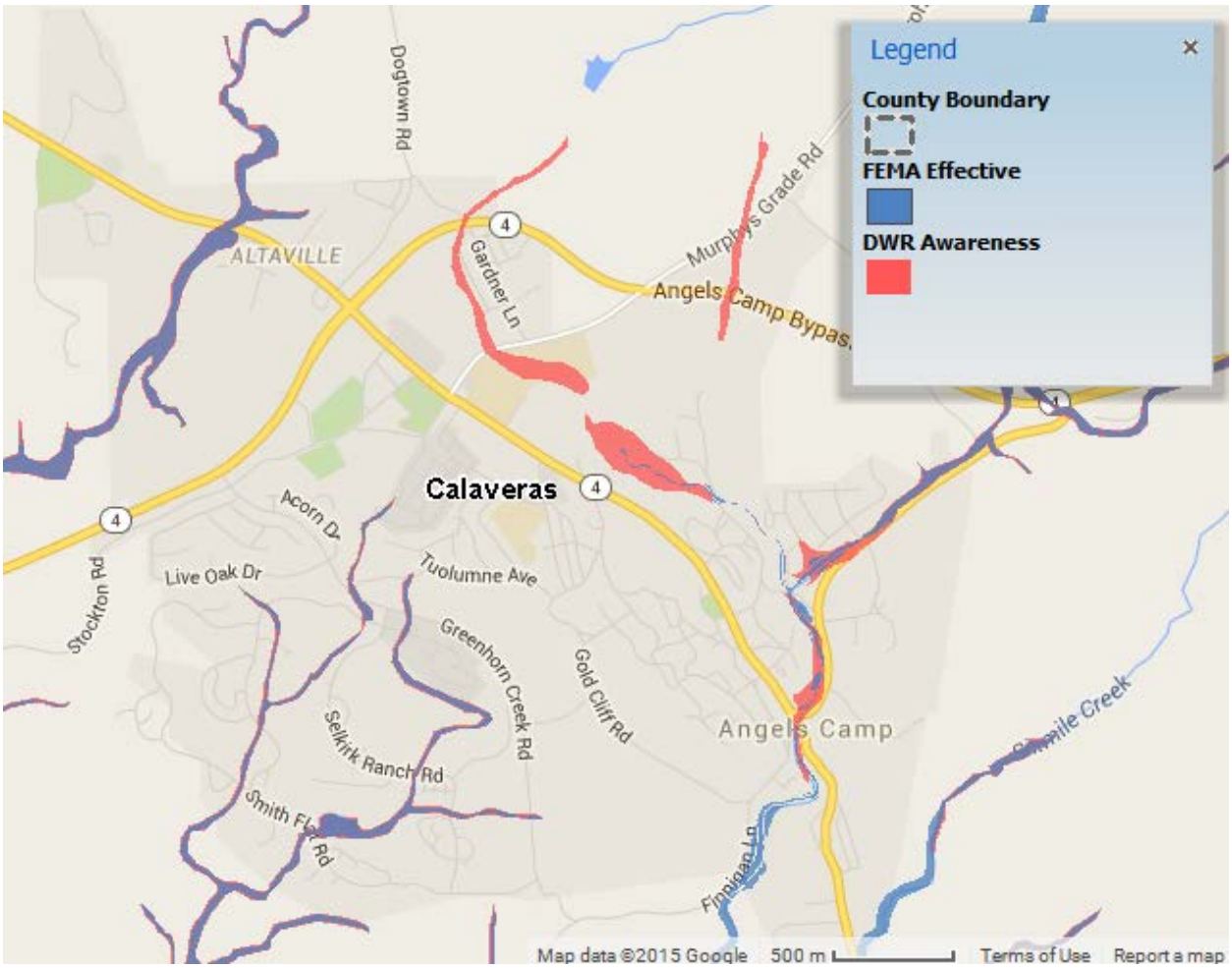
California Department of Water Resources Best Available Maps (BAM)

The FEMA regulatory maps provide just one perspective on flood risks in Calaveras County. Senate Bill 5 (SB 5), enacted in 2007, authorized the California DWR to develop the Best Available Maps (BAM) displaying 100- and 200-year floodplains for areas located within the Sacramento-San Joaquin (SAC-SJ) Valley watershed. SB 5 requires that these maps contain the best available information on flood hazards and be provided to cities and counties in the SAC-SJ Valley watershed. This effort was completed by DWR in 2008. DWR has expanded the BAM to cover all counties in the State and to include 500-year floodplains.

Different than the FEMA DFIRMs which have been prepared to support the NFIP and reflect only the 100-year event risk, the BAMs are provided for informational purposes and are intended to reflect current 100-, 200-, and 500-year event risks using the best available data. The 100-year floodplain limits on the BAM are a composite of multiple 100-year floodplain mapping sources. It is intended to show all currently identified areas at risk for a 100-year flood event, including FEMA's 100-year floodplains. The BAM are comprised of different engineering studies performed by FEMA, Corps of Engineers, and DWR for assessment of potential 100-, 200-, and 500-year floodplain areas, as well as for flood awareness areas. These studies are used for different planning and/or regulatory applications. They are for the same flood frequency, however, they may use varied analytical and quality control criteria depending on the study type requirements.

The value in the BAMs is that they provide a bigger picture view of potential flood risk to the City than that provided in the FEMA DFIRMs. This provides the community and residents with an additional tool for understanding potential flood hazards not currently mapped as a regulated floodplain. Improved awareness of flood risk can reduce exposure to flooding for new structures and promote increased protection for existing development. Informed land use planning will also assist in identifying levee maintenance needs and levels of protection. By including the FEMA 100-year floodplain, it also supports identification of the need and requirement for flood insurance. With respect to the BAM maps for Calaveras County and the City of Angels Camp, on the FEMA effective and DWR Awareness maps have been identified. The BAM maps for the City are shown in Figure A-6.

Figure A-6 City of Angels Camp Best Available Maps



Source: California Department of Water Resources

Flood: Localized Stormwater Flooding

Likelihood of Future Occurrence—Highly Likely
Vulnerability—Medium

Localized flooding occurs at various times throughout the year and there are several areas of concern unique to the City. Historically, the City has been at risk of flooding primarily during the spring months when the waterway/creek systems swell with heavy rainfall. This may produce local street flooding due to high water in the waterway/creek systems causing outfalls to back-up into the drainage inlets. Localized flooding in the City occurs along Cherokee, Greenhorn, Angels, Sixmile, and Indian Creek. The HMPC noted that, depending on the duration and strength of rain storms, all roads in the City may see effects of localized flooding.

Future Development

Future development in the City will add more impervious surfaces which will drain to existing waterways in the City. The City will need to be proactive to ensure that increased development has proper siting and drainage for stormwaters. The risk of localized flooding to future development will be minimized by accurate recordkeeping of repetitive localized storm activity. Mitigating the root causes of the localized stormwater flooding will reduce future risks of losses.

Severe Weather: Winter Storms and Extreme Cold

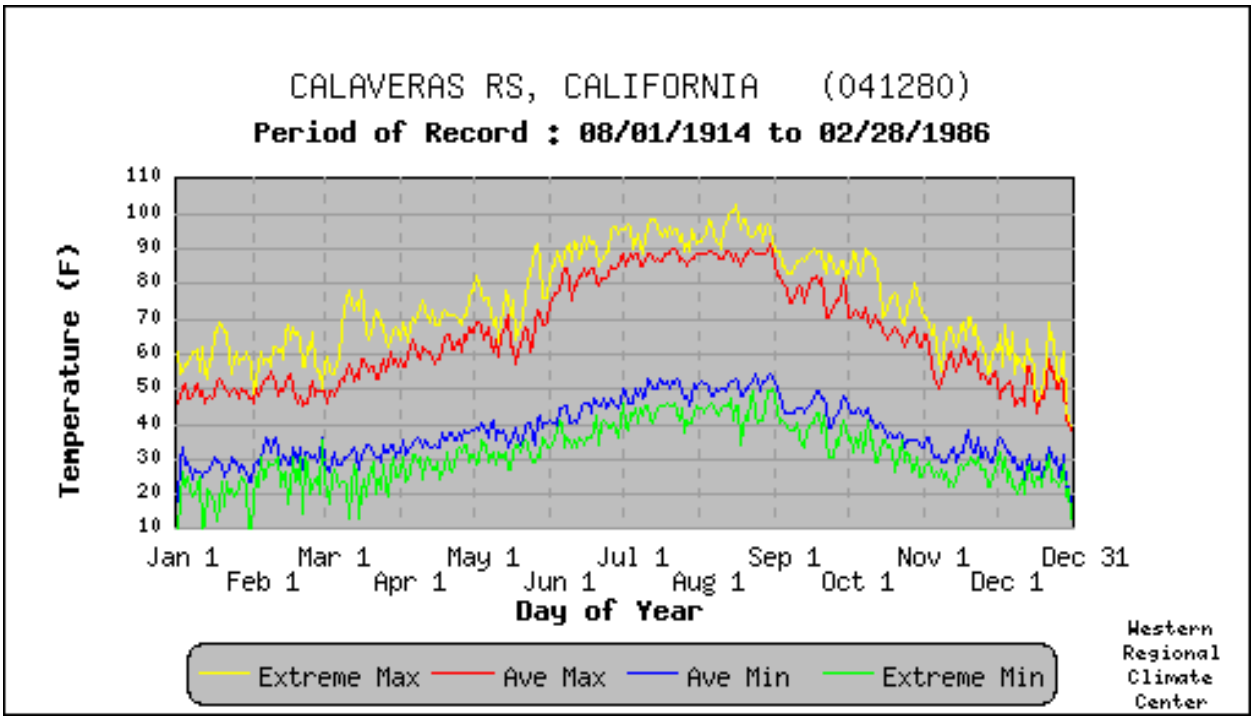
Likelihood of Future Occurrence—Highly Likely
Vulnerability—Medium

The threat to public safety is typically the greatest concern when it comes to impacts of winter storms. But these storms can also impact the local economy by disrupting transportation and commercial activities. Winter storms are rarely severe enough to overwhelm snow removal efforts, transportation, land business and commercial activities. Travelers on highways in the County, particularly along remote stretches of road, can become stranded in the City, requiring search and rescue assistance and shelter provisions.

Structural losses to buildings are possible from severe snow loads on rooftops. Older buildings are more at risk, as are buildings with large flat rooftops (often found in public buildings such as schools). Another common impact of blizzards and severe winter storms on the planning area is the loss of power. The weight of heavy continued snowfall and/or ice accumulating on power lines often brings them to the ground causing service disruptions for thousands of customers. This can cause a loss of community water and sewer services, as well as the supply of gasoline, as these services almost always require electrical pumps. In addition, prolonged power outages can mean loss of food to grocery stores, large facilities that provide feeding services (such as hospitals and nursing homes), and restaurants.

The City experiences temperatures below 32 degrees during the winter months. The temperature moves to the teens in rather extreme situations (see Figure A-7). Many months see a high number of days where daily low temperatures fall below 32°F (see Table A-15). On average, 123.4 days a year see low temperatures below 32°F. Generally, people who live and work in this weather are prepared to cope with these extremes. Daily averages and extremes are shown on Figure A-8.

Figure A-7 City of Angels Camp – Extreme Temperatures



Source: Western Regional Climate Center, Calaveras Ranger Station

Table A-15 Extreme Low Temperatures in Angels Camp

Month	Temperature	Date	Month	Temperature	Date
January	10°	1/1/1915	July	37°	7/26/1916
February	14°	2/21/1920	August	34°	8/18/1916
March	13°	3/11/1917	September	30°	9/23/1920
April	23°	4/30/1919	October	25°	10/30/1919
May	27°	5/27/1919	November	22°	11/11/1915
June	33°	6/01/1916	December	13°	12/31/1915

Source: Western Regional Climate Center, Calaveras Ranger Station

Limited data on freeze impacts in the City was available during the development of this hazard's vulnerability. Areas prone to freezing temperatures are identified normally on a nation-wide assessment scale, which doesn't allow detailed results on specific structures. Secondary impacts of extreme cold can affect the supporting mechanisms or systems of a community's infrastructure. For example, when extreme cold is coupled with high winds or ice storms, power lines may be downed, resulting in an interruption in the transmission of that power shutting down electric furnaces, which may lead to frozen pipes in homes and businesses.

The elderly population in the planning area is most vulnerable to temperature extremes. The residents of elder care facilities are especially vulnerable to extreme temperature events. It is encouraged that such facilities have emergency plans or backup power to address power failure during times of extreme cold.

Future Development

Vulnerability to winter storms and freeze will increase as the average age of the population in the City shifts. Greater numbers of future senior citizens will result from the large number of baby boomers in the City. The elderly are more at risk to the effects of freeze. However, many of the residents of the City are accustomed to living with freeze and take precautions to guard against the threat of freeze. Future development in the City should reduce the risk to frozen pipes, as building codes in the City are well enforced.

Severe Weather: Heavy Rains and Storms

Likelihood of Future Occurrence—Highly Likely
Vulnerability—Medium

According to historical hazard data, severe weather is a regular occurrence in Angels Camp. Damage and disaster declarations related to severe weather have occurred and will continue to occur in the future. Heavy rain and thunderstorms are the most frequent type of severe weather occurrence in the area. Wind and lightning often accompany these storms and have caused damage in the past. Problems associated with the primary effects of severe weather include flooding, pavement deterioration, washouts, high water crossings, landslide/mudslides, debris flows, historic rock wall failures, and downed trees. During times of drought or during storms with limited precipitation, lightning can ignite wildfires as well.

Future Development

The City enforces the state building code and other ordinances, which regulate construction techniques that minimize damage from heavy storms and rain. Future development in the City is subject to these building codes. New critical facilities such as communications towers are required by code to withstand hail damage, lightning, and heavy rains.

Severe Weather: Wind (include tornadoes)

Likelihood of Future Occurrence—Likely
Vulnerability—Medium

High winds are common occurrences in the City throughout the entire year. Straight line winds are primarily a public safety and economic concern. Windstorms can cause damage to structures and power lines which in turn can create hazardous conditions for people. Debris flying from high wind events can shatter windows in structures and vehicles and can harm people that are not adequately sheltered. Tornadoes in the City are rare, but would be devastating if one hit the City.

Losses from straight line winds and tornadoes include:

- Erosion (soil loss)
- Power line impacts and economic losses from power outages
- Occasional building damage, primarily to roofs and out-buildings

Campers, mobile homes, barns, and sheds and their occupants are particularly vulnerable as windstorm events in the region can be sufficient in magnitude to overturn these lighter structures. Livestock that may be contained in these structures may be injured or killed, causing economic harm to the rancher who owns both the structure and the livestock. Overhead power lines are vulnerable and account for the majority of historical damages. State highways can be vulnerable to high winds and dust storms, where high profile vehicles may be overturned by winds and lowered visibility can lead to multi-car accidents.

Future Development

Future development projects should consider windstorm hazards at the planning, engineering and architectural design stage with the goal of reducing vulnerability. The City enforces the state building code and other ordinances, which regulate construction techniques that minimize damage from windstorms. Future development in the City is subject to these building codes.

Wildfire

Likelihood of Future Occurrence—Likely
Vulnerability—Medium

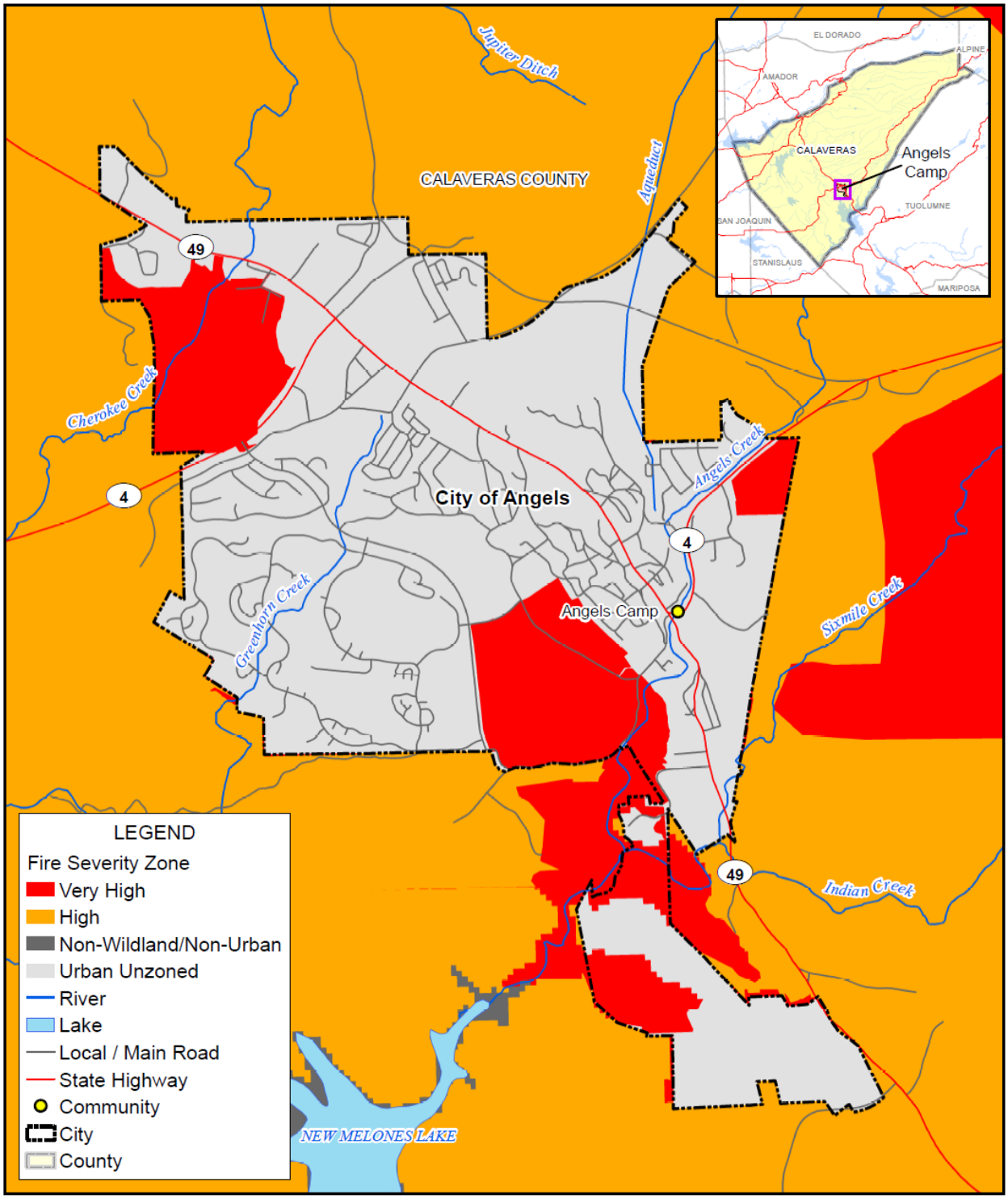
Major fires are generally categorized as either a conflagration or wildland/forestland. A conflagration may involve residential or commercial areas and spreads across both natural and constructed barriers. Wildland is associated with open range grasslands and into the foothills of a particular area. Because of development in areas adjacent to and within Angels Camp, a third classification has emerged, the Wildland Urban Interface wildfire. The urban interface wildfire is one that burns along the urban/rural interface and can result in major losses of property and structures.

A number of factors affect the behavior of wildland and interface fires, including terrain, weather, wind, fuels and seasons. It is well known that fire travels faster uphill than down and is more difficult to fight on steep slopes than on level ground. When weather is hot and the humidity is low, wildland fires can explode with intensity of rapid combustion. Even in the absence of strong winds, a fast-moving fire can generate its own updrafts, particularly in canyons, causing burning brands to be carried high in the air and drop a long distance ahead. This results in spot fires over a wide radius as the wind changes its direction.

Angels Camp is not immune to numerous types of grass and brush fires and any one of them may accelerate into an urban interface wildfire. Such a situation could lead to evacuation of large portions of the population and the potential for significant loss of personal property, structures, and rangeland. The natural fuels available in or near the City vary greatly in the rate and intensity of burning. Fires in heavy brush and stands of trees burn with great intensity but more slowly than in dry grass and leaves. Dense fuels will propagate fire better than sparse fuels. The local fire season generally extends from June through early October.

Figure A-9 shows wildfire risk in Angels Camp. Wildfire threat within the City is very high in limited areas, with most of the City contained within an urban-unzoned area for purposes of wildfire severity zone mapping conducted by CAL FIRE. This mapping followed the methodology detailed in Section 4.3 of the base plan.

Figure A-8 City of Angels Camp Fire Severity Zones



Data Source: CalFire SRA (14_2) 12/2007, LRA 6/2008, FRA/LRA 8/2007 DRAFT, Calaveras County, CAL ATLAS; Map Date: 5/2015.

Assets at Risk

Analysis results for Angels Camp are shown in Table A-16, which summarizes total parcel counts, improved parcel counts and their land and improved values by occupancy type as well as the percentage of parcels affected by each wildfire severity zone.

Table A-16 City of Angels Camp – Count and Value of Parcels by Property Use and Fire Severity Zone

Fire Severity Zone	Property Use	Total Parcel Count	Total Land Value	Improved Parcel Count	Improved Value	Total Value*	% of Affected Parcels to Total
Very High	Agricultural	0	$0	0	$0	$0	0.00%
	Commercial	1	$242,223	1	$289,538	$531,761	0.06%
	Industrial	0	$0	0	$0	$0	0.00%
	Institutional	2	$0	0	$0	$0	0.00%
	Other	6	$45,064	0	$0	$45,064	0.00%
	Residential	47	$1,639,716	47	$5,347,373	$6,987,089	2.94%
	Vacant Land	25	$844,772	0	$0	$844,772	0.00%
	Total	**81**	**$2,771,775**	**48**	**$5,636,911**	**$8,408,686**	**3.00%**
High	Agricultural	0	$0	0	$0	$0	0.00%
	Commercial	0	$0	0	$0	$0	0.00%
	Industrial	0	$0	0	$0	$0	0.00%
	Institutional	0	$0	0	$0	$0	0.00%
	Other	0	$0	0	$0	$0	0.00%
	Residential	0	$0	0	$0	$0	0.00%
	Vacant Land	0	$0	0	$0	$0	0.00%
	Total	**0**	**$0**	**0**	**$0**	**$0**	**0.00%**
Moderate	Agricultural	0	$0	0	$0	$0	0.00%
	Commercial	0	$0	0	$0	$0	0.00%
	Industrial	0	$0	0	$0	$0	0.00%
	Institutional	0	$0	0	$0	$0	0.00%
	Other	0	$0	0	$0	$0	0.00%
	Residential	0	$0	0	$0	$0	0.00%
	Vacant Land	0	$0	0	$0	$0	0.00%
	Total	**0**	**$0**	**0**	**$0**	**$0**	**0.00%**
	Agricultural	0	$0	0	$0	$0	0.00%

Fire Severity Zone	Property Use	Total Parcel Count	Total Land Value	Improved Parcel Count	Improved Value	Total Value*	% of Affected Parcels to Total
Non-Wildland/Non-Urban	Commercial	0	$0	0	$0	$0	0.00%
	Industrial	0	$0	0	$0	$0	0.00%
	Institutional	0	$0	0	$0	$0	0.00%
	Other	0	$0	0	$0	$0	0.00%
	Residential	0	$0	0	$0	$0	0.00%
	Vacant Land	0	$0	0	$0	$0	0.00%
	Total	**0**	**$0**	**0**	**$0**	**$0**	**0.00%**
Urban Unzoned	Agricultural	7	$24,911	2	$52,255	$77,166	0.13%
	Commercial	134	$13,493,255	118	$42,980,356	$56,473,611	7.38%
	Industrial	5	$338,412	4	$788,174	$1,126,586	0.25%
	Institutional	46	$2,329,733	15	$15,338,831	$17,668,564	0.94%
	Other	115	$850,444	9	$707,220	$1,557,664	0.56%
	Residential	1,432	$70,331,856	1,398	$260,678,803	$331,010,659	87.43%
	Vacant Land	412	$23,488,016	5	$1,196,049	$24,684,065	0.31%
	Total	**2,151**	**$110,856,627**	**1,551**	**$321,741,688**	**$432,598,315**	**97.00%**
Grand Total		**2,232**	**$113,628,402**	**1,599**	**$327,378,599**	**$441,007,001**	**100.00%**

Source: Calaveras County Assessor's 2014 Data; CAL FIRE
*Land and structure values

Population at Risk

The Fire Severity Zone dataset was overlayed on the parcel layer. Those residential parcel centroids that intersect the severity zones were counted and multiplied by the 2010 Census Bureau average household factors for each jurisdiction and unincorporated area. Results were tabulated by jurisdiction. According to this analysis, there is a total population of 108 residents of Angels Camp living within a very high fire severity zone. The remaining 3,215 residents are located within the urban-unzoned area based on these CAL FIRE maps. While the majority of residents are not located specifically within a mapped, high risk area, all residents of Angels Camp are at some risk to a devastating wildfire. This is shown in Table A-17.

Table A-17 City of Angels Camp – Count of Improved Residential Parcels and Population by Fire Severity Zone

Fire Severity Zone	Improved Residential Parcels	Population*
Very High	47	108
High	0	0
Moderate	0	0

Fire Severity Zone	Improved Residential Parcels	Population*
Non-Wildland/Non-Urban	0	0
Urban-Unzoned	1,398	3,215
Total	**1,434**	**3,323**

Source: Calaveras County 2014 Assessor's Data; CAL FIRE

* Average household populations for Angels Camp (2.30) from the 2010 US Census were used

Critical Facilities at Risk

A separate analysis was performed on the critical facility inventory in Calaveras County and Angels Camp. GIS was used to determine whether the facility locations intersects a fire severity zone, and if so, which zone it intersects Details of critical facilities at risk to wildfire in the City of Angels Camp are shown in Figure A-5 and Table A-14. As shown on the table and figure, Angels Camp has no critical facilities located in the very high fire severity zones; all 26 mapped critical facilities within the City are contained within the urban-unzoned wildfire severity zone. Details of critical facility definition, type, name and address and jurisdiction by wildfire severity zone are listed in Appendix F.

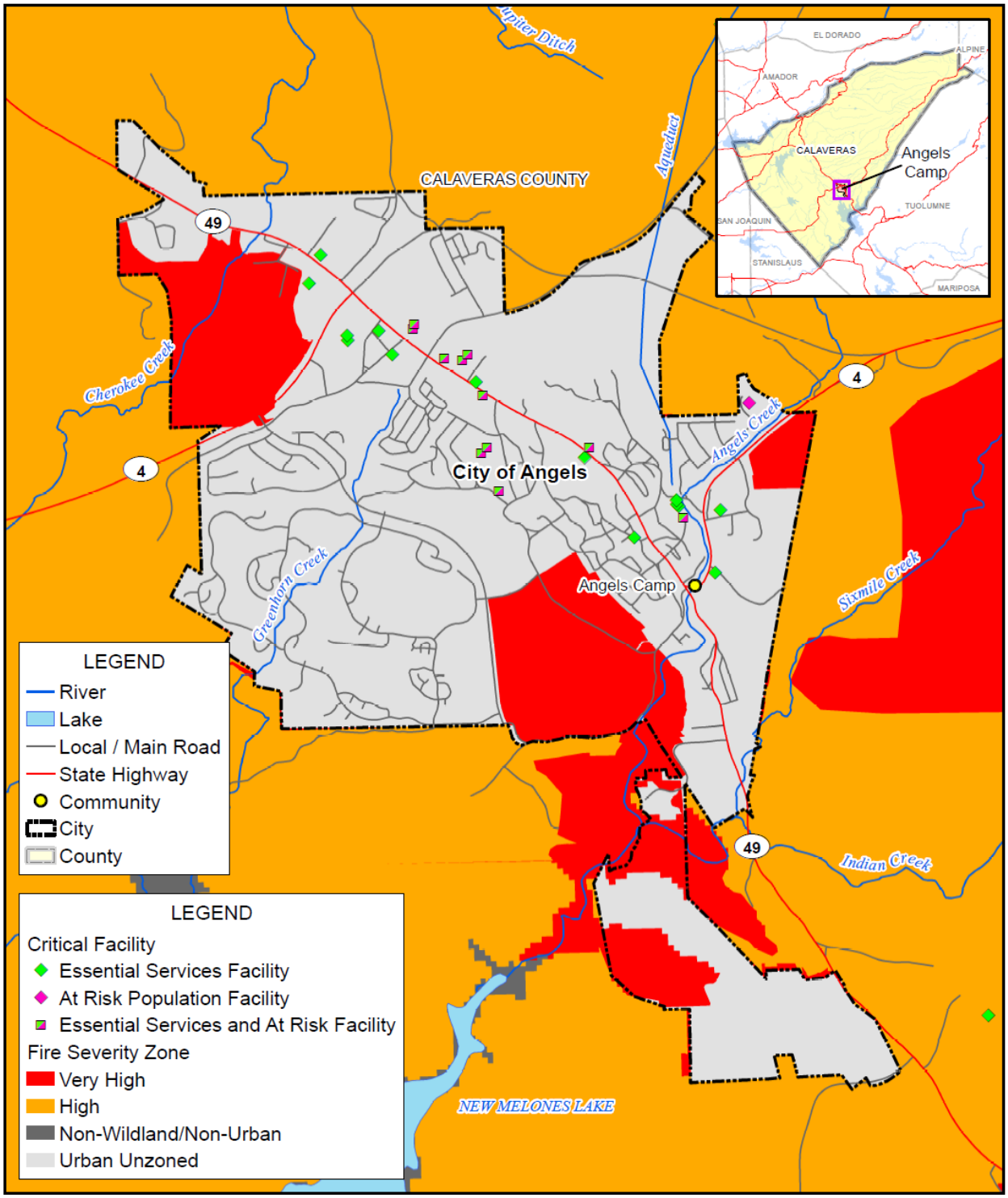
Table A-18 City of Angels Camp Critical Facilities by Fire Severity Zones

Fire	Category	Type	Facility Count
Very High	Essential Services Facilities	–	0
	At Risk Population Facilities	–	0
	Essential Services Facilities and At Risk Population Facilities	–	0
	Hazardous Materials Facilities	–	0
	Total Very High		**0**
High	Essential Services Facilities	–	0
	At Risk Population Facilities	–	0
	Essential Services Facilities and At Risk Population Facilities	–	0
	Hazardous Materials Facilities	–	0
	Total High		**0**
Moderate	Essential Services Facilities	–	0
	At Risk Population Facilities	–	0
	Essential Services Facilities and At Risk Population Facilities	–	0
	Hazardous Materials Facilities	–	0
	Total Moderate		**0**
	Essential Services Facilities	–	0

Fire	Category	Type	Facility Count
Non-Wildland/Non-Urban	At Risk Population Facilities	–	0
	Essential Services Facilities and At Risk Population Facilities	–	0
	Hazardous Materials Facilities	–	0
	Total Non-Wildland/Non-Urban		**0**
Urban Unzoned	Essential Services Facilities	Community Food Bank / Pantry	4
		Emergency Medical	1
		Fire Station	4
		Government Operations	1
		Medical Health Facility	2
		Power Utility	1
		Police	1
	At Risk Population Facilities	Congregate Care Facility	1
	Essential Services Facilities and At Risk Population Facilities	School / Emergency Shelter	11
	Hazardous Materials Facilities		0
	Total Urban Unzoned		**26**
Total Fire - City of Angels Camp			**26**

Source: Calaveras County GIS, CAL FIRE

Figure A-9 City of Angels Camp Critical Facilities by Fire Severity Zone



Foster Morrison

0 1 2 Miles

N

Data Source: CalFire SRA (14_2) 12/2007, LRA 6/2008, FRA/LRA 8/2007 DRAFT, Calaveras County, CAL ATLAS; Map Date: 9/2015.

Future Development

There is currently no development planned in the very high fire severity zones in the City.

A.6 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capability assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation outreach and partnerships, and other mitigation efforts.

A.6.1. Planning and Regulatory Mitigation Capabilities

Table A-19 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the City of Angels Camp.

Table A-19 City of Angels Camp Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan	Y 2009	The plan addresses hazards in the following elements: Conservation, Public Safety, and Public Facilities and Services. The General Plan identifies goals and policies that are included in the mitigation strategy. The General Plan is used to implement the mitigation actions through the mitigation related policies set forth in the document.
Capital Improvements Plan	Y	The City has adopted a Water and Sewer Master Plan Water in 2011, Sewer in 2013
Economic Development Plan	N	
Local Emergency Operations Plan	Y 2015 (Draft)	The EOP addresses the following hazards: earthquakes, floods, dam failure, wildland fires, landslides, extreme weather emergencies, haz-mat, and other man-mad hazards. The EOP addresses mitigation strategies and can be used to implement mitigation actions.
Continuity of Operations Plan	N	
Transportation Plan	Y	The City adopted the Calaveras Council of Governments Regional Transportation Plan (RTP) as well as the City of Angels Traffic Mitigation Study. The RTP was adopted in 2012 and the Mitigation Study in 2010.
Stormwater Management Plan/Program	Y	While there is not a specific Stormwater Plan, there is a stormwater program within the City that addresses stormwater runoff, flooding and water quality issues.
Engineering Studies for Streams	Y 2010	The FIS addresses hazards specific to the City. It does not include projects or actions.

Community Wildfire Protection Plan	Y 2011	The plan addresses fire specifically. There are mitigation related projects identified in the plan.
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)	Y	There are multiple plans that identify hazard, contain mitigation strategies, and are used by the County and City to implement actions. The Calaveras County Terrorism Plan, Area Plan, Water Master Plan, Urban Water Management Plan, and TCU Fire Management Plan are examples of such planning mechanisms that the County and City partner on.
Building Code, Permitting, and Inspections	**Y/N**	**Are codes adequately enforced?**
Building Code	Y	Version/Year: 2013 California Building Code
Building Code Effectiveness Grading Schedule (BCEGS) Score		Score:
Fire department ISO rating:	Y	Rating: 4
Site plan review requirements	Y	Site inspection review by Public Works, Planning, Fire
Land Use Planning and Ordinances	**Y/N**	**Is the ordinance an effective measure for reducing hazard impacts?** **Is the ordinance adequately administered and enforced?**
Zoning ordinance	Y	The ordinance is effective in reducing hazard impacts. The zoning ordinance is administered and enforced.
Subdivision ordinance	Y	The ordinance is effective in reducing hazard impacts. The subdivision ordinance is administered and enforced.
Floodplain ordinance	Y	The ordinance is effective in reducing hazard impacts. The floodplain ordinance is administered and enforced. It is located in Title 15, Chapter 20 of the municipal code for Angels Camp.
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	N	
Flood insurance rate maps	Y	The 2010 DFIRMs are effective. The rate maps are administered and enforced.
Elevation Certificates	N	
Acquisition of land for open space and public recreation uses	N	
Erosion or sediment control program	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		

Outlined below are existing, adopted planning documents with provisions specifically relating to hazard mitigation, public safety and loss reduction.

City of Angels Camp 2020 General Plan

California Law requires that every City and County in the state have a General Plan. The City of Angels Camp 2020 General Plan, adopted in 2009, was prepared over a five-year period that included an extensive

public review process. The General Plan is the most important policy and planning document in the City, and is used by virtually every department. The General Plan is the City's statement of its vision for the future. The General Plan contains policies covering every aspect of the City: land use (how land can be developed), circulation, noise, air quality, housing, open space and conservation, and health and safety.

Goals and policies related to mitigation of natural hazards are as follows:

Goal/Policy/ Program	Explanation
Conservation Element	
Policy 4.C.f	Prepare a Grading Ordinance/Promote Best Management Practices to Reduce Erosion
Goal 4.H	**Protect the health and safety of people and property in the city from natural and man-made hazards.**
Policy 4.H.1	Protect the health and safety of people and property in the city from natural hazards to the extent feasible.
Policy 4.H.2	Protect the health and safety of people and property in the city from manmade hazards to the extent feasible.
Policy 4.H.3	Protect sensitive land uses from encroachment by incompatible land uses.
Policy 4.H.4	Increase citizen awareness of potential health and safety hazards in the city to the extent feasible.
Program 4.H.a	Designate flood hazard areas, as identified by the Federal Emergency Management Agency or as refined through local studies, as Resource Management ("RM" general plan) and Open Space ("OS" zoning).
Program 4.H.b	Coordinate with appropriate local, state and/or federal agencies to ensure the removal of debris adjacent to bridges within the city limits that may result in damage and/or destruction of bridges, or damming at bridges, during flood events, thereby limiting emergency access into and out of the city. Update the city's emergency response plan to address the emergency response priority associated with maintenance of the State Route 49 Bridge over Angels Creek.
Program 4.H.g	Identify funding sources and qualified agencies to prepare detailed flood zone maps establishing flood elevations throughout the city. Consider approaching the Resource Conservation & Development District to assist in preparing the maps.
Public Safety	
Goal 6.A	**Protect persons and property from geologic hazards**
Policy 6.A.1	Assess and keep appraised of the potential risks to persons and property from geological hazards within, or with the potential to affect the city.
Policy 6.A.2	Reduce exposure to risks in hazardous areas by directing development away from these areas.
Policy 6.A.3	Provide guidance to citizens regarding preparing for and responding to emergencies related to earthquakes, volcanic eruptions and other geological hazards that may affect the city.
Policy 6.A.4	Make emergency preparedness a city priority and keep the city's emergency response plan updated.
Program 6.A.a	Prepare an Emergency Operations Plan and Local Hazard Mitigation Plan for the City
Program 6.A.b	Continue to Participate in the Preparation and Implementation of the County/City Hazard Management Plan
Program6.A.c	Investigate the Cost of Requiring New Development to Map Potential Underground Hazards
Program 6.A.d	Acquire Maps of Areas Posing a Potential Hazard From Mine or Tunnel Collapse
Program 6.A.e	Require New Development to Evaluate Geotechnical Hazards

Goal/Policy/ Program	Explanation
Program 6.A.f	Require Geotechnical Hazard Evaluations for Critical Use and High Occupancy Structures
Program 6.A.g	Continue to Enforce the Provisions of the Uniform Building Code
Program 6.A.h	Encourage Rehabilitation of Old Buildings
Program 6.A.i	Designate Identified Hazard Areas Through Appropriate Zoning Where Feasible
Program 6.A.j	Draft a Hillside Management Ordinance
Program 6.A.k	Require Engineering Studies for Development in Unstable Areas, Soil Testing for Expansive Soils
Program 6.A.l	Prepare a Grading Ordinance/Promote Best Management Practices
Program 6.A.m	Establish Standards for Erosion and Dust Control
Program 6.A.n	Keep Appraised of New Seismic Information
Program 6.A.o	Provide Emergency Response/Preparation Guidelines for Citizens on The Angels Camp City Website
Goal 6.B	**Protect persons and property from flooding and inundation from dam failures.**
Policy 6.B.1	Make emergency preparedness a city priority.
Policy 6.B.2	Keep the city's emergency response plan updated to reflect the most current information available regarding the potential risks to persons and property from flooding and inundation from dam failures within the city.
Policy 6.B.3	Provide guidance to citizens for preparing for and responding to floods and inundation from dam failures affecting the city.
Policy 6.B.4	Evaluate and minimize potential impacts of new development on drainage facilities and downstream property.
Program 6.B.c	Facilitate Assessment of Hazards Associated with Dam Failures Affecting Angels Camp
Program 6.B.d	Consider Preparation of a Flood Damage Prevention Ordinance
Program 6.B.e	Continue to Maintain and Upgrade Storm Drainage Facilities
Program 6.B.f	Mitigate Impacts on Downstream Drainage Facilities and Property
Program 6.B.g	Designate Resource Management & Open Space Setbacks Along Creeks
Program 6.B.h	Coordinate With the County to Address the Impacts of Development Within the Watersheds of Drainages Flowing Through the City
Program 6.B.i	Pursue Funding for Preparation of a Hydrological Study
Program 6.B.j	Coordinate with Appropriate Agencies and Private Landowners to Ensure Debris Removal in Streams to Reduce the Potential for Damage of Downstream Facilities (e.g., Bridges)
Program 6.B.k	Design New Bridges (Pedestrian and Automobile) to Minimize Damage From Major Flood Events
Program 6.B.l	Provide Emergency Response/Preparation Guidelines for Citizens on The Angels Camp City Website
Program 6.B.m	Pursue Preparation of Detailed Flood Zone Maps
Program 6.B.n	Protect New Development from Flood Hazards
Goal 6.C	**Undertake adequate preparation for and ensure an adequate response to emergency and disaster situations affecting the city.**
Policy 6.C.1	Prepare city staff, to the maximum extent feasible given available funding levels, to respond quickly and adequately to emergency and disaster situations affecting the city.

Goal/Policy/ Program	Explanation
Policy 6.C.2	Provide guidance to citizens regarding preparing for and responding to emergencies to supplement and ensure the smooth implementation of the city's emergency operations plan.
Policy 6.C.3	Support the formation of self-help/citizen response teams to aid city agencies in providing emergency response services to a large segment of the city's population.
Policy 6.C.4	Make emergency preparedness a city priority and keep the city's emergency response plan updated.
Program 6.C.c	Adopt an Emergency Operations Plan Enabling Ordinance
Program 6.C.d	Sponsor Emergency Training for City Personnel
Program 6.C.e	Conduct Emergency Training Exercises
Program 6.C.f	Continue to Maintain a City Safety Committee
Program 6.C.h	Pursue the Provision of Paramedic Services for the City
Program 6.C.i	Encourage City Residents to Receive Training as Part of Citizen Emergency Response Teams
Goal 6.D	**Protect people and property from risks associated with the use, transport, treatment and disposal of hazardous materials and wastes.**
Policy 6.D.1	Encourage citizen opportunities for recycling and disposal of household hazardous materials and wastes.
Policy 6.D.2	Continue to work cooperatively with other jurisdictions to manage the use, transport, treatment and disposal of hazardous materials.
Policy 6.D.3	Make emergency preparedness a city priority and keep the city's emergency response plan updated
Goal 6.E	**Facilitate the provision of an adequate supply of water, and essential utilities and communications for city residents during emergency situations.**
Policy 6.E.1	Provide the necessary tools to reduce the impacts of disruptions in water and other essential utilities and communications during emergency situations.
Policy 6.E.2	Proactively plan for emergency response during situations affecting the city water supply and essential services and communications.
Policy 6.E.3	Coordinate with public utility agencies in the preparation of emergency operations plans.
Policy 6.E.4	Make emergency preparedness a city priority and keep the city's emergency response plan updated.
Program 6.E.d	Support the Efforts of the Local HAM Radio Club/Radio Amateur Civil Emergency Services (RACES)
Program 6.E.e	Support the Efforts of KVML and Local Access Television to Provide Emergency Updates to Citizens
Program 6.E.f	Increase Water Storage Capacity
Program 6.E.g	Maintain Information Pertaining to Water Resources in Mines, Underground Rivers and High-Production Wells
Program 6.E.h	Maintain Information Pertaining to the Use of Untreated or Semi-Treated Water During Emergency Situations
Public Facilities and Services	
Goal 7.B	**Continue to improve Angels Camp's capacity to store, treat and deliver water and to collect and treat wastewater as necessary to achieve the stated goals of the city.**
Program 7.B.k	Increase Water Storage Capacity
Goal 7C	**Maintain or increase the standards of coverage currently available within Angels Camp for fire protection and medical response facilities and infrastructure.**

Goal/Policy/ Program	Explanation
Policy 7.C.4	Monitor the condition of and plan for future fire protection and medical response facility needs.
Policy 7.C.5	Continue to recognize the need for and support fire prevention and education activities to promote community health and safety.
Policy 7.C.6	Continue to support and encourage coordination between organizations and agencies to optimize limited resources assisting in the provision of adequate fire protection and medical response services.
Policy 7.C.7	Recognize the need to coordinate planning for infrastructure improvements (e.g., circulation improvements) to achieve the city's health and safety goals.
Program 7.C.d	Continue to Mitigate Impacts to City Fire and Medical Protection Resources
Program 7.C.e	Make Available Fire Protection Standards
Program 7.C.f	Continue to Maintain and Expand Fire Prevention Inspection Activities
Program 7.C.h	Continue to Provide Fire Prevention and Safety Education
Program 7.C.i	Continue to Implement the Citywide Weed Abatement Program
Program 7.C.n	Prepare a Community Wildfire Protection Plan
Program 7.C.o	Update Chapter 15.24 of the Angels Camp Municipal Code (Fire Prevention), Including Very High Fire Hazard Severity Zone Map (VHFHSZ) Vegetation Management Plans, Guidelines for New Development in Urban/Wildland Interface Areas, Public Resources Code 4291
Goal 7H	**Maintain or increase the levels of service currently available within Angels Camp for public works facilities and infrastructure including roads, sidewalks, drainage facilities, public buildings, and other public facilities.**
Program 7.H.b	Continue to Maintain and Upgrade Storm Drainage Facilities
Program 7.H.c	Mitigate Impacts on Downstream Drainage Facilities and Property
Program 7.H.d	Coordinate with the County to Address the Impacts of Development Increasing Runoff, Flood Hazards or Affecting the City's Storm Drain System within the Watersheds of Drainages Flowing through the City
Program 7.H.i	Pursue Fair Share Participation and Contributions to Finance and Maintain Adequate Stormwater Runoff Infrastructure and Capacity

Source: Angels Camp 2020 General Plan

The City of Angels Camp has many ordinances related to mitigation. These are discussed below.

Civil Defense and Disaster Organization (Title 2, Chapter 12)

The declared purposes of this chapter are to provide for the preparation and carrying out of plans for the protection of persons and property within this city in the event of a disaster, and to provide for the coordination of the civil defense and disaster functions of the city with all other public agencies and affected private persons, corporations and organizations. As used in this chapter:

- "Civil defense" means preparation for and carrying out of all emergency functions, other than functions for which military forces are primarily responsible, to prevent, minimize and repair injury and damage resulting from disasters. It shall not include, nor does any provision of this chapter apply to any condition relating to a labor controversy.
- "Disaster" means actual or threatened enemy attack sabotage, extraordinary fire, flood, storm, epidemic, riot, earthquake or other similar public calamity.

It shall be the duty of the city civil defense and disaster council, and it is hereby empowered, to review and recommend for adoption by the city council, civil defense and disaster and mutual aid plans and agreements and such ordinances and resolutions and rules and regulations as are necessary to implement such plans and agreements.

Zoning (Title 17)

The City of Angels Camp Zoning Code is the primary implementing mechanism of the General Plan. Unlike the General Plan, which provides long-range, comprehensive general policies for the general direction of land use in the City, the Zoning Code provides more specific descriptions of the types of uses that are allowed in certain areas, development standards (e.g., setbacks, building heights, lot coverage) and other detailed guidance for property development. The Zoning Code is required to be consistent with the General Plan.

The city council is authorized by the Planning and Zoning Laws of the California State Government Code, Title 7, Planning and Land Use, Division 1, Planning and Zoning, Chapter 4, Zoning Regulations, to regulate the following:

- Use of land and buildings;
- Height, bulk and size of buildings and structures;
- Construction and use of signs and billboards;
- Intensity of land use;
- Establishment and maintenance of building setback lines.

This includes the regulation of development in the floodplain, as discussed in the flood ordinance below.

This zoning plan is adopted to:

- Provide a means to achieve the goals, objectives, policies and standards of the general plan; and to provide a guide for the growth and development of the city;
- Encourage, classify, designate, regulate and segregate the uses of land, buildings and structures to serve the needs of commerce, industry, residences and other appropriate land uses;
- Establish conditions which will allow all the land uses within the city to coexist in harmony;
- Assure adequate site development standards;
- Provide a means of obtaining adequate provisions for community utilities such as transportation, water supply, sewage disposal, schools, parks and other public requirements. (Ord. 270 (part), 1984)

Subdivision (Title 16)

The ordinance codified in this title is enacted to facilitate the orderly development of lands in the incorporated area of the City.

- This title shall implement the objectives established for the development of the city in conformance with its general plan, and the streets and highways plan. A proposed subdivision or land division shall be considered in relation to such plan.
- This title shall provide standards governing the subdividing of lands, surveys therefor, and the submission of maps and the requirements for and improvement of subdivided lands.

- This title shall provide for a resolution governing standards for health and sanitation requirements, and the construction and installation of streets, highways, public utilities and other improvements. The resolution shall provide fee schedules for services rendered by the city.
- This title shall provide for the creation of reasonable building sites by establishing adequate street widths, proper alignment of streets, adequate lot sizes, and means of ingress and egress to and from property.
- This title shall control the division of land which is subject to inundation by flooding from natural streams or artificial ponding caused by man, and other detrimental influences which may cause land to be unsuitable for satisfactory development.
- This title shall control the division of land which may be subject to dangerous or unsuitable soil conditions of any type, or subject to any other impediments affecting the use of the land for human habitation.
- This chapter shall provide rules and regulations governing the contents of tentative maps, final subdivision maps, and parcel maps; it shall establish methods for the processing and filing of the maps and regulate other related matters.

Building Regulation Section (Title 15)

In order to provide minimum standards for the proper regulations of building construction, the following publications are hereby adopted by reference and incorporated in this Code, except as expressly amended or superseded by the provisions of this Code.

- 2013 California Building Code, Title 24, Part 2;
- 2013 California Residential Code, Title 24, Part 2.5;
- 2013 California Electrical Code, Title 24, Part 3;
- 2013 California Mechanical Code, Title 24, Part 4;
- 2013 California Plumbing Code, Title 24, Part 5;
- 2013 California Energy Code, Title 24, Part 6;
- 2013 California Historical Code, Title 24, Part 8;
- 2013 California Fire Code, Title 24, Part 9;
- 2013 California Existing Building Code, Title 24, Part 10;
- 2013 California Green Building Standards Code, Title 24, Part 11.

Flood Ordinance (Title 15, Chapter 20)

The flood hazard areas of the City of Angels are subject to periodic inundation which results in loss of life and property, health and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures for flood protection and relief, and impairment of the tax base, all of which adversely affect the public health, safety and general welfare.

These flood losses are caused by the cumulative effect of obstructions in areas of special flood hazards which increase flood heights and velocities, and when inadequately anchored, damage uses in other areas. Uses that are inadequately flood proofed, elevated or otherwise protected from flood damage also contribute to the flood loss.

It is the purpose of this chapter to promote the public health, safety and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed:

- To protect human life and health;

- To minimize expenditure of public money for costly flood control projects;
- To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
- To minimize prolonged business interruptions;
- To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets and bridges located in areas of special flood hazard;
- To help maintain a stable tax base by providing for the second use and development of areas of special flood hazard so as to minimize future flood blight areas;
- To insure that potential buyers are notified that property is in an area of special flood hazard; and
- To insure that those who occupy the areas of special flood hazard assume responsibility for their action. (Ord. 346 §1.3, 1996)

In order to accomplish its purposes, this chapter includes methods and provisions for:

- Restricting or prohibiting uses which are dangerous to health, safety and property due to water or erosion hazards, or which result in damaging increases in erosion or flood heights or velocities;
- Requiring that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;
- Controlling the alteration of natural floodplains, stream channels, and natural protective barriers, which help accommodate or channel flood waters;
- Controlling filling, grading, dredging and other development which may increase flood damage; and
- Preventing or regulating the construction of flood barriers which will unnaturally divert flood waters or which may increase flood hazards in other areas.

This chapter shall apply to all areas of special flood hazards, areas of flood-related erosion hazards and areas of mudslide (i.e., mudflow) hazards within the jurisdiction of the city of Angels.

No structure or land shall hereafter be constructed, located, extended, converted or altered without full compliance with the terms of this chapter and other applicable regulations. Violations of the provisions of this chapter by failure to comply with any of its requirements (including violations of conditions and safeguards established in connection with conditions) shall constitute a misdemeanor. Nothing herein shall prevent the city council from taking such lawful action as is necessary to prevent or remedy any violation.

A development permit shall be obtained before construction or development begins within any area of special flood hazards, areas of flood-related erosion hazards or areas of mudslide (i.e., mudflow) established in Section 15.20.070. Application for a development permit shall be made on forms -furnished by the floodplain administrator and may include, but not be limited to: plans in duplicate drawn to scale showing the nature, location, dimensions and elevation of the area in question; existing or proposed structures, fill, storage of materials, drainage facilities; and the location of the foregoing. Specifically, the following information is required:

- Proposed elevation in relation to mean sea level, of the lowest floor (including basement) of all structures; in zone AO or VO, elevation of highest adjacent grade and proposed elevation of lowest floor of all structures;
- Proposed elevation in relation to mean sea level to which any structure will be floodproofed;
- All appropriate certifications listed in Section 15.20.150(D); and
- Description of the extent to which any watercourse will be altered or relocated as a result of proposed development.

In all areas of special flood hazards the following standards are required:

- Anchoring.
  - ✓ All new construction and substantial improvements shall be anchored to prevent flotation, collapse or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy.
  - ✓ All manufactured homes shall meet the anchoring standards of Section 15.20.190.

- Construction Materials-and Methods.
  - ✓ All new construction and substantial improvements shall be constructed with materials and utility equipment resistant to flood damage.
  - ✓ All new construction and substantial improvements shall be constructed using methods and practices that minimize flood damage.

  - ✓ All new construction and substantial improvements shall be constructed with electrical, heating, ventilation, plumbing and air conditioning equipment and other service facilities that are designed and/or accumulating within the components during conditions of flooding.

- Elevation and Floodproofing.
  - ✓ New construction and substantial improvement of any structure shall have the lowest floor, including basement, elevated to or above the base flood elevation. Nonresidential structures may meet the standards in Section 15.20.160(C)(3). Upon the completion of the structure the elevation of the lowest floor including basement shall be certified by a registered professional engineer or surveyor, or verified by the community building inspector to be properly elevated. Such certification or verification shall be provided to the floodplain administrator.
  - ✓ Nonresidential construction shall either be elevated in conformance with Section 15.20.160(C)(1) or (C)(2) or together with attendant utility and sanitary facilities:
    - Be floodproofed so that below the base flood level the structure is watertight with walls substantially impermeable to the passage of water;
    - Have structural components capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy; and
    - Be certified by a registered professional engineer or architect that the standards of this subsection are satisfied. Such certifications shall be provided to the floodplain administrator.

  - ✓ Require, for all new construction and substantial improvements, that fully enclosed areas below the lowest floor that are subject to flooding shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of flood waters. Designs for meeting this requirement must either be certified by a registered professional engineer or architect or meet or exceed the following minimum criteria:
    - Either a minimum of two openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding shall be provided. The bottom of all openings shall be no higher than one foot above grade. Openings may be equipped with screens, louvers, valves or other coverings or devices; provided, that they permit the automatic entry and exit of flood waters; or

- Be certified to comply with a local floodproofing standard approved by the Federal Insurance Administration.

✓ Manufactured homes shall also meet the standards in Section 15.20.19.

Standards for utilities.

- All new and replacement water supply and sanitary sewage systems shall be designed to minimize or eliminate infiltration of flood waters into the system and discharge from systems into flood waters.
- On-site waste disposal systems shall be located to avoid impairment to them or contamination from them during flooding.

Standards for subdivisions.

- All preliminary subdivision proposals shall identify the flood hazard area and the elevation of the base flood.
- All final subdivision plans will provide the elevation of proposed structure(s) and pads. If the site is filled above the base flood, the final pad elevation will be certified by a registered professional engineer or surveyor and provided to the floodplain administrator.
- All subdivision proposals shall be consistent with the need to minimize flood damage.
- All subdivision proposals shall have public utilities and facilities such as sewer, gas, electrical and water systems located and constructed to minimize flood damage.
- All subdivisions shall provide adequate drainage to reduce exposure to flood hazards.

Standards for manufactured homes.

- All new and replacement manufactured homes and additions to manufactured homes shall:
  - ✓ Be elevated so that the lowest floor is at or above the base flood elevation; and
  - ✓ Be securely anchored to a permanent foundation system to resist flotation, collapse or lateral movement.

Floodways.

- Located within areas of special flood hazard established in Section 15.20.070 are areas designated as floodways. Since the floodway is an extremely hazardous area due to the velocity of flood waters which carry debris, potential projectiles, and erosion potential, the following provisions apply:
  - ✓ Prohibit encroachments, including fill, new construction, substantial improvements, and other development unless certification by a registered professional engineer or architect is provided demonstrating that encroachments shall not result in any increase in flood level during the occurrence of the base flood discharge.
  - ✓ If Section 15.20.200(A) is satisfied, all new -construction and substantial improvement shall comply with all other applicable flood hazard reduction provisions of Article V.

Abatement of Weeds and Rubbish (Title 8, Chapter 10)

The purpose of this chapter is to provide for immediate action to begin abating fire hazards within the city.

- Whenever any condition exists upon the streets, sidewalks, parkways or private property within the city which is defined as a nuisance pursuant to Section 8.10.020, or whenever weeds on specified parcels

of property are seasonal and recurrent nuisances, the enforcement officer may declare the same to be a public nuisance.

- Notice of Nuisance. The enforcement officer shall give written notice to the owner of record to abate the nuisance within fifteen days. The notice of nuisance shall state that the property owner is required to abate the nuisance, shall state the nature of the nuisance to be abated, what is required to abate it, and that if the nuisance is not abated the code enforcement officer shall issue a citation and levy a fine in the sum of two hundred dollars.
- Notice of Abatement Proceedings. If the nuisance has not been abated by the owner within fifteen days after service of the notice of nuisance, the enforcement officer is ordered to take appropriate remedial actions. The enforcement officer shall notify the owner of affected properties, as shown on the latest equalized tax assessment roll, by mail, of intention to abate the nuisance.
- Service of Notice. Notice shall be mailed by certified mail to the address of the property owner not less than fifteen days prior to the date of the proposed abatement. Failure of any owner, or any party concerned, to receive a notice shall not affect the validity of any proceeding taken, if the procedure for service of notice has been followed.

Mining and Reclamation (Title 8, Chapter 36)

This chapter is adopted pursuant to the California Surface Mining and Reclamation Act of 1975, Chapter 9, Public Resources Code. The council finds and declares that the extraction of minerals is essential to the continued economic well-being of the city and to the needs of the society, and that the reclamation of mined lands is necessary to prevent or minimize adverse effects on the environment and to protect the public health and safety. The council further finds that the reclamation of mined lands as provided in this chapter will permit the continued mining of minerals and will provide for the protection and subsequent beneficial use of the mined and reclaimed land. The council further finds that surface mining takes place in diverse areas where the geologic, topographic, climatic, biological and social conditions are significantly different and that reclamation operations and the specifications therefore may vary accordingly.

Any person, except as provided in Section 2776, California Surface Mining and Reclamation Act of 1975, who proposes to engage in surface mining operations as defined in this chapter shall, prior to the commencement of such operations, obtain (1) a permit to mine, and (2) approval of a reclamation plan, in accordance with the provisions set forth in this chapter and as further provided in Article 5, California Surface Mining and Reclamation Act of 1975. A fee, as established by resolution, for the permitted uses shall be paid to the city at the time of filing. All applications for a reclamation plan for surface mining operations shall be made on forms provided by the city clerk's office and as called for by Section 2772 of California Surface Mining and Reclamation Act of 1975. The State Geologist shall be notified of the filing of all permit applications. This chapter shall be reviewed and revised, as necessary, in order to ensure that it is in accordance with the state policy for mined lands reclamation.

Reclamation plans, reports, applications and other documents submitted pursuant to this chapter are public records unless it can be demonstrated to the satisfaction of the city that the release of such information, or part thereof, would reveal production, reserves, or rate of depletion entitled to protection as proprietary information. The city shall identify such proprietary information as a separate part of each application. A copy of all permits, reclamation plans, reports, applications, and other documents submitted pursuant to this chapter, including proprietary information, shall be furnished to the State Geologist by the city upon request. Proprietary information shall be made available to persons other than the State Geologist only

when authorized by the mine operator and by the mine owner in accordance with Section 2778, California Surface Mining and Reclamation Act of 1975.

Angels Camp NFIP Capabilities

In addition to the capabilities in the municipal code regarding floodplains, the City has additional capabilities. Table A-20 shows the County's participation in and continued compliance with the NFIP, as well as identifies areas for improvement that could be potential mitigation actions.

Table A-20 Calaveras County NFIP Capabilities

NFIP Topic	Comments
Insurance Summary	
How many NFIP policies are in the community? What is the total premium and coverage?	28 NFIP policies in Angels Camp. Total premium is $16,864.00. Total coverage is $9,666,000.00. Of the 28 parcels, only 2 are located in the A or AE zones, the remaining 26 are located in the B, C or X zones.
How many claims have been paid in the community? What is the total amount of paid claims? How many of the claims were for substantial damage?	To date, 3 claims have been paid in Angels Camp. Total amount of paid claims is $13,701.37
How many structures are exposed to flood risk within the community? *"flood risk" is defined as the 1% annual chance flood (100-year flood. Numbers are from overlay of FEMA SFHA and building stock data.	47 total parcels and 21 improved parcels are located in FEMA Flood Zone A or AE in the City.
Describe any areas of flood risk with limited NFIP policy coverage	There are 21 structures in the FEMA Flood Zones A or AE. There are currently 28 NFIP policies in the City; only 2 of the parcels located in the 1% Annual Chance Floodplain or 7% maintain flood insurance. These 26 uninsured parcels within the SFHA are at risk without flood insurance coverage. .
Staff Resources	
Is the Community Floodplain Administrator or NFIP Coordinator certified?	No certification.
Provide an explanation of NFIP administration services (e.g., permit review, GIS, education or outreach, inspections, engineering capability)	Permit review.
What are the barriers to running an effective NFIP program in the community, if any?	Limited staffing, additional training needed. NFIP program is otherwise effective.
Compliance History	
Is the community in good standing with the NFIP?	Y
Are there any outstanding compliance issues (i.e., current violations)?	No
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)?	08/26/11
Is a CAV or CAC scheduled or needed?	Yes, a CAV is needed.

NFIP Topic	Comments
Regulation	
When did the community enter the NFIP?	09/05/1990
Are the FIRMs digital or paper?	Digital
Do floodplain development regulations meet or exceed FEMA or State minimum requirements? If so, in what ways?	Meet requirements.
Provide an explanation of the permitting process.	Done during building permit process.
Community Rating System	
Does the community participate in CRS?	No
What is the community's CRS Class Ranking?	N/A
What categories and activities provide CRS points and how can the class be improved?	N/A
Does the plan include CRS planning requirements?	Yes

Source: Calaveras County, FEMA

Incorporation of Hazard Mitigation Plan into Other Plans

Since the creation of the 2010 Calaveras County Local Hazard Mitigation Plan, other plans have been created and/or updated. This includes General Plans, CWPPs, EOPs, other fire plans, and other planning processes. The 2010 LHMP was relied on in the development of the following planning mechanisms in the City of Angels Camp. It was not incorporated into the General Plan, due to the difficulties in the process of making changes in the General Plan.

Jurisdiction	Planning Mechanism 2010 LHMP Was Incorporated/Implemented In. Details?
City of Angels Camp	Wastewater Management Plan
City of Angels Camp	Water Master Plan

A.6.2. Administrative/Technical Mitigation Capabilities

Table A-21 identifies the City department(s) responsible for activities related to mitigation and loss prevention in Angels Camp.

Table A-21 City of Angels Camp Administrative and Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	Y	
Mitigation Planning Committee	N	
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	N	
Mutual aid agreements	Y	The City has agreements with Calaveras County and the surrounding fire districts and water districts.

Other		
Staff	**Y/N FT/PT**	**Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?**
Chief Building Official	Y/FT	The Building Official, Floodplain Administrator, and Emergency manager are roles filled by one staff member.
Floodplain Administrator	Y/PT	See above.
Emergency Manager	Y/PT	See above.
Community Planner	Y/FT	
Civil Engineer	Y/FT	
GIS Coordinator	N	
Other		
Technical	**Y/N**	**Describe capability Has capability been used to assess/mitigate risk in the past?**
Warning systems/services (Reverse 911, outdoor warning signals)	Y	
Hazard data and information	Y	Flood and wildfire
Grant writing	N	
Hazus analysis	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		

A.6.3. Fiscal Mitigation Capabilities

Table A-22 identifies financial tools or resources that the City could potentially use to help fund mitigation activities.

Table A-22 City of Angels Camp Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Y	Funding has not been used in the past for mitigation, but could possibly fund future mitigation activity.
Authority to levy taxes for specific purposes	Y	Funding has not been used in the past for mitigation, but could possibly fund future mitigation activity.
Fees for water, sewer, gas, or electric services	Y	Funding has not been used in the past for mitigation, but could possibly fund future mitigation activity.

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Impact fees for new development	Y	Funding has not been used in the past for mitigation, but could possibly fund future mitigation activity.
Storm water utility fee	Y	Funding has not been used in the past for mitigation, but could possibly fund future mitigation activity.
Incur debt through general obligation bonds and/or special tax bonds	Y	Funding has not been used in the past for mitigation, but could possibly fund future mitigation activity.
Incur debt through private activities	N	
Community Development Block Grant	Y	Funding has not been used in the past for mitigation, but could possibly fund future mitigation activity.
Other federal funding programs	Y	Funding has not been used in the past for mitigation, but could possibly fund future mitigation activity.
State funding programs	Y	Funding has not been used in the past for mitigation, but could possibly fund future mitigation activity.
Other		
How can these capabilities be expanded and improved to reduce risk?		

A.6.4. Mitigation Education, Outreach, and Partnerships

Table A-23 identifies education and outreach activities that the City uses to help fund mitigation activities.

Table A-23 City of Angels Camp Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Y	The City partners with the Red Cross and various environmental groups. These groups can be used to implement future actions.
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Y	The City partners with state and federal fire agencies. Partnerships with these groups could assist in future mitigation programs/actions.
Natural disaster or safety related school programs	Y	Public Outreach Programs at local schools on Fire Safety
StormReady certification	N	

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Firewise Communities certification	N	
Public-private partnership initiatives addressing disaster-related issues	N	
Other		Partnership with Calaveras County
How can these capabilities be expanded and improved to reduce risk?		

A.6.5. Other Mitigation Efforts

Other mitigation related programs and projects that Angels Camp has implemented in the past include the following:

- Public Outreach at local schools on Fire Safety
- Drought conservation outreach and education
- Free sandbags to residents during flooding
- Improved construction standards
- Tree trimming along roads
- Creek cleanup efforts (to reduce localized flooding)
- Fire Extinguisher Use Trainings at Local Businesses
- Weed Abatement Ordinance
- City adopted a Burn Ordinance in 2012

A.7 Mitigation Strategy

This section describes the mitigation strategy process and mitigation action plan for the City of Angels Camp's inclusion with the Calaveras County Local Hazard Mitigation Plan update.

A.7.1. Mitigation Goals and Objectives

The City of Angels Camp adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy of the base plan. These goals and mitigation strategy of this Plan Update are desires based on the LHMP Update process. Nothing in this Plan Update should be construed as a mandate on the City.

A.7.2. Continued Compliance with the NFIP

The City of Angels Camp joined the NFIP on September 24, 1984. As a participant of the National Flood Insurance Program (NFIP), the City of Angels Camp has administered floodplain management regulations that meet the minimum requirements of the NFIP. The management program objective is to protect people and property within the City. The City of Angels Camp will continue to comply with the requirements of the NFIP in the future.

The City's regulatory activities apply to existing and new development areas of the City; implementing flood protection measures for existing structures and maintaining drainage systems. The goal of the program is to enhance public safety, and reduce impacts and losses while protecting the environment.

The City of Angels Camp Planning and Engineering Department provides public outreach activities which include map information services, public awareness, public hazard disclosure, and flood protection information. This information is readily available to the public and consists of current and accurate flood mapping. In addition, the Planning and Engineering Department provides information about the stormwater management program and up-to-date information related to the maintenance of the drainage system.

The National Flood Insurance Program's (NFIP) Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS which are to reduce flood losses, facilitate accurate insurance rating, and promote the awareness of flood insurance. The City of Angels Camp is not a participant in the CRS program.

A.7.3. Mitigation Actions

The planning team for the City of Angels Camp identified and prioritized the following mitigation actions based on the risk assessment and in accordance with the process outline in Section 5, Mitigation Strategy, of the base plan. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. General processes and information on plan implementation and maintenance of this LHMP by all participating jurisdictions is included in Section 7, Plan Implementation and Maintenance, of the base plan.

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

Hazards Addressed: All

Issue/Background: Local jurisdiction reimbursement for mitigation projects and cost recovery after a disaster is guided by Government Code Section 8685.9. Specifically, this section requires that the County must 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 adopted pursuant to subdivision (g) of Section 65302, in order to seek reimbursement greater than 75 percent of the State eligible costs. To seek full reimbursement, it is important for Angels Camp to incorporate the County's LHMP Update into the safety element as part of the next general plan update.

Other Alternatives: No feasible alternatives

Existing Planning Mechanisms through which Action will be Implemented: Safety Element of General Plan

Responsible Office: Angels Camp Planning Department

Priority (High, Medium, Low): High

Cost Estimate: To be determined

Benefits (avoided Losses): Planning documents will help the City maximize potential for state reimbursement post-disaster

Potential Funding: State and/or Federal Grant, existing budgets

Timeline: As soon as possible

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

Hazards Addressed: Multi-Hazard

Issue/Background: Angels Camp is subject to several natural hazards, each which pose 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 can reduce the impact, such that the HMPC has recommended specific actions be taken. For other hazards, where either the likelihood of occurrence is very low, or the area of likely impact is not specifically known, or there is very little that can be done to reduce the impacts, that the HMPC has determined that the best approach would simply be public awareness. This should include 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 State Office of Emergency Services, and the American Red Cross.

Other Alternatives: Continue public information activities currently implemented

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Office: City of Angels Camp Police Department in conjunction with the Calaveras County Sherriff's Office

Priority (H, M, L): Medium

Cost Estimate: To be determined depending upon printing and mailing costs, level of volunteer participation, and scope and frequency of events.

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

Potential Funding: Staff time; FEMA grants

Timeline: Ongoing - Part of seasonal multi-hazard public awareness campaign

Action 3. Retrofit At-Risk Structures with Ignition-Resistant Materials

Hazards Addressed: Wildfire

Issue/Background: Existing structures in wildfire hazard areas inside Angels Camp can be protected through the use of non-combustible materials and technologies, including:

- Installing roof coverings, sheathing, flashing, skylights, roof and attic vents, eaves, and gutters that conform to ignition-resistant construction standards.
- Installing wall components that conform to ignition-resistant construction standards.
- Protecting propane tanks or other external fuel sources.
- Purchasing and installing external, structure-specific water hydration systems (sprinklers); dedicated power sources; and dedicated cisterns if no water source (e.g., lake, river, or swimming pool) is available.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Office: City of Angels Camp Fire Department in conjunction with the Calaveras Fire Safe Council, CAL FIRE, and neighboring local fire districts.

Priority (H, M, L): Low

Cost Estimate: To be determined on a case by case basis.

Benefits (Losses Avoided): Reduced risk of wildfire to individual properties at risk to wildfire due to their construction. In addition, the adjacent properties to those structures not built to fire code (or built before code enforcement) would see reduced risk as well.

Potential Funding: PDM, HMGP

Timeline: As soon as funding is available.

Action 4. Create Defensible Space Around Structures and Infrastructure

Hazards Addressed: Wildfire

Issue/Background: Angels Camp can implement defensible space programs to reduce risk to structures and infrastructure, including:

- Creating buffers around residential and non-residential structures through the removal or reduction of flammable vegetation, including vertical clearance of tree branches.
- Replacing flammable vegetation with less flammable species.
- Creating defensible zones around power lines, oil and gas lines, and other infrastructure systems.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: CWPP

Responsible Office City of Angels Camp Fire Department in conjunction with the Calaveras Fire Safe Council, CAL FIRE, and neighboring local fire districts.

Priority (H, M, L): High

Cost Estimate: To be determined on a case by case basis.

Benefits (Losses Avoided): Reduced risk of wildfire damage to properties in Calaveras County. Reduced risk of injury and fatality to firefighters.

Potential Funding: PDM, HMGP

Timeline: As soon as funding is available.

Action 5. Conduct Maintenance to Reduce Risk

Hazards Addressed: Wildfire

Issue/Background: Angels Camp can implement maintenance procedures to reduce wildfire risk, including:

- Performing arson prevention cleanup activities in areas of abandoned or collapsed structures, accumulated trash or debris, and with a history of storing flammable materials where spills or dumping may have occurred.
- Preventing or alleviating wildfires by proper maintenance and separation of power lines as well as efficient response to fallen power lines.
- Routinely inspecting the functionality of fire hydrants.
- Requiring and maintaining safe access for fire apparatus to wildland-urban interface neighborhoods and properties.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: CWPP

Responsible Office: City of Angels Camp Fire Department in conjunction with the Calaveras Fire Safe Council, CAL FIRE, and neighboring local fire districts.

Priority (H, M, L): High

Cost Estimate: To be determined on a case by case basis.

Benefits (Losses Avoided): Reduced risk of wildfire damage to properties in the City. Reduced risk of injury and fatality to firefighters.

Potential Funding: PDM, HMGP

Timeline: As soon as funding is available.

Action 6. Implement a Fuels Management Program

Hazards Addressed: Wildfire

Issue/Background: The City of Angels Camp desires a fuels management program to be implemented to reduce hazardous vegetative fuels on public lands, near essential infrastructure, or on private lands by working with landowners. The program may include the following:

- Performing maintenance including fuel management techniques such as pruning and clearing dead vegetation, selective logging, cutting high grass, planting fire-resistant vegetation, and creating fuel/fire breaks (i.e., areas where the spread of wildfires will be slowed or stopped by the removal of fuels).
- Using prescribed burning to reduce fuel loads that threaten public safety and property.
- Identifying and clearing fuel loads created by downed trees.
- Cutting firebreaks into public wooded areas in the wildland-urban interface.
- Sponsoring local "slash and clean-up days" to reduce fuel loads along the wildland-urban interface.
- Linking wildfire safety with environmental protection strategies (i.e., improving forest ecology, wildlife habitat, etc.).
- Developing a vegetation management plan.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: CWPP

Responsible Office: City of Angels Camp Fire Department in conjunction with the Calaveras Fire Safe Council, CAL FIRE, and neighboring local fire districts.

Priority (H, M, L): High

Cost Estimate: To be determined.

Benefits (Losses Avoided): Reduced risk of damage to property. Increased life safety for homeowners and firefighters.

Potential Funding: PDM, HMGP

Timeline: As soon as funding is available.

Action 7. Participate in Firewise Program

Hazards Addressed: Wildfire

Issue/Background: The Firewise program provides a series of steps that individual residents and their neighbors can take to keep their homes and neighborhoods safer from fire. Angels Camp has considered joining the Firewise program.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Office: City of Angels Camp Fire Department in conjunction with the Calaveras Fire Safe Council, CAL FIRE, and neighboring local fire districts.

Priority (H, M, L): High

Cost Estimate: To be determined.

Benefits (Losses Avoided): Reduced risk to wildfire due to individual property owners taking steps to protect their own properties.

Potential Funding: PDM, HMGP

Timeline: As soon as funding is available.

Action 8. Increase Wildfire Risk Awareness

Hazards Addressed: Wildfire

Issue/Background: Education and outreach programs can target citizens, businesses, developers, landscapers, and insurers among others to increase awareness of wildfire risk and strategies for protecting homes and infrastructure. Angels Camp has considered:

- Offering GIS hazard mapping online for residents, developers, and design professionals.
- Organizing a local fire department tour to show local elected officials and planners the most vulnerable areas of the community's wildland-urban interface and increase their understanding of risks.
- Working with insurance companies, utility providers, and others to include wildfire safety information in materials provided to area residents.
- Developing partnerships with neighborhood groups, homeowners' associations, and others to conduct outreach activities.
- Using local fire departments to conduct education programs in schools.
- Informing the public about proper evacuation procedures.
- Forming a citizen plan implementation steering committee to monitor progress of local mitigation actions. Include a mix of representatives from neighborhoods, local businesses, and local government.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Office: City of Angels Camp Fire Department in conjunction with the Calaveras Fire Safe Council, CAL FIRE, and neighboring local fire districts.

Priority (H, M, L): High

Cost Estimate: Staff time.

Benefits (Losses Avoided): Reduced wildfire risk due to increased homeowner knowledge and understanding of their individual wildfire risk.

Potential Funding: PDM, HMGP

Timeline: Ongoing

Action 9. Educate Property Owners about Wildfire Mitigation Techniques

Hazards Addressed: Wildfire

Issue/Background: Angels Camp can reduce risk to wildfire by educating property owners on actions that they can take to reduce risk to property, such as the following:

- Installing fire mitigation systems such as interior and exterior sprinkler systems.
- Performing safe disposal of yard and household waste rather than open burning.
- Removing dead or dry leaves, needles, twigs, and combustibles from roofs, decks, eaves, porches, and yards.
- Creating a defensible space or buffer zone cleared of combustible materials around property.
- Installing and maintaining smoke detectors and fire extinguishers on each floor of their homes or other buildings.
- Safely using and storing necessary flammable materials, including machine fuels. Approved safety cans should be used for storing gasoline, oily rags, and other flammable materials. Firewood should be stacked at least 100 feet away and uphill from homes.
- Keeping flammables, such as curtains, secured away from windows or using heavy fire-resistant drapes.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Office: City of Angels Camp Fire Department in conjunction with the Calaveras Fire Safe Council, CAL FIRE, and neighboring local fire districts.

Priority (H, M, L): High

Cost Estimate: Staff time. Advertising and printing costs.

Benefits (Losses Avoided): Reduced wildfire risk due to increased homeowner knowledge and understanding of their individual wildfire risk.

Potential Funding: PDM, HMGP

Timeline: Ongoing

Action 10. Reclaimed Water Line

Hazards Addressed: Agricultural Hazard/Drought and Water Shortage

Issue/Background: Agriculture is a large part of the economic commerce of the County which connects to tourism within the City. The proposed mitigation project is to construct a reclaimed water line from the City Tertiary Treatment Plan to nearby agriculture land and recreational soccer fields. This project would provide a consistent source of irrigation while improving the agriculture and recreational commerce of the region.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: None, this project has not been included in any existing planning documents.

Responsible Office: City of Angels, Public Works Department

Priority (H, M, L): Low

Cost Estimate: $3,000,000

Benefits (Losses Avoided): Increased resilience to drought for the agricultural community.

Potential Funding: Grants, Loans, and Enterprise accounts

Timeline: Ongoing

Action 11. Water Storage Tank

Hazards Addressed: Drought and Water Shortage/Wildfire

Issue/Background: To increase reliability of the City water system and to avoid service interruptions, a new 1.4 million gallon storage tank is sought. The tank site recommended is located in proximity to the proposed pipeline supply route for proposed well sites. This would facilitate filling the tank and provide a suitable parallel storage source for the City.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: This project is included in the Water Master Plan which was adopted by the City Council

Responsible Office: City of Angels, Public Works Department

Priority (H, M, L): Medium

Cost Estimate: $2,000,000

Benefits (Losses Avoided): Increased water storage during times of drought. Additional water for firefighting purposes.

Potential Funding: Grants, Loans, and Enterprise accounts

Timeline: Ongoing

Action 12. Sewer Line to Fairgrounds

Hazards Addressed: Multi-hazard

Issue/Background: The Fairgrounds is the designated site for emergency operations. During the Butte Fire there were about 4000 staff in the fairgrounds base camp. The onsite sewer treatment system failed and polluted a nearby creek. After the emergency event the fairgrounds became the home for those evacuated and those who are now homeless. The sewer system continues to be overloaded.

Other Alternatives: Expand the onsite sewer system, however, that will force the fair to maintain a system far larger than needed for normal operations.

Existing Planning Mechanism(s) through which Action Will Be Implemented: None, this project has not been included in the City of Angels Wastewater Master Plan.

Responsible Office/Partners: City of Angels; Calaveras County Fair Board (39th District Agricultural Association)

Project Priority: Medium

Cost Estimate: $850,000

Benefits (Losses Avoided): Protection of Six Mile Creek; Prevention of Health Impacts from Sewer Spills, Ability to operate the operation center at any size without concern for sanitary sewer limitations.

Potential Funding: FEMA, State Revolving Fund, grants, benefit district.

Timeline: 3 years from receipt of funding

Action 13. Storm Drain Master Plan

Hazards Addressed: Localized Flooding.

Issue/Background: The City has never had a storm drain plan except for recent developments. As an old historic city, many of the critical storm drains are in a location that could cause damage. As the City grows, storm drain standards and design would help avoid damages from flooding.

Other Alternatives: None.

Existing Planning Mechanism(s) through which Action Will Be Implemented: The design and standards would be incorporated into the City Improvement Standards. Also, once the storm water plan is adopted it can be used during environmental reviews of entitlements to create conditions of approval.

Responsible Office/Partners: City of Angels

Project Priority: Medium

Cost Estimate: $45,000

Benefits (Losses Avoided): Damages from localized flooding will be avoided. The historic district will be protected.

Potential Funding: FEMA, City funds.

Timeline: 3 years from receipt of funding

Action 14. Emergency Power to Command Center and Cooling/Warming Centers

Hazards Addressed: All Events requiring a command center, all weather events requiring housing.

Issue/Background: The City Fire Department is the designated EOC and the weather centers are at the Fire Department and the Police Department. The Police Department building also contains a storage warehouse that can be used for a cooling/heating center for animals. Both buildings are connected to power, but do not have a backup system. The backup can be either a generator or solar generated. During the Butte Fire there were no shortages of fuel, but a generator is problematic and a solar system may perform better.

Other Alternatives: None.

Existing Planning Mechanism(s) through which Action Will Be Implemented: None. This project has been included in the City of Angels Emergency Operations Plan, but the actual project has not been reviewed.

Responsible Office/Partners: City of Angels

Project Priority: Medium

Cost Estimate: $85,000

Benefits (Losses Avoided): Electrical supply stability, Cooling/Heating Centers.

Potential Funding: FEMA, City funds.

Timeline: 3 years from receipt of funding

Action 15. Emergency Responder Flood Training

Hazards Addressed: All Flood Related Events.

Issue/Background: The City emergency responders are trained for the issues normally encountered and for a small amount of unique emergencies. Typically the responders rely on adjacent agencies for assistance; however none of the local agencies have been trained in flood style response or swift water

training. The nearest available assistance is hours away and during a flood event, that staff will most likely be responding to emergencies within their district.

Other Alternatives: None.

Existing Planning Mechanism(s) through which Action Will Be Implemented: None. This project will be implemented by City of Angel's staff.

Responsible Office/Partners: City of Angels

Project Priority: Medium

Cost Estimate: $60,000

Benefits (Losses Avoided): Safe rescue of people in need. Safe procedures to protect the emergency responders.

Potential Funding: FEMA, City funds.

Timeline: 3 years from receipt of funding

Action 16. Water Line to Whittle Road

Hazards Addressed: Fire Event, Drought, Water Shortage.

Issue/Background: Whittle Road is a road south of the City, but outside the City limits. This area is populated and still depends on wells for drinking water, but is adjacent to an underground salt water basin. Due to the salt water, water was trucked to the school and church. During the drought, many of the wells had a reduced capacity. A water line to this area will also provide fire service for both wildfire and structure in the developed areas.

Other Alternatives: None, the City is the nearest and most able supplier.

Existing Planning Mechanism(s) through which Action Will Be Implemented: None, this project has not been included in the City of Angels Water Master Plan.

Responsible Office/Partners: City of Angels

Cost Estimate: $1,200,000

Benefits (Losses Avoided): Water supply stability, Treated Water, Fire Protection.

Potential Funding: FEMA, State Revolving Fund, grants, benefit district.

Timeline: 3 years from receipt of funding

Project Priority: Medium

Appendix A Planning Process

Table A-1 Calaveras County HMPC Meeting Attendees

Name	Title	Department	HMPC #1	HMPC #2	HMPC #3
Sherri Munson		Calaveras County Sheriff's Office/OES	X	X	X
Rick Muckey		Calaveras County Sheriff's OES	X	X	X
Michael Oliveira	County BOS	Calaveras County Board of Supervisors	X		
Dennis Huberty		Calaveras County Sheriff's OES	X		X
Shirley Ryan	County CAO	Calaveras County Administration	X	X	
Steve Kouacs		Copper Murphy's Fire	X		
Peter Maurer	Director of Planning	Calaveras County Planning Department	X		
Dennis Lewis		Red Cross/CERT	X	X	X
Roy Evans		Cal Fire	X		
Joe Teneyck		Cal Fire ECC	X		
Scott Frend		Cal Fire Arnold	X		
Bill Wennhold		Mark Twain Hospital	X		
Joyce Techet		Calaveras Planning Coalition Community Action Project	X		
Teresa Tanaka		Calaveras County Water District	X		
Wade Whitney		Calaveras County Sheriff's Office		X	X
David Bahr		Calaveras PUD		X	
Jeff Millar		PG&E		X	X
Jeff White		Calaveras County Building Department		X	
Brian Moss		Calaveras County Environmental Management		X	
Cori Mooy		Calaveras County Air Pollution Control		X	X
Henning Schriebes		Calaveras County Animal Services		X	X
Zachariah Collom		Calaveras County Public Works Facilities		X	X
John Lawless		Calaveras County Health and Human Services		X	X
Kevin Wright	Agricultural Commissioner	Calaveras County Agriculture		X	X
Colleen Haerr		City of Angels		X	

Name	Title	Department	HMPC #1	HMPC #2	HMPC #3
Mary Sawickie		Calaveras County Health & Human Services		X	X
Debbie Celeto		American Red Cross		X	
Todd Fordahl		Angels Camp Police Department		X	
Peter Martin		Calaveras County Water District			X
Dan Nygren		Calaveras County Building Department			X
Bill Fullerton		Calaveras County Fire Safe Council			X
Jason Robitaille		Calaveras Consolidated, Cal-Co Fire			X
Dana Ellis		Cal OES			X
Curt Edson	BOS	Calaveras County BOS			X
Mike Blankenship		Cal Fire			X

From: Mary Rose Rutikanga
Sent: Friday, March 13, 2015 4:31 PM
To: mchimente@bhuhsd.k12.ca.us; mmerrill@calaveras.k12.ca.us; mnagano@ccoe.k12.ca.us; JDennis@ccoe.k12.ca.us; kvail@mtwain.k12.ca.us; fmier@calaveras.k12.ca.us; dogden@vsd.k12.ca.us; kstarkovich@calaveras.k12.ca.us; ktriance@mtwain.k12.ca.us; bloring@vsd.k12.ca.us; mbesmer@calaveras.k12.ca.us; mcampbell@calaveras.k12.ca.us; tcrothers@calaveras.k12.ca.us; ahasselwander@calaveras.k12.ca.us; rmalamed@calaveras.k12.ca.us; kgriggs@calaveras.k12.ca.us; firechief@epfd.org; Mike.blankenheim@fire.ca.gov; cameron.todd@fire.ca.gov; carrollj@volcano.net; nick.casci@fire.ca.gov; Edward Cavalli; Roy.evans@fire.ca.gov; billfullerton@sbcglobal.net; mario.hernandez@fire.ca.gov; gary.humphrey@calema.ca.gov; s_kovacs@sbcglobal.net; eric.kurtz@fire.ca.gov; scottk96@caltel.com; rmurdock@mvemsa.com; andy.murphy@fire.ca.gov; Pmurphy@mvemsa.com; gregpetersen@angelscamp.gov; Chris.Post@fire.ca.gov; nathanpry@angelscamp.gov; jrobitaille@calcofire.org; jramfd22@yahoo.com; Edward Cavalli; jstone@centralcalaverasfire.org; Cameron.Todd@fire.ca.gov; Josh.White@fire.ca.gov; safpd@goldrush.com; jhungerford@vsd.k12.ca.us; michaelmchatten@angelscamp.go; stevenflaigg@angelscamp.gov; Adele Baroni; Bill Perley; Carole Crawford; Chris Bennett; Christopher Hewitt; Dana Ellis; Debbie Calcote; Dennis Huberty; Dennis Lewis; Dewayne Lewis; Gary Kuntz; Jeff Millar ; Jim Macedo; Karl Benson; Mary Sawicki; Mike Johnson; Mike Muehlbauer; Rick Muckey; Robert Pachinger; Scott Anderson; Sherri Munson; Sherry Moranz; Shirley Ryan; Teresa Tanaka; Terry Bullock; Todd Fordahl; Wade Whitney
Cc: Shirley Ryan
Subject: Calaveras County Local Hazard Mitigation Plan Update: Kickoff meeting - March 18, 2015 @ 2pm

Greetings:

Calaveras County is kicking off efforts to update the County's Local Hazard Mitigation Plan (LHMP) which was originally developed in 2010. The purpose of the LHMP Update process is to help reduce the impacts of natural hazards to the citizens, property, and critical infrastructure in Calaveras County. The plan is due for its 5-year update as required by the Disaster Mitigation Act of 2000 (DMA 2000). DMA 2000 requires that local governments have a FEMA approved Hazard Mitigation Plan in place in order to maintain their eligibility for certain pre- and post-disaster funding utilized to protect communities from future disaster-related losses. You are receiving this notice because we would like to invite you to take part in this plan update as a member of the Hazard Mitigation Planning Committee (HMPC).
Community participation and coordination is a requirement of an approved plan, as is the inclusion of any proposed project your organization may want to submit for future FEMA mitigation funding (e.g., a flood, wildfire or severe weather mitigation project). Thus, your participation in this process is important and encouraged. You have key knowledge and data that will be needed to update this plan, and thus your input will be critical to our joint success.

Participation includes:

- Attending and participating in the HMPC meetings (4 anticipated over the next 6-8 months)
- Providing available data/information requested of the HMPC
- Reviewing and providing comments on the plan drafts

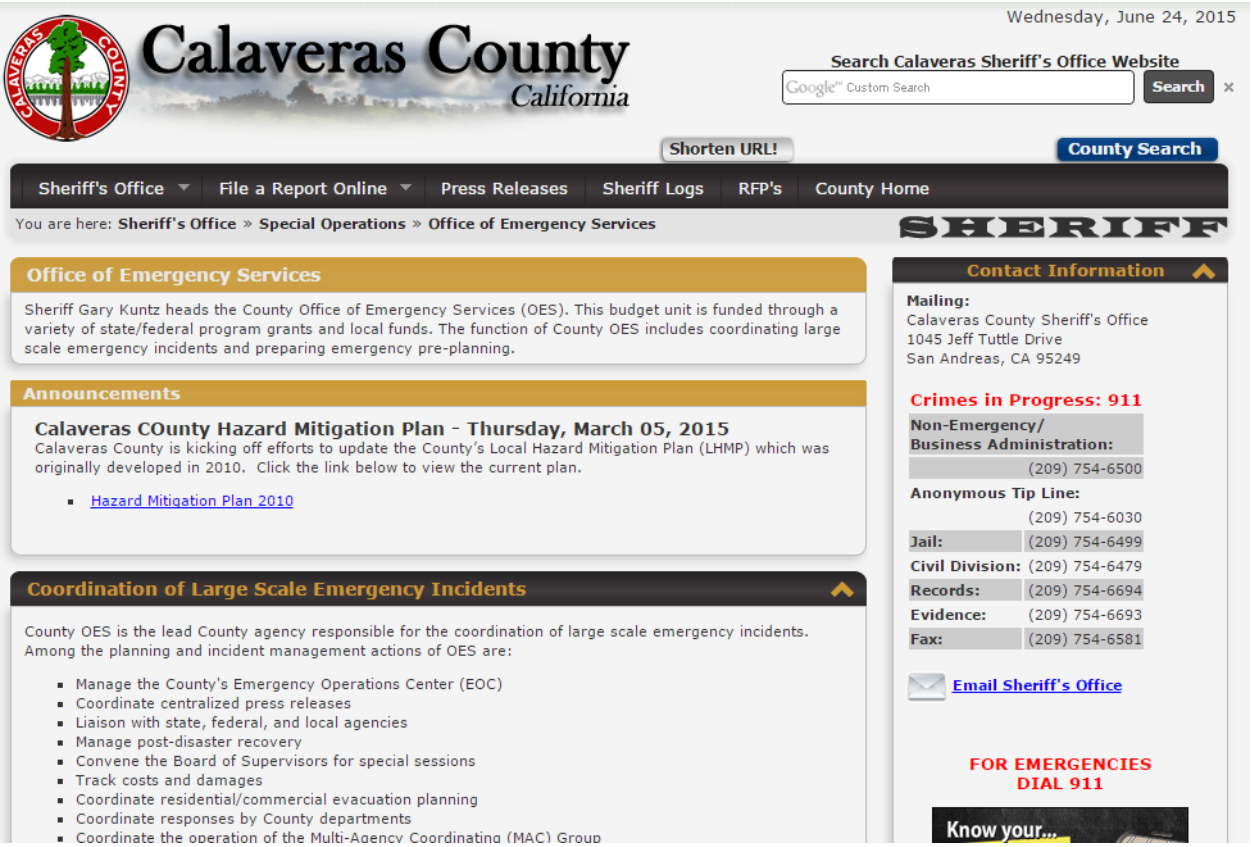
The Calaveras County Office of Emergency Services is taking the lead on coordinating the plan update for the County. The project kickoff meeting will be held March 18, 2015 from 2-4pm, Board of Supervisors room, 891 Mountain Ranch Road, San Andreas, CA 95249. This meeting will explain the process and get the Plan Update started. A public stakeholder meeting will also be held the evening of the same day at 5pm.

For your reference the existing plan can be accessed here: http://sheriff.calaverasgov.us/SheriffsOffice/SpecialOperations/OfficeofEmergencyServices.aspx

Please RSVP and plan on attending or delegating attendance to this important planning process. For additional information, please contact Sherri Munson at 209-754-2888 or email at SMunson@co.calaveras.ca.us.

Regards,

Mary Rose Rutikanga | Senior Administrative Analyst
Calaveras County Administrator's Office | 891 Mountain Ranch Road | San Andreas, CA 95249
209-754-6025 | mrutikanga@co.calaveras.ca.us



March 3, 2015

FOR IMMEDIATE RELEASE

CONTACT: Sherri Munson, Calaveras County OES, 209-754-2888

CALAVERAS COUNTY INVITES PARTICIPATION IN HAZARD MITIGATION PLAN UPDATE

Calaveras County is leading a Local Hazard Mitigation Plan (LHMP) Update to their 2010 plan. The purpose of this LHMP Update is to assess risk to natural hazards such as floods, wildfires, and severe weather events; implement actions to reduce future losses; and maintain eligibility for federal mitigation funds in accordance with the Disaster Mitigation Act of 2000. Partnering with the County in this planning effort is the City of Angels Camp.

Nationwide, taxpayers pay billions of dollars annually helping communities, organizations, businesses, and individuals recover from disaster. Some disasters are predictable and, in many cases, much of the damage can be reduced or even eliminated through mitigation planning.

The Calaveras County Office of Emergency Services (OES) will be hosting two meetings to kick off the process to update their current 2010 LHMP. Officials from Calaveras County, the City of Angels Camp, state and local agencies, members of the public, and other interested stakeholders are invited to participate in this planning effort. A hazard mitigation planning committee will be established as part of the plan development process.

Separate meetings are scheduled for 2 p.m. (planning committee meeting) and 5 p.m. (public meeting) on Wednesday, March 18, 2015 at the Board of Supervisors room, 891 Mountain Ranch Road, San Andreas, CA 95249.

The 2 p.m. meeting is targeted for the planning committee; the 5 p.m. meeting is targeted for the public. However, the public is encouraged to come to either meeting at their convenience. The purpose of the kickoff meetings is to inform the planning committee, participating jurisdictions, and other interested stakeholders about the purpose and process of the plan and to describe how to participate and the benefits of doing so.

Calaveras County OES is taking the initiative to develop this plan update utilizing the expertise of consultants with Foster Morrison Consulting, Ltd., a firm that specializes in hazard mitigation and emergency management. Please come to the kickoff meeting to learn more about hazard mitigation and the LHMP Update process.

For more information on this project and how you can be involved, contact Sherri Munson at 209-754-2888 or SMunson@co.calaveras.ca.us.

AGENDA

Calaveras County
Local Hazard Mitigation Plan (LHMP) Update
Kickoff Meeting: March 18, 2015

1. Introductions
2. Hazard Mitigation & the Disaster Mitigation Act Planning Requirements
3. The Role of the Hazard Mitigation Planning Committee (HMPC)
4. Planning for Public Input
5. Coordinating with other Agencies
6. Hazard Identification
7. Data Needs
8. Questions and Answers

Calaveras County Hazard Identification and Profiles – 2015

Calaveras County 2010 Hazards

- Avalanche*
- Coastal Erosion*
- Coastal Storm*
- Dam/Levee Failure
- Drought
- Earthquake
- Expansive Soils
- Extreme Heat
- Flood
- Hailstorm*
- Hurricane*
- Land Subsidence*
- Landslide
- Severe Winter Storm
- Tornado*
- Tsunami*
- Volcano
- Wildfire
- Windstorm

*indicates hazard identified, but not profiled.

Calaveras County Historic Hazard Occurrences

Table A-2 NCDC Severe Weather Events for Calaveras County 1950-10/31/2014

Event Type	Number of Events	Deaths	Injuries	Property Damage	Crop Damage
Avalanche	1	0	2	$0	$0
Blizzard	1	0	0	$50,000	$0
Cold/Wind Chill	1	0	0	$0	$0
Dense Fog	7	1	9	$150,000	$0
Dust Storm	1	0	0	$100,000	$0
Flood	15	2	4	$389,330,000	$0
Heat	3	9	0	$0	$0
Heavy Rain	1	0	0	$0	$0
Heavy Snow	22	3	2	$200,000	$0
High Wind	54	5	12	$406,000	$0
Strong Wind	8	0	0	$5,000	$0
Tornado	1	0	0	$0	$0
Wildfire	1	0	0	$0	$0
Winter Storm	24	2	1	$125,000	$0
Winter Weather	2	14	0	$0	$0
Total	**142**	**36**	**30**	**$390,366,000**	**$0**

Source: NCDC

Table A-3 Disaster Declaration History 1950-2014

Hazard Type	Disaster Name	Disaster Number	State Declaration	Federal Declaration	# of Deaths	# of Injuries	Costs
Flood	Floods	CDO 50-01	11/21/50	–	9	–	$32.2 million
Flood	Floods	DR-47	12/22/55	12/23/55	74	–	$200.0 million
Flood	Storm/Flood Damage	DR-82	04/02/58	4/4/58	13	several	$24.0 million
Flood	1969 Storms	DR-253	02/08/69	1/26/69	47	161	$300.0 million
Drought	Drought	N/A	02/09/76	–	–	–	$2.7 billion
Flood	1980 April Storms	80-01 – 80-25	4/1/1980	–	–	–	–
Flood	Heavy Rains and Flooding	DC 82-03	4/1/1982	–	–	–	–
Severe Storm	Storms	DR-758	02/20/86	2/18/86	13	67	$407.5 million
Fire	Wildfire	N/A	07/21/88	–	–	–	–
Fire	Fountain	DR-958	08/02/92	8/29/92	–	8	$54.0 million
Severe Storm/ Flood	Late Winter Storms	DR-1044	–	1/10/95	17	–	$1.1 billion
Flood	1997 January Flood	DR-1155	1/2/97-1/31/97	1/4/1997	8	–	$194 million
Flood	January 1997 Floods	–	01/03/97	–	8	–	$1.8 billion
Flood	El Nino	DR-1203	–	02/02/98	17	–	$550.0 million
Fire	Wildfire	–	09/10/01	–	–	–	$6.7 million
Fire	Calaveras Complex	FM-2540	–	8/8/2004	–	–	$4.6 million
Fire	Pattison Fire	FM-2553	–	9/4/2004	–	–	$3.6 million
Severe Storm/ Flood	Severe Storms, Flooding, Landslides, Mudslides	DR-1646	–	6/5/06	–	–	–
Drought	Central Valley Drought	-	6/12/2008	–	–	–	–
Flood, debris and mud flows	2010 Severe Winter Storm	DR-1884	1/27/2010	3/8/2010	2	–	$37,065,584
Storms	November Storms	GP 2010-14	11/30/2010; 12/09/2010	–	–	–	$160,280
Drought	California Drought	GP 2014-13	1/17/2014	–	–	–	–

Calaveras County 2015 LHMP Hazards

Table A-4 Hazards Comparison List

2010 Calaveras County Plan*	2013 State of California Plan Applicable Hazards	Proposed 2015 Hazards (Natural)
Avalanche*	Agriculture Pests and Diseases	Avalanche
Coastal Erosion*	Avalanche	Dam Failure
Coastal Storm*	Coastal Flooding, Erosion and Sea Level Rise	Drought and Water Shortage
Dam/Levee Failure	Dam Failure	Earthquake
Drought	Droughts and Water Shortage	Flood 100/500 year
Earthquake	Earthquake	Flood: Localized Stormwater Flooding
Expansive Soils	Epidemic/Pandemic/Vector Borne Disease Hazards	Levee Failure
Extreme Heat	Extreme Heat	Severe Weather: Extreme Heat
Flood	Flood	Severe Weather: Heavy Rains and Storms
Hailstorm*	Freeze	Severe Weather: Tornadoes
Hurricane*	Hazardous Materials Release/Oil Spills	Severe Weather: Winter Storms and Extreme Cold
Landslide	Landslide	Severe Weather: Wind
Severe Winter Storm	Levee Failure	Soil Hazard: Erosion
Tornado*	Severe Weather and Storms	Soil Hazard: Expansive Soils
Tsunami*	Volcano	Soil Hazards: Landslides and Debris Flows
Volcano	Wildfire	Soil Hazard: Subsidence
Wildfire		Volcano
Windstorm		Wildfire
*identified in 2010 plan but not profiled		Blue?????

Table A-5 Calaveras County Hazard Identification Table (Blank)

Hazard	Geographic Extent	Probability of Future Occurrences	Magnitude/ Severity	Significance
Avalanche				
Dam Failure				
Drought and Water Shortage				
Earthquake				
Flood 100/500 year				
Flood: Localized Stormwater Flooding				
Levee Failure				
Severe Weather: Extreme Heat				
Severe Weather: Heavy Rains and Storms				
Severe Weather: Tornadoes				
Severe Weather: Winter Storms and Extreme Cold				
Severe Weather: Wind				
Soil Hazard: Erosion				
Soil Hazard: Expansive Soils				
Soil Hazards: Landslides and Debris Flows				
Soil Hazard: Subsidence				
Volcano				
Wildfire				

Geographic Extent
Limited: Less than 10% of planning area
Significant: 10-50% of planning area
Extensive: 50-100% of planning area

Significance
Low: minimal potential impact
Medium: moderate potential impact
High: widespread potential impact

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—10-25 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

Probability 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.

Table A-6 City of Angels Camp Hazard Identification Table (Blank)

Hazard	Geographic Extent	Probability of Future Occurrences	Magnitude/ Severity	Significance
Avalanche				
Dam Failure				
Drought and Water Shortage				
Earthquake				
Flood 100/500 year				
Flood: Localized Stormwater Flooding				
Levee Failure				
Severe Weather: Extreme Heat				
Severe Weather: Heavy Rains and Storms				
Severe Weather: Tornadoes				
Severe Weather: Winter Storms and Extreme Cold				
Severe Weather: Wind				
Soil Hazard: Erosion				
Soil Hazard: Expansive Soils				
Soil Hazards: Landslides and Debris Flows				
Soil Hazard: Subsidence				
Volcano				
Wildfire				

Geographic Extent
Limited: Less than 10% of planning area
Significant: 10-50% of planning area
Extensive: 50-100% of planning area

Significance
Low: minimal potential impact
Medium: moderate potential impact
High: widespread potential impact

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—10-25 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

Probability 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.

SIGN-IN SHEET
Calaveras County
LOCAL HAZARD MITIGATION PLAN UPDATE PROJECT
HMPC Kickoff Meeting #1
March 18, 2015

Name/Title	Email Address	Phone	City/Organization/ Affiliation
Sheri Munson / OES	smunson@co.calaveras.ca.us	754-2888	Sheriff / OES
Rick Mulkey / OES	RMULKEY@CO.CALAVERAS.CA.US	754-2895	SHERIFF / OES
MICHAEL OLIVEIRA	MOLIVEIRA@CO.CALAVERAS.CA.US	754-6308	BOS
DENNIS HABERTY	Dhaberty@co.Calaveras.ca.us	754-6492	SHERIFF - OES
Shirley Ryan	SRyan@co.calaveras.ca.us	754-6025	CAO
STEVE KOVACS	s-kovacs@sbcglobal.net	765-0262	Copper Murphys Fire
Peter Maurer	pmaurer@co.calaveras.ca.us	754-2850	County Planning Dept.
Dennis Lewis	dennis.lewis@redcross.org	712-3120	Red Cross / CERT
Roy EVANS	roy.evans@fire.ca.gov	419-4404	CAL-Fire
Joseph Ten Eyck	Joe.Ten Eyck@fire.ca.gov	419-4406	CAL FIRE, ECC
Scott French	Scott.French@fire.ca.gov	419-4141	Cal Fire Arnold
BILL WENNHOLD	firedog5@goldrush.com	754-2961	MARK TWAIN HOSPITAL
Joyce Techel	Kennelnut@att.net	772-1463	Calaveras Planning Coalition Community Action Project

Foster Morrison

SIGN-IN SHEET
Calaveras County
LOCAL HAZARD MITIGATION PLAN UPDATE PROJECT
HMPC Kickoff Meeting #1
March 18, 2015

Name/Title	Email Address	Phone	City/Organization/ Affiliation
TERESA TANAKA	teresat@ccwd.org	(209) 754-3306	Calaveras County Water District

Sherri Munson

Subject:	Hazard Mitigation Meeting
Location:	Community Training Room, Calaveras County Sheriff's Office, 1045 Jeff Tuttle Drive, San Andreas, CA 95249
Start:	Wed 7/15/2015 9:00 AM
End:	Wed 7/15/2015 12:00 PM
Recurrence:	(none)
Meeting Status:	Meeting organizer
Organizer:	Sherri Munson
Required Attendees:	'Todd Fordahl'; Wade Whitney; 'Bill Perley'; Doug Polzoni; 'coa@angelscamp.gov'; Kevin Wright2; Nick Casci; Joe Ten Eyck; Jim Macedo; Robert Pachinger; Karl Benson; Dennis Huberty; Brian Moss; Shirley Ryan; Scott Anderson; 'Teresa Tanaka'; 'Mike Johnson'; Jeff Millar ; Jason Boetzer; 'Chris Bennett'; 'Andy Murphy'; Preston T Brown; Michelle Mead; Mary Sawicki; Thomas Reeves; Henning Schreiber; Mario Hernandez; Jeffrey Crovitz; 'Mike Blankenheim'; Sal Holcomb ; 'stevenflaigg@angelscamp.gov'; Scott Fremd; Dana Ellis; John Lawless; 'Roy Evans'; 'Dennis Lewis'; Gary Kuntz; 'Mike Muehlbauer'; Jeff White; Sherry Moranz; Steve Kovacs; Christopher Hewitt; Debbie Calcote; Donna Leatherman; 'Dave Baugher'; Zachariah Collom; Josh White; 'Dewayne Lewis'; Jeanine Foster
Optional Attendees:	'Reeves, Thomas'; 'mabrown@caltel.com'; Dean Friedli; 'Gary Ghio'

All,

Our next meetings for the Local Hazard Mitigation Plan Update have been set for **July 15th and 16th**, from 9-12 am each day in the Community Training Room located at the Calaveras County Sheriff's Office at 1045 Jeff Tuttle Drive, San Andreas, CA 95249.

Below is a brief description of the meetings.

Risk Assessment/Goal Meeting:
HMPC Meeting #2 is where the results of the Risk Assessment Task will be presented. The Risk Assessment is comprised of the Hazard Identification and Profiles, Vulnerability Assessment, and Capability Assessment. We will review maps and tables and how the risk and vulnerability to specific hazards varies across he planning area and from jurisdiction to jurisdiction. We will discuss outstanding data needs and how to get final input for the County and City of Angels. We will also start with the update of the Plan Goals and Objectives. Meeting time is 3 hours.

Mitigation Strategy Development:
HMPC Meetings #3 is for the mitigation strategy development. This meeting will include finalization of updated plan goals and objectives and identification of mitigation actions for each priority hazard. This will include prioritization of identified mitigation actions and an overview on development of implementation worksheets for all mitigation action items. Meeting time is 3 hours.

For these meetings, it is very important that we have the right people attending from each participating jurisdiction. Specifically, the county and city should have their public works/facilities people well represented, including staff and outside agencies involved with wildfire and flood projects . Anyone with projects to address the priority hazards for the plan should be attending both of these meetings. Priority Hazards include:

1

- Agricultural Hazards
- Dam Failure
- Drought and Water Shortage
- Earthquake
- Flood: 100-500-year
- Flood: Localized Flooding
- Severe Weather: Heavy Rain and Storms
- Severe Weather: Wind (includes tornadoes)
- Severe Weather: Winter Storms and Extreme Cold
- Wildfire

Please put these important dates on your calendar.

Sherri Munson

Subject:	Hazard Mitigation Meeting
Location:	Community Training Room, Calaveras County Sheriff's Office, 1045 Jeff Tuttle Drive, San Andreas, CA 95249
Start:	Thu 7/16/2015 9:00 AM
End:	Thu 7/16/2015 12:00 PM
Recurrence:	(none)
Meeting Status:	Meeting organizer
Organizer:	Sherri Munson
Required Attendees:	'Todd Fordahl'; Jeff White; Dean Friedli; Jeff Millar ; 'stevenflaigg@angelscamp.gov'; Doug Polzoni; Bill Fullerton; Steve Kovacs; Shirley Ryan; 'Mike Johnson'; 'Dewayne Lewis'; 'Dennis Lewis'; 'Bill Perley'; Brian Moss; Henning Schreiber; Mary Sawicki; Dana Ellis; Sal Holcomb ; Donna Leatherman; Jeanine Foster ; 'Chris Bennett'; Mario Hernandez; Jeffrey Crovitz; 'Colleen Haerr'; Sherry Moranz; 'Reeves, Thomas'; 'David Myers'; 'jrobitaille@calcofire.org'; Wade Whitney; 'Gary Ghio'; Josh White; 'Mike Blankenheim'; Dennis Huberty; 'Mike Muehlbauer'; Robert Pachinger; Debbie Calcote; 'Roy Evans'; Tim Tate; 'Andy Murphy'; Kevin Wright2; Jason Boetzer; Nick Casci; John Lawless; Scott Anderson; 'Teresa Tanaka'; Joe Ten Eyck; 'Dave Baugher'; 'mabrown@caltel.com'; Scott Fremd; Thomas Reeves

All,

THIS IS A REMINDER FOR TOMORROWS MEETING.

Our next meetings for the Local Hazard Mitigation Plan Update have been set for **July 15th and 16th**, from 9-12 am each day in the Community Training Room located at the Calaveras County Sheriff's Office at 1045 Jeff Tuttle Drive, San Andreas, CA 95249.

Below is a brief description of the meetings.

Risk Assessment/Goal Meeting:
HMPC Meeting #2 is where the results of the Risk Assessment Task will be presented. The Risk Assessment is comprised of the Hazard Identification and Profiles, Vulnerability Assessment, and Capability Assessment. We will review maps and tables and how the risk and vulnerability to specific hazards varies across he planning area and from jurisdiction to jurisdiction. We will discuss outstanding data needs and how to get final input for the County and City of Angels. We will also start with the update of the Plan Goals and Objectives. Meeting time is 3 hours.

Mitigation Strategy Development:
HMPC Meetings #3 is for the mitigation strategy development. This meeting will include finalization of updated plan goals and objectives and identification of mitigation actions for each priority hazard. This will include prioritization of identified mitigation actions and an overview on development of implementation worksheets for all mitigation action items. Meeting time is 3 hours.

For these meetings, it is very important that we have the right people attending from each participating jurisdiction. Specifically, the county and city should have their public works/facilities people well represented, including staff and

1

outside agencies involved with wildfire and flood projects . Anyone with projects to address the priority hazards for the plan should be attending both of these meetings. Priority Hazards include:

- Agricultural Hazards
- Dam Failure
- Drought and Water Shortage
- Earthquake
- Flood: 100-500-year
- Flood: Localized Flooding
- Severe Weather: Heavy Rain and Storms
- Severe Weather: Wind (includes tornadoes)
- Severe Weather: Winter Storms and Extreme Cold
- Wildfire

Please put these important dates on your calendar.

AGENDA

Calaveras County
Local Hazard Mitigation Plan (LHMP) Update
Kickoff Meeting: July 15 and 16, 2015

HMPC Meeting #2: July 15, 2015

1. Introductions
2. Status of the DMA Planning Process
3. Review of Risk Assessment
4. Develop Plan Goals and Objectives
5. Review of Mitigation Alternatives

HMPC Meeting #3: July 16, 2015

1. Identify Mitigation Projects
2. Review Mitigation Selection Criteria
3. Prioritize Mitigation Projects
4. Review of Schedule/Data Needs

2015 HAZARD MITIGATION PLAN UPDATE
RISK ASSESSMENT/GOAL MEETING
SIGN IN SHEET
7/15/2015

Name	Org.	Cell	Work	Email
Sherri Munson	CCSO / OES	559-7918	754-2888	smunson@co.calaveras.ca.us
David Bahr	CPUD		754-1824	d.bahr@wgamc.net
WADE WHITNEY	CCSO	770-6528	754-2895	WWhitney@CO.Calaveras.CA.US
JEFF MILLAR	PG+E	662-2015		JN19@PGE.COM
JEFF WHITE	BLDG. DEPT.	768-2517	754-6390	JWhite@Co.Calaveras.Ca.US
Shirley Ryan	Co. Admin	986-7470	754-6304	SRyan@Co.Calaveras.CA.US
Brian moss	Env. mgmt	768-4874	754-6378	bmoss@co.calaveras.ca.us
Cori Moon	Air Pollution Control	768-1907	754-6588	cmoon@ " " " "
Henning Schreiber	Animal Services	754-6509	754-6509	hschreiber@ " " "
Zachariah Collom	P.W. Facilities		754-6633	zcollom@co.calaveras.ca.us
Dennis Lewis	Red Cross + CERT	712-3120	—	dennis.lewis@redcross.org
John Lawless	Health + Hum Ser	754-6528		jlawless@co.calaveras.ca.us
Kevin Wright	AG	—	754-6504	KWright@Co. " " "
COLLEEN HAERR	C/ANGELS	736-2181		COLLEENHAERR@ANGELSCAMP.GOV
MARY SAWICKI	HEALTH & HUMAN SERVICES	2076991	7546445	MSAWICKI@CO.CALAVERAS.CA.US
Debbie Calcote-DPM	American Red Cross	209-346-1854	209-523-6451	debbie.calcote@redcross.org
TODD FORDAM	ANGELS CAMP PD	352-7078	7362967	TODDFORDAM@ANGELSCAMP.GOV

2015 HAZARD MITIGATION PLAN UPDATE
MITIGATION STRATEGY DEVELOPMENT
SIGN IN SHEET
7/16/2015

Name	Org.	Cell	Work	Email
Sherri Munson	CCSO / OES	559-9918	754-2888	smunson@co.calaveras.ca.us
Jeanine Foster	Foster Morrison	831 717-7171	same	jeanine.foster@fostermorrison.co
WADE WHITNEY	CCSO	770-6528	754-2785	wwhitney@co.calaveras.ca.us
Peter Martin	CCWD		754-3094	peterm@ccwd.org
JEFF MILLAR	PG+E	662-2015		JN19 @ PGE.COM
Zachariah Collom	P.W. Facilities Comdy		754 6633	zcollom@co.calaveras.ca.us
DAN NYGREN	CC Bldg Dept		754-6390	dnygren@co.calaveras.ca.us
Cori Moody	Calaveras APCD		754-6588	Cmoody@ " " " "
Bill Fullerton	Fire Safe Council	768-8786	293-7000	billfullerton@sbcglobal.net
Jason Robitaille	Calaveras Consolidated Cal-Co Fire	663-8907	786-2227	jrobitaille@calcofire.org
DENNIS HUBERTY	CCSO / OES	770-6540	754-6492	dhuberty@co.calaveras.ca.us
Henning Schreiber	Animal Services		754-6509	hschreiber@co.calaveras.ca.us
Dennis Lewis	Red Cross / CERT	712-3170		dennis.lewis@redcross.org
Kevin Wright	BS & Commissioner		754-6505	kwright2@co.calaveras.ca.us
John Lawless	Health + Human Ser		754-6528	jlawless@co.calaveras.ca.us
Dana Ellis	Cal OES	916 2058920	n/a	dana.ellis@caloes.ca.gov
MARY SAWICKI	Health + Human Services	2092176991	7546445	MSAWICKI@co.calaveras.ca.us
CLIFF EDSON	Calaveras County BOS	209-617-8587	same	cedson@co.calaveras.ca.us
Mike Blankenheim	CALFIRE	209 419 4413	same	mike.blankenheim@fire.ca.gov

Press Release for Public Comments on Final Draft

January 12, 2016

FOR IMMEDIATE RELEASE

CONTACT: Calaveras County Administrative Office, 209-754-6025

PUBLIC SERVICE ANNOUNCEMENT: CALAVERAS COUNTY INVITES PUBLIC INPUT TO LOCAL HAZARD MITIGATION PLAN UPDATE

Nationwide, taxpayers pay billions of dollars annually helping communities, organizations, businesses, and individuals recover from disaster. Some disasters are predictable and, in many cases, much of the damage can be reduced or even eliminated. The Federal Emergency Management Agency (FEMA) has targeted natural disaster loss reduction as one of its primary goals. The Disaster Mitigation Act of 2000 requires local governments to have a FEMA-approved Local Hazard Mitigation Plan (LHMP) to maintain eligibility for certain disaster assistance and hazard mitigation funding programs.

Calaveras County is the lead agency for the 2015 LHMP Update. The purpose of this LHMP Update is to assess risk to natural hazards such as wildfires, floods, drought, and other severe weather events; implement actions to reduce future losses; and maintain eligibility for federal mitigation funds in accordance with the Disaster Mitigation Act of 2000. Partnering with the County in this planning effort is the City of Angels Camp.

This process began in March of 2015 with public and planning team meetings and the establishment of a planning committee comprised of representatives from various local, state, and federal agencies. The public review draft is now available and includes an updated natural hazard risk assessment and mitigation strategy. Calaveras County and the City of Angels Camp would like your input on the draft plan. The plan is available on the County website at http://calaverasgov.us/ .

For more information on this project and to provide input on the draft plan contact The County Administrative Office at 209-754-6025.

Appendix B References

American Red Cross.

Arnold Community Plan. 1998.

Avery Pines Community Plan. 1998.

Calaveras County Agricultural Commission Annual Reports.

Calaveras County Community Wildfire Protection Plan. 2011.

Calaveras County Emergency Operations Plan Draft. 2015.

Calaveras County Flood Insurance Study. December 17, 2010.

Calaveras County General Plan Draft. 2014.

Calaveras County General Plan Background Report. 2014.

California Department of Finance.

California Department of Fish and Game.

California Department of Forestry and Fire Protection.

California Department of Parks and Recreation Office of Historic Preservation.

California Department of Water Resources.

California Drought Contingency Plan.

California Office of Emergency Services.

California Environmental Quality Act.

California Geological Survey.

California Historical Landmarks.

California Natural Diversity Database.

California Points of Historical Interest.

California Register of Historic Places.

California Volcanoes and Volcanics. U.S. Geological Survey, Cascades Volcano Observatory.

Central Valley Flood Control Project.

Census 2010. U.S. Census Bureau.

Cities/Counties Ranked by Size, Numeric, and Percent Change. State of California Department of Finance. 2014.

City of Angels Camp General Plan.

Communities at Risk. California Fire Alliance.

Community Rating System. Federal Emergency Management Agency National Flood Insurance Program.

Contingency Plan for Excessive Heat Emergencies – A Supporting Document to the State Emergency Plan, April 2010.

Developing the Mitigation Plan: Identifying Mitigation Actions and Implementation Strategies. Federal Emergency Management Agency. FEMA 386-3. 2003.

Ebbets Pass Special Plan. 1988.

Enhanced Fujita Scale. National Oceanic and Atmospheric Administration Storm Prediction Center. 2007.

Farm Service Agency.

Federal Emergency Management Agency.

FEMA Region IX.

Future Eruptions in California's Long Valley Area—What's Likely? U.S. Geological Survey. Fact Sheet 073-97. 1997.

Getting Started: Building Support for Mitigation Planning. Federal Emergency Management Agency. FEMA 386-1. 2002.

Hazard Mitigation Planning and Hazard Mitigation Grant Program. Federal Register. Interim Final Rule. February 26, 2002.

HAZUS-MH 2.1. Federal Emergency Management Agency. 2012.

Integrating Manmade Hazards into Mitigation Planning. Federal Emergency Management Agency. FEMA 386-7. 2003.

Introduction to Hazard Mitigation. Federal Emergency Management Agency. FEMA IS-393.A. 2006.

Levee Flood Protection Zones – Sacramento River Basin.

The Library of Congress, American Memory.

Mokelumne Hill Community Plan. 1988.

Multi-Hazard Identification and Risk Assessment. Federal Emergency Management Agency. 1997.

Murphy's Community Plan. 1998.

National Climatic Data Center Storm Events Database.

National Flood Insurance Program. Federal Emergency Management Agency. /

Natural Hazard Mitigation Saves: An Independent Study to Assess the Future Savings from Mitigation Activities. National Institute of Building Science Multi-Hazard Mitigation Council. 2005.

National Institute of Building Science Multi-Hazard Mitigation Council.

National Inventory of Dams.

National Levee Database.

National Oceanic and Atmospheric Administration National Climatic Data Center.

National Performance of Dams Program.

National Register Information System.

National Register of Historic Places.

National Resource Conservation Service.

National Response Center.

National Weather Service.

Oak Canyon Ranch Special Plan. 2008.

The Online Tornado FAQ. National Oceanic and Atmospheric Administration Storm Prediction Center.

Original Fujita Scale. National Oceanic and Atmospheric Administration Storm Prediction Center.

Pipeline and Hazardous Materials Safety Administration Incident Reports Database Search

Probabilistic Seismic Hazard Assessment for the State of California. California Geological Survey. Open-File Report 96-08. 1996.

Rancho Calaveras Special Plan. 1999.

Robert T. Stafford Disaster Relief and Emergency Act. Public Law 93-288, as amended, 42 U.S.C. 5121-5207. June 2007.

Saddle Creek Special Plan. 2008.

San Andreas Community Plan. 1988.

Spatial Hazard Events and Losses Database for the United States. University of South Carolina Hazards Research Lab.

State of California Department of Conservation Farmland Mapping and Monitoring Program.

State of California Multi-Hazard Mitigation Plan. California Emergency Management Agency. 2013.

Strategic Fire Plan Tuolumne-Calaveras Unit. 2014.

Tuolumne-Calaveras Unit Pre-Fire Management Plan. 2009.

Understanding Your Risks: Identifying Hazards and Estimating Losses. Federal Emergency Management Agency. FEMA 386-2. 2001.

U.S. Army Corps of Engineers.

U.S. Bureau of Land Management.

U.S. Center for Disease Protection.

U.S. Department of Agriculture Census of Agriculture.

U.S. Department of Agriculture Secretarial Disaster Declarations.

U.S. Drought Monitor. University of Nebraska-Lincoln National Drought Mitigation Center.

U.S. Drought Impact Reporter.

U.S. Fish and Wildlife Service Sacramento Office.

U.S. Forestry Service

U.S. Geological Survey.

Valley Springs Community Plan. 1974.

Western Regional Climate Center.

Appendix D Adoption Resolutions

Note to Reviewers: When this plan has been reviewed and approved pending adoption by FEMA Region IX, the adoption resolutions will be signed by the participating jurisdictions and added to this appendix. A model resolution is provided below:

Resolution # _____

Adopting the Calaveras County Local Hazard Mitigation Plan

Whereas, (Name of Government/District/Organization seeking FEMA approval of hazard mitigation plan) recognizes the threat that natural hazards pose to people and property within our community; and

Whereas, undertaking hazard mitigation actions will reduce the potential for harm to people and property from future hazard occurrences; and

Whereas, the U.S. Congress passed the Disaster Mitigation Act of 2000 emphasizing the need for pre-disaster mitigation of potential hazards;

Whereas, the Disaster Mitigation Act made available hazard mitigation grants to state and local governments;

Whereas, an adopted Local Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

Whereas, (Name of Government/District/Organization) fully participated in the FEMA-prescribed mitigation planning process to prepare this local hazard mitigation plan; and

Whereas, the California Office of Emergency Services and Federal Emergency Management Agency, Region IX officials have reviewed the Calaveras County Local Hazard Mitigation Plan and approved it contingent upon this official adoption of the participating governing body;

Whereas, the (Name of Government/District/Organization) desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts by formally adopting the Calaveras County Local Hazard Mitigation Plan;

Whereas, adoption by the governing body for the (Name of Government/District/Organization), demonstrates the jurisdiction's commitment to fulfilling the mitigation goals and objectives outlined in this Local Hazard Mitigation Plan.

Whereas, adoption of this legitimacies the plan and authorizes responsible agencies to carry out their responsibilities under the plan.

Now, therefore, be it resolved, that the (Name of Government/District/Organization) adopts the Calaveras County Local Hazard Mitigation Plan as an official plan; and

Be it resolved, that due to the recent disaster events, addenda will be developed and integrated into this Plan Update based on new data, mitigation needs and actions within 90 days of the Plan adoptions, and

Be it resolved, that the (Name of Government/District/Organization) adopts the Calaveras County Local Hazard 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, (Name of Government/District/Organization) 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 requirements of AB 2140.

Passed:_____
(date)

_____
Certifying Official

County Adoption

13

BOARD OF SUPERVISORS, COUNTY OF CALAVERAS
STATE OF CALIFORNIA
November 10, 2015

Resolution No. 20151110126

Resolution Adopting Local Hazard Mitigation Plan

WHEREAS, Calaveras County recognizes the threat that natural hazards pose to people and property within our community; and,

WHEREAS, undertaking hazard mitigation actions will reduce the potential for harm to people and property from future hazard occurrences; and,

WHEREAS, the U.S. Congress passed the Disaster Mitigation Act of 2000 emphasizing the need for pre-disaster mitigation of potential hazards; and,

WHEREAS, the Disaster Mitigation Act made available hazard mitigation grants to state and local governments; and,

WHEREAS, an adopted Local Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and,

WHEREAS, Calaveras County fully participated in the FEMA-prescribed mitigation planning process to prepare this local hazard mitigation plan; and,

WHEREAS, the California Office of Emergency Services and Federal Emergency Management Agency, Region IX officials have reviewed the Calaveras County Local Hazard Mitigation Plan and approved it contingent upon this official adoption of the participating governing body; and,

WHEREAS, Calaveras County desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts by formally adopting the Calaveras County Local Hazard Mitigation Plan; and,

WHEREAS, adoption by the governing body for Calaveras County, demonstrates the jurisdiction's commitment to fulfilling the mitigation goals and objectives outlined in this Local Hazard Mitigation Plan: and,

WHEREAS, adoption of this legitimacies the plan and authorizes responsible agencies to carry out their responsibilities under the plan.

NOW, THEREFORE, BE IT RESOLVED, that the County of Calaveras adopts the Calaveras County Local Hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED, that due to the recent disaster events, addenda will be developed and integrated into this Plan Update based on new data, mitigation needs and actions within 90 days of the Plan adoptions, and

BE IT FURTHER RESOLVED, that the County of Calaveras adopts the Calaveras County Local Hazard 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 County of Calaveras will submit this adoption resolution to the California Office of Emergency Services and FEMA Region IX officials to enable the plan's final

Packet Pg. 85

approval in accordance with the requirements of the Disaster Mitigation Act of 2000 and to establish conformance with the requirements of AB 2140.

ON A MOTION by Supervisor Wright seconded by Supervisor Ponte, the foregoing resolution was duly passed and adopted by the Board of Supervisors of the County of Calaveras, State of California this 10th day of November, 2015, by the following vote:

AYES:	Edson, Wright, Oliveira, Ponte, Kearney

Cliff Edson, Chair 11/10/2015

ATTEST

Karen Osborn 11/10/2015

Appendix E Wildfire History

CAL FIRE, USDA Forest Service Region 5, Bureau of Land Management (BLM), the National Park Service (NPS), Contract Counties and other agencies jointly maintain a comprehensive fire perimeter GIS layer for public and private lands throughout the state. The data covers fires back to 1878 (though the first recorded incident for the County was in 1917). For the National Park Service, Bureau of Land Management, and US Forest Service, fires of 10 acres and greater are reported. For CAL FIRE, timber fires greater than 10 acres, brush fires greater than 50 acres, grass fires greater than 300 acres, and fires that destroy three or more residential dwellings or commercial structures are reported. CAL FIRE recognizes the various federal, state, and local agencies that have contributed to this dataset, including USDA Forest Service Region 5, BLM, National Park Service, and numerous local agencies.

Fires may be missing altogether or have missing or incorrect attribute data. Some fires may be missing because historical records were lost or damaged, fires were too small for the minimum cutoffs, documentation was inadequate, or fire perimeters have not yet been incorporated into the database. Also, agencies are at different stages of participation. For these reasons, the data should not be used for statistical or analytical purposes.

The data provides a reasonable view of the spatial distribution of past large fires in California. Using GIS, fire perimeters that intersect Calaveras County were extracted and are listed in Table E-1.

Table E-1 Calaveras County Wildfire History

Cause	Fire/Treatment Name	Year	Acres
Lightning	Cold Ck Fire	1917	992
Lightning	Bear River Fire	1918	1,748
Unknown / Unidentified	Gold Bug	1923	510
Unknown / Unidentified	Dogtown #2	1950	130
Unknown / Unidentified	Murphy #2	1950	153
Unknown / Unidentified	Pool	1950	345
Unknown / Unidentified	Riley	1950	366
Unknown / Unidentified	Three Corners	1950	383
Unknown / Unidentified	San Antone	1950	407
Unknown / Unidentified	Lombardi	1950	446
Unknown / Unidentified	Angels Creek	1950	495
Unknown / Unidentified	Six Mile Creek	1950	541
Unknown / Unidentified	Frecerro	1950	1,652
Unknown / Unidentified	Carson Flat	1950	2,660
Lightning	Mill Creek	1951	38
Smoking	Smith Road	1951	629

Cause	Fire/Treatment Name	Year	Acres
Unknown / Unidentified	Deyoung	1951	526
Unknown / Unidentified	Camp Nine	1951	1,400
Unknown / Unidentified	Burson	1951	2,628
Equipment Use	Associated	1952	22
Unknown / Unidentified	Rolleri #4	1952	317
Unknown / Unidentified	Rolleri #2	1952	508
Unknown / Unidentified	Indian Creek	1952	580
Unknown / Unidentified	Guttinger	1952	599
Unknown / Unidentified	Murray Creek	1952	907
Unknown / Unidentified	Jenny Lind	1952	928
Unknown / Unidentified	Highway 49 #5	1952	1,117
Unknown / Unidentified	Calaveritas	1952	1,259
Unknown / Unidentified	Swiss	1952	1,361
Unknown / Unidentified	Dog Town	1952	2,301
Lightning	Shovel Grave	1953	11
Lightning	Hayward Creek	1953	31
Smoking	San Domingo	1953	14
Unknown / Unidentified	Indian Creek	1953	331
Unknown / Unidentified	High Mtn.	1953	556
Unknown / Unidentified	P.G.&E. #4	1953	797
Unknown / Unidentified	Dell Orto Escape	1954	380
Unknown / Unidentified	Zwinge	1954	437
Unknown / Unidentified	Camp Nine	1954	900
Unknown / Unidentified	Rolleri	1955	240
Unknown / Unidentified	Lombardi	1955	265
Unknown / Unidentified	Oneil Creek	1955	318
Unknown / Unidentified	Comanche	1955	431
Unknown / Unidentified		1956	160
Unknown / Unidentified	San Antonio	1956	264
Unknown / Unidentified	Sheepranch	1956	579
Unknown / Unidentified	Mitchell	1957	327
Unknown / Unidentified	Clinton Trail	1957	666
Unknown / Unidentified	Mitchell	1957	817
Unknown / Unidentified	Old Gulch	1957	874
Debris	Miller	1958	42
Unknown / Unidentified	Stearman	1958	777
Unknown / Unidentified	Tiscornia Escape	1958	1,246

Cause	Fire/Treatment Name	Year	Acres
Unknown / Unidentified	Hiway 4 #5	1958	4,747
Arson	Black Wonder	1959	12
Unknown / Unidentified	San Antonio	1959	344
Unknown/Unidentified	Forest Creek	1959	528
Unknown / Unidentified	Meyer	1960	3,801
Debris	Gold King	1961	131
Miscellaneous	Camp #9	1961	48
Unknown / Unidentified	Hunt	1961	293
Unknown / Unidentified	Garland	1961	576
Unknown / Unidentified	Prothers	1962	294
Unknown / Unidentified	O'byrnes Ferry Road1	1962	1,257
Debris	PG&E #5	1963	68
Unknown / Unidentified	Mexican Gulch #2	1964	392
Unknown / Unidentified	P.G. & E. #3	1965	1,570
Debris	San Antonio	1966	200
Smoking	Cowell Creek	1966	177
Unknown / Unidentified	Hoag	1966	281
Unknown / Unidentified	Lombardi	1966	290
Unknown / Unidentified	Podesta	1966	343
Unknown / Unidentified	Indian Creek	1966	430
Unknown / Unidentified	Milton	1966	2,678
Unknown / Unidentified	Tiscornia #3	1967	1,677
Unknown / Unidentified	Lakeview	1968	162
Unknown / Unidentified	Stone Corral	1968	186
Unknown / Unidentified	Coyote Creek	1968	610
Unknown / Unidentified	Cave City	1968	630
Unknown / Unidentified	Burns	1968	1,422
Arson	North Fork	1969	50
Unknown / Unidentified	Red Hills	1969	232
Unknown / Unidentified	Highway 4	1969	408
Unknown / Unidentified	U3-Ranch	1970	447
Arson	Silver Mtn.	1971	112
Unknown / Unidentified	New Hogan	1971	575
Unknown / Unidentified	Blue Jay	1972	168
Unknown / Unidentified	Chili Gulch	1972	1,118
Unknown / Unidentified	Snow Ranch	1972	1,266
Campfire	Oxedine	1974	3

Cause	Fire/Treatment Name	Year	Acres
Debris	Buck	1976	5
Unknown / Unidentified	Mountain Pass	1979	58
Unknown / Unidentified	Golden Gate	1979	1,116
Unknown / Unidentified	Brunswick	1979	1,353
Unknown / Unidentified	Fowler Peak	1979	5,237
Unknown / Unidentified	Red Hill	1980	95
Debris	Griffith	1982	4
Unknown / Unidentified	Gregory	1983	271
Equipment Use	Summit	1985	176
Unknown / Unidentified	Huckleberry	1985	459
Unknown / Unidentified	Gann	1985	1,004
Debris	Cabbage	1986	21
Miscellaneous	Hunt	1986	410
Lightning	Moore	1987	23
Smoking	Doud	1987	7
Arson	Highway	1988	260
Arson	Mason	1988	4,050
Arson	Bridge	1988	6,374
Arson	Bridge	1988	6,690
Campfire	Boards	1988	27
Equipment Use	Grade	1988	375
Lightning	Moke	1988	36
Miscellaneous	Pardee	1988	1,209
Unknown / Unidentified	Hwy 26 #3	1989	390
Unknown / Unidentified	Loma Fire	1989	449
Debris	Moore	1991	59
Equipment Use	Parrots 2	1992	105
Equipment Use	Haibach	1992	443
Miscellaneous	Sparks	1992	349
Unknown / Unidentified	Fricot	1992	264
Vehicle	Gulch Fire	1992	17,419
Debris	Mckay	1993	18
Vehicle	Copper #3	1994	277
Vehicle	Copper #1	1994	1,143
Vehicle	Copper #8	1994	1,914
Miscellaneous	Murray	1995	272
Debris	Frecot	1996	63

Cause	Fire/Treatment Name	Year	Acres
Equipment Use	Canyon	1996	144
Lightning	Manual	1996	378
Lightning	Manual	1996	378
Lightning	Lightning #12	1996	1,141
Lightning	Lightning #14	1996	2,647
Arson	Melones #5	1999	55
Arson	Myrtle	1999	317
Lightning	Lightning #31	1999	114
Powerline	PG&E #17	1999	107
Powerline	PG&E #16	1999	205
Arson	Paloma	2000	210
Debris	Harley	2000	158
Debris	Harley	2000	158
Equipment Use	Parrotts	2000	289
Miscellaneous	Hwy 49 #7	2000	68
Campfire	Hogan	2001	162
Campfire	Moore	2001	579
Equipment Use	Leonard	2001	5,188
Miscellaneous	Lake	2001	773
Unknown / Unidentified	Darby	2001	14,281
Debris	SPI #9	2002	11
Debris	SPI #6 "Spur 4"	2002	36
Debris	SPI #12 "Mill Creek #2"	2002	36
Debris	SPI #5 "Winton"	2002	39
Debris	SPI #4 "Mill Creek #1"	2002	53
Debris	SPI #3 "Sourgrass"	2002	635
Equipment Use	Willow	2002	166
Equipment Use	PG&E#1	2002	266
Unknown / Unidentified	Valley	2002	12
Unknown / Unidentified	Valley	2002	12
Vehicle	Manuel	2002	10
Vehicle	Manuel	2002	10
Vehicle	Howell	2002	80
Equipment Use	Turner	2003	12
Equipment Use	Turchet	2003	53
Equipment Use	Pitman	2003	67
Equipment Use	Chuckwagon	2003	82

Cause	Fire/Treatment Name	Year	Acres
Equipment Use	Hwy 26 #2	2003	101
Unknown / Unidentified	Medina	2003	0
Vehicle	Highway	2003	142
Arson	Double	2004	69
Arson	Armstrong #1	2004	87
Arson	Armstrong #2	2004	879
Campfire	Moke	2004	354
Debris	Kardas	2004	8
Debris	Highway	2004	63
Equipment Use	Hunt	2004	490
Equipment Use	Power	2004	16,983
Powerline	PG&E #11	2004	193
Vehicle	Pattison	2004	2,483
Vehicle	Hwy 4 #2	2004	3,445
Equipment Use	Carson	2005	12
Powerline	PG&E #7	2005	59
Powerline	Penn	2005	61
Powerline	PG&E #15	2005	146
Debris	Stinson	2006	52
Equipment Use	Horseshoe	2006	53
Equipment Use	Jenson	2006	150
Equipment Use	Ponte	2006	194
Unknown / Unidentified	Milton	2006	228
Debris	Murray	2007	103
Equipment Use	Dome2	2007	138
Equipment Use	Dunton	2007	208
Unknown / Unidentified	Gassner	2007	229
Vehicle	Golden	2007	66
Debris	Prussian 2	2008	36
Lightning	Smitty	2008	20
Railroad	Evans	2008	104
Vehicle	Pool 2 - Main	2008	73
Lightning	Telegraph	2009	162
Miscellaneous	Rock	2009	409
Arson	Freccero	2011	57
Debris	East	2011	3
Debris	Blue	2011	14

Cause	Fire/Treatment Name	Year	Acres
Debris	Blue	2011	20
Debris	Blue	2011	21
Debris	Blue	2011	28
Debris	Blue	2011	28
Debris	Blue	2011	34
Debris	Blue	2011	35
Debris	East	2011	42
Debris	Blue	2011	79
Debris	Blue	2011	439
Equipment Use	Murray	2011	0
Equipment Use	Murray	2011	0
Equipment Use	Murray	2011	5
Equipment Use	Murray	2011	66
Equipment Use	Middle	2011	97
Campfire	Ramsey	2012	1,137
Equipment Use	Penn	2012	134
Lightning	Gopher	2012	70
Unknown / Unidentified	Horseshoe	2012	96
Unknown / Unidentified	Farris	2013	11
Unknown / Unidentified	Bridge	2013	46

Source: Cal Fire, USDA, BLM, NPS

Appendix F Critical Facilities

Table F-1 Calaveras County Critical Facility Detail Table

Jurisdiction	Critical Facility Designation	Type	Name	Address	Flood Zone	Fire Threat
Calaveras County Unincorporated Areas	At Risk Population Facilities	Congregate Care Facility	Faith Lutheran Church	65 Mitchler St	X	Very High
Calaveras County Unincorporated Areas	At Risk Population Facilities	Congregate Care Facility	Country Haven	556 Toyon Dr	X	High
Calaveras County Unincorporated Areas	At Risk Population Facilities	Congregate Care Facility	Calaveras Senior Center	956 Mountain Ranch Rd	X	Moderate
Calaveras County Unincorporated Areas	Essential Services and At Risk Facilities	School / Emergency Shelter	Copper Cove High School	19 Copper Dr.	X	High
Calaveras County Unincorporated Areas	Essential Services and At Risk Facilities	School / Emergency Shelter	Copperopolis Elementary	217 School St	X	High
Calaveras County Unincorporated Areas	Essential Services and At Risk Facilities	School / Emergency Shelter	Copperopolis Elementary K-6	217 School Street	X	High
Calaveras County Unincorporated Areas	Essential Services and At Risk Facilities	School / Emergency Shelter	Vallecito High School	3670 Church St	X	Very High
Calaveras County Unincorporated Areas	Essential Services and At Risk Facilities	School / Emergency Shelter	Jenny Lind Alternative 9-12	11618 School Street	X	High
Calaveras County Unincorporated Areas	Essential Services and At Risk Facilities	School / Emergency Shelter	Albert Michelson Elementary	196 Pennsylvania Gulch	X	Very High

Jurisdiction	Critical Facility Designation	Type	Name	Address	Flood Zone	Fire Threat
Calaveras County Unincorporated Areas	Essential Services and At Risk Facilities	School / Emergency Shelter	Resource Connection	196 Pennsylvania Gulch Rd	X	Very High
Calaveras County Unincorporated Areas	Essential Services and At Risk Facilities	School / Emergency Shelter	Home School Academy	196 Pennsylvania Gulch Rd	X	Very High
Calaveras County Unincorporated Areas	Essential Services and At Risk Facilities	School / Emergency Shelter	Albert Michelson Elementary K-5	196 Pennsylvania Gulch Rd	X	Very High
Calaveras County Unincorporated Areas	Essential Services and At Risk Facilities	School / Emergency Shelter	Jenny Lind Elementary	5100 Driver Rd	X	High
Calaveras County Unincorporated Areas	Essential Services and At Risk Facilities	School / Emergency Shelter	Jenny Lind Elementary K-6	5100 Driver Rd	X	High
Calaveras County Unincorporated Areas	Essential Services and At Risk Facilities	School / Emergency Shelter	Early Head Start	30 Vista Del Lago Dr	X	High
Calaveras County Unincorporated Areas	Essential Services and At Risk Facilities	School / Emergency Shelter	Rite of Passage -ATCS	10400 Fricot City Rd	X	Very High
Calaveras County Unincorporated Areas	Essential Services and At Risk Facilities	School / Emergency Shelter	Mountain Oaks School	924 Church Hill Rd Unit B1&B2	X	High
Calaveras County Unincorporated Areas	Essential Services and At Risk Facilities	School / Emergency Shelter	The Resource Connection	444 E St Charles St	X	High
Calaveras County Unincorporated Areas	Essential Services and At Risk Facilities	School / Emergency Shelter	Valley Springs Elementary	240 Pine St	X	Moderate
Calaveras County Unincorporated Areas	Essential Services and At Risk Facilities	School / Emergency Shelter	Valley Springs Elementary K-6	240 Pine St	X	Moderate

Jurisdiction	Critical Facility Designation	Type	Name	Address	Flood Zone	Fire Threat
Calaveras County Unincorporated Areas	Essential Services and At Risk Facilities	School / Emergency Shelter	Calaveras Head Start	PO Box 919	X	High
Calaveras County Unincorporated Areas	Essential Services and At Risk Facilities	School / Emergency Shelter	Transition Program	255 Lewis Av	X	Very High
Calaveras County Unincorporated Areas	Essential Services and At Risk Facilities	School / Emergency Shelter	San Andreas Elementary K-6	255 Lewis Av	X	Very High
Calaveras County Unincorporated Areas	Essential Services and At Risk Facilities	School / Emergency Shelter	San Andreas Elementary	255 Lewis Av	X	Very High
Calaveras County Unincorporated Areas	Essential Services and At Risk Facilities	School / Emergency Shelter	Calaveras High School Grade 9-12	350 High School St	X	Very High
Calaveras County Unincorporated Areas	Essential Services and At Risk Facilities	School / Emergency Shelter	Calaveras High	350 High School St	X	Very High
Calaveras County Unincorporated Areas	Essential Services and At Risk Facilities	School / Emergency Shelter	Sierra Hills Education Center	501 Gold Strike Rd	X	High
Calaveras County Unincorporated Areas	Essential Services and At Risk Facilities	School / Emergency Shelter	Gold Strike High School 10-12	501 Gold Strike Rd	X	High
Calaveras County Unincorporated Areas	Essential Services and At Risk Facilities	School / Emergency Shelter	Avery Middle School	4545 Moran Rd	X	Very High
Calaveras County Unincorporated Areas	Essential Services and At Risk Facilities	School / Emergency Shelter	Avery Middle School Grade 6-8	4545 Moran Rd	X	Very High
Calaveras County Unincorporated Areas	Essential Services and At Risk Facilities	School / Emergency Shelter	Calaveras Unified School District	3304 Hwy 12 Bldg.B	X	High

Jurisdiction	Critical Facility Designation	Type	Name	Address	Flood Zone	Fire Threat
Calaveras County Unincorporated Areas	Essential Services and At Risk Facilities	School / Emergency Shelter	Toyon Middle School	3412 Double Springs Rd	X	High
Calaveras County Unincorporated Areas	Essential Services and At Risk Facilities	School / Emergency Shelter	Toyon Middle School Grade 7 & 8	3412 Double Springs Rd	X	High
Calaveras County Unincorporated Areas	Essential Services and At Risk Facilities	School / Emergency Shelter	Mountain Ranch Community School	3667 Whiskey Slide Rd	X	High
Calaveras County Unincorporated Areas	Essential Services and At Risk Facilities	School / Emergency Shelter	Oakendell Court School	3585 Hawver Road	X	Very High
Calaveras County Unincorporated Areas	Essential Services and At Risk Facilities	School / Emergency Shelter	Arnold High School	874 Henry Rd #4	X	Very High
Calaveras County Unincorporated Areas	Essential Services and At Risk Facilities	School / Emergency Shelter	Hazel Fischer Elementary	1605 Blagen Rd	X	Very High
Calaveras County Unincorporated Areas	Essential Services and At Risk Facilities	School / Emergency Shelter	Hazel Fisher Elementary K-5	1605 Blagen Rd	X	Very High
Calaveras County Unincorporated Areas	Essential Services and At Risk Facilities	School / Emergency Shelter	Community Day School	1605 Blagen Rd	X	Very High
Calaveras County Unincorporated Areas	Essential Services and At Risk Facilities	School / Emergency Shelter	Mokelume Hill Elementary K-6	8350 Highway 26	X	Very High
Calaveras County Unincorporated Areas	Essential Services and At Risk Facilities	School / Emergency Shelter	Mokelumne Hill Elementary	8350 Highway 26	X	Very High
Calaveras County Unincorporated Areas	Essential Services and At Risk Facilities	School / Emergency Shelter	Rail Road Flat Elementary	298 Rail Road Flat Rd	X	Very High

Jurisdiction	Critical Facility Designation	Type	Name	Address	Flood Zone	Fire Threat
Calaveras County Unincorporated Areas	Essential Services and At Risk Facilities	School / Emergency Shelter	Rail Road Flat Elementary K-6	298 Rail Road Flat Rd	X	Very High
Calaveras County Unincorporated Areas	Essential Services and At Risk Facilities	School / Emergency Shelter	West Point Alternative High 9-12	54 Bald Mountain Rd	X	High
Calaveras County Unincorporated Areas	Essential Services and At Risk Facilities	School / Emergency Shelter	West Point Elementary K-6	54 Bald Mountain Rd	X	High
Calaveras County Unincorporated Areas	Essential Services and At Risk Facilities	School / Emergency Shelter	West Point Elementary	54 Bald Mountain Rd	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Communications	Fowler Peak-L.O.	Stallion Wy	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Communications	CDF TCURPT 2	Riata Wy	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Communications	Ross Drive	Ross Dr	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Communications	Sheriffs Office	1045 Jeff Tuttle Dr	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Communications	Sierra Vista-L.O.	W. Murray Creek Rd	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Communications	Blue Mtn.-L.O.	06N04	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Community Food Bank/Pantry	Lake Tulloch Bible Church	3566 Spangler Lane	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Community Food Bank/Pantry	Stone Corral Community Church	9441 Hwy 26	X	Moderate
Calaveras County Unincorporated Areas	Essential Services Facilities	Community Food Bank/Pantry	Murphys Senior Center	65 Mitchler St	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Community Food Bank/Pantry	Good Samaritan Church	4684 Baldwin St	X	High

Jurisdiction	Critical Facility Designation	Type	Name	Address	Flood Zone	Fire Threat
Calaveras County Unincorporated Areas	Essential Services Facilities	Community Food Bank/Pantry	The Resource Connection Food Bank	206 George Reed Dr	A	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Community Food Bank/Pantry	Community United Methodist Church	135 Laurel St	X	Moderate
Calaveras County Unincorporated Areas	Essential Services Facilities	Community Food Bank/Pantry	Seventh Day Adventist Church	399 Oak Street	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Community Food Bank/Pantry	Mountain Ranch Resource Center	7867 Whiskey Slide Rd	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Community Food Bank/Pantry	Chapel in the Pines	2286 Cedar Lane	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Community Food Bank/Pantry	Our Lady of the Sierra	1301 Linebaugh Road	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Community Food Bank/Pantry	Mokelumne Hill Church	8085 Hwy 26 Suite 2B,	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Community Food Bank/Pantry	Community Covenant Church	22264 Highway 26	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Community Food Bank/Pantry	RCFB Mobile Pantry	22283 Highway 26	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Community Food Bank/Pantry	Blue Mountain Community Service	291 Main Street, Suite A	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Emergency Evacuation Shelter	Frog Town	101 Frogtown Rd	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Emergency Evacuation Shelter	Native Sons of the Golden West	389 Main St	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Emergency Evacuation Shelter	Masonic Temple	384 Church St	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Emergency Evacuation Shelter	First Congregational Chruch	509 N Algiers St	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Emergency Evacuation Shelter	Jenny Lind Memorial Hall	189 Pine St	X	Moderate

Jurisdiction	Critical Facility Designation	Type	Name	Address	Flood Zone	Fire Threat
Calaveras County Unincorporated Areas	Essential Services Facilities	Emergency Evacuation Shelter	Community Covenant Church	261 Treat St	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Emergency Evacuation Shelter	San Andreas Town Hall	24 Church Hill Rd	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Emergency Evacuation Shelter	Mt. Ranch Community Hall	8049 Washington St	A	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Emergency Evacuation Shelter	Mountain Ranch Youth Center	7869 Whiskey Slide Rd	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Emergency Evacuation Shelter	Community Church	8403 E. Murray Creek Rd	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Emergency Evacuation Shelter	Chapel In The Pines	2286 Cedar Lane	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Emergency Evacuation Shelter	Mountain Play School Indep Hall	1445 Blagen Rd	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Emergency Evacuation Shelter	Independence Hall	1445 Blagen Rd	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Emergency Evacuation Shelter	Ebbetts Pass Moose Lodge #1123	1965 Blagen Rd	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Emergency Evacuation Shelter	Community Town Hall	8283 Main St	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Emergency Evacuation Shelter	Rail Road Flat Community Hall	250 Rail Road Flat Rd	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Emergency Evacuation Shelter	American Legion Hall	2769 Dorray Rd	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Emergency Evacuation Shelter	Community Covenant Church	22264 Highway 26	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Emergency Evacuation Shelter	West Point Veterans Memorial Hall	22273 Highway 26	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Emergency Evacuation Shelter	West Point Community Hall	22283 Highway 26	X	High

Jurisdiction	Critical Facility Designation	Type	Name	Address	Flood Zone	Fire Threat
Calaveras County Unincorporated Areas	Essential Services Facilities	Emergency Evacuation Shelter	Blue Mountain Coalition	364 Main Street	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Emergency Evacuation Shelter	VFW Hall	202 Spink Rd	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Emergency Medical	American Legion Ambulance	265 E St Charles St	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Emergency Medical	American Legion Ambulance	191 E. Hwy 12	X	Moderate
Calaveras County Unincorporated Areas	Essential Services Facilities	Emergency Medical	American Legion Ambulance	396 W St. Charles	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Emergency Medical	American Legion Ambulance	405 Main St.	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Fire Station	Copperopolis Fire Department St2	1927 Quiver St	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Fire Station	Copperopolis Fire Department St1	370 Main St	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Fire Station	Copperopolis-CAL FIRE	433 Main St	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Fire Station	Copperopolis Fire Department St3	9164 Pool Station Rd	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Fire Station	Murphys Fire St2	3408 Main St	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Fire Station	Vallecito-CC	3235 Six Mile Rd	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Fire Station	Calaveras Consolidated St3	6501 Jenny Lind Rd	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Fire Station	Murphys Fire St1	37 Jones St	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Fire Station	MURPHYS-CAL FIRE	33 Apple Blossom Dr.	X	Very High

Jurisdiction	Critical Facility Designation	Type	Name	Address	Flood Zone	Fire Threat
Calaveras County Unincorporated Areas	Essential Services Facilities	Fire Station	Valley Springs-CAL FIRE	1855 New Hogan Parkway	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Fire Station	Calaveras Consolidated St1	3255 Helisma Rd	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Fire Station	USFS Hathaway Pines	5519 Hwy 4	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Fire Station	Tuolumne-Calveras\RUHQ	785 Mountain Ranch RD	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Fire Station	Ebbetts Pass Fire St 3	40 Canyon View Dr.	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Fire Station	Calaveras Consolidated St2	129 Hwy 12	X	Moderate
Calaveras County Unincorporated Areas	Essential Services Facilities	Fire Station	San Andreas Fire District St1	37 Church Hill Rd	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Fire Station	Central Calaveras Fire St 5	11309 Sheep Ranch Rd	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Fire Station	Central Calaveras Fire St 3	8041 Washington St	A	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Fire Station	Arnold-CAL FIRE	2517 Hwy 4	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Fire Station	Ebbetts Pass Fire St 4	2038 Moran Rd	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Fire Station	Esperanza-CAL FIRE	9740 Mountain Ranch Rd	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Fire Station	Ebbetts Pass Fire St 1	1037 Blagen Rd.	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Fire Station	Central Calaveras Fire St 2	6338 Swiss Ranch Rd	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Fire Station	Central Calaveras Fire St 1	19927 Jesus Maria Rd.	X	Very High

Jurisdiction	Critical Facility Designation	Type	Name	Address	Flood Zone	Fire Threat
Calaveras County Unincorporated Areas	Essential Services Facilities	Fire Station	Mokelumne Hill Fire Distrct St 1	8160 Church St	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Fire Station	Stanislaus NF Dorrington Fire	5200 Hwy 4	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Fire Station	Ebbetts Pass Fire St 2	5510 Meko Dr	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Fire Station	Central Calaveras Fire St 4	15815 Hwy 26	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Fire Station	SNF Calaveras District Office	3910 N. Railroad Flat Rd	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Fire Station	West Point Fire District St2	3910 Rail Road Flat Rd N	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Fire Station	West Point Fire District St1	195 Spink Rd	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Fire Station	West Point-Cal Fire	22670 Hwy 26	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Fire Station	Hermit Springs-Ffs	07N09	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Government Operations	Copperopolis Office	3505 Spangler Ln SUITE 405	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Government Operations	Jenny Lind Yard		X	Moderate
Calaveras County Unincorporated Areas	Essential Services Facilities	Government Operations	Calaveras Works @ Human Services	509 E St Charles St	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Government Operations	Public Health Office		X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Government Operations	Env Health Office	891 Mountain Ranch Rd	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Government Operations	Public Works Office	891 Mountain Ranch Rd	X	High

Jurisdiction	Critical Facility Designation	Type	Name	Address	Flood Zone	Fire Threat
Calaveras County Unincorporated Areas	Essential Services Facilities	Government Operations	Planning Office	891 Mountain Ranch Rd	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Government Operations	TSD Office	891 Mountain Ranch Rd	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Government Operations	GIS Office	891 Mountain Ranch Rd	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Government Operations	Calaveras Crisis Center	1404 GOLD HUNTER RD	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Government Operations	Building Office	891 Mountain Ranch Rd	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Government Operations	Code Compliance Office	891 Mountain Ranch Rd	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Government Operations	Admininistration Office	891 Mountain Ranch Rd	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Government Operations	Building & Grounds	891 Mountain Ranch Rd	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Government Operations	San Andreas Yard	891 Mountain Ranch Rd	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Government Operations	Animal Control Office	901 Jeff Tuttle Dr	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Government Operations	Calaveras County Superior Court	400 Government Center Dr	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Government Operations	Mountain Ranch Office	7867 Whiskey Slide Rd	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Government Operations	Arnold Office	2182 HWY 4	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Government Operations	Arnold Yard	1191 Line Baugh Road	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Government Operations	Railroad Flat Office	250 N. Rail Road Flat Road	X	Very High

Jurisdiction	Critical Facility Designation	Type	Name	Address	Flood Zone	Fire Threat
Calaveras County Unincorporated Areas	Essential Services Facilities	Government Operations	Glencoe Yard	16151 Highway 26	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Government Operations	West Point Office	291A Main St	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Medical Health Facility	Silver Oak Medical	702 Mountain Ranch Rd	X	Moderate
Calaveras County Unincorporated Areas	Essential Services Facilities	Medical Health Facility	Allergy Immunology & Asthma	700 Mountain Ranch Rd	X	Moderate
Calaveras County Unincorporated Areas	Essential Services Facilities	Medical Health Facility	Avalon Health Care	900 Mountain Ranch Rd	X	Moderate
Calaveras County Unincorporated Areas	Essential Services Facilities	Medical Health Facility	M.T.S.J. Hospital	768 Mountain Ranch Rd	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Medical Health Facility	MTSJ Behavioral Health	768 Mountain Ranch Rd	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Medical Health Facility	Mact Medical	265 E. St Charles	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Medical Health Facility	Arnold Family Medical Center	2037 Hwy 4	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Other Public Utility	Indian Rock Disposal	1154 Pennsylvania Gulch Rd	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Other Public Utility	Jenny Lind Training Facility	3604 Silver Rapids Road	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Other Public Utility	VSPUD Spray Field	624 Lime Creek Road	X	Moderate
Calaveras County Unincorporated Areas	Essential Services Facilities	Other Public Utility	VSPUD Admin Office	150 Sequoia Ave.	X	Moderate
Calaveras County Unincorporated Areas	Essential Services Facilities	Other Public Utility	Lancha Plana Well ##	12114 Camanche Pkwy, Wallace	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Other Public Utility	VSPUD Warehouse	Oak St. & Myrtle St.	X	Moderate

Jurisdiction	Critical Facility Designation	Type	Name	Address	Flood Zone	Fire Threat
Calaveras County Unincorporated Areas	Essential Services Facilities	Other Public Utility	VSPUD Well #4	Watertown Rd. at Paloma Rd.	X	Moderate
Calaveras County Unincorporated Areas	Essential Services Facilities	Other Public Utility	VSPUD Well #6	778 Paloma Rd.	X	Moderate
Calaveras County Unincorporated Areas	Essential Services Facilities	Other Public Utility	White Pines Barn/Warehouse	OFF BLAGEN RD	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Police	Copperopolis SubStation	3505 Sprangler Ln Suite 105, Lake Tulloch Plaza	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Police	California Highway Patrol	749 Mountain Ranch Rd	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Police	Valley Springs SubStation	200 Hwy 12, Suite C3	X	Moderate
Calaveras County Unincorporated Areas	Essential Services Facilities	Police	Sheriff Station	1045 Jeff Tuttle Drive	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Police	Camanche SouthShore Substation	11700 Wade Ln	X	Moderate
Calaveras County Unincorporated Areas	Essential Services Facilities	Police	Arnold SubStation	2182 Hwy 4, MeadowMont Shopping Center	AE	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Police	Mokelumne Hill Substation	8359 Center St	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Police	West Point SubStation	300 Cemetery Ln #2	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Power Utility	Tulloch Powerhouse		X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Power Utility	New Melones Powerhouse		X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Power Utility	Rock Creek Powerhouse		X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Power Utility	Collierville Powerhouse		X	Non-Wildland/Non-Urban

Jurisdiction	Critical Facility Designation	Type	Name	Address	Flood Zone	Fire Threat
Calaveras County Unincorporated Areas	Essential Services Facilities	Power Utility	Utica Powerhouse		X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Power Utility	Murphys Powerhouse		X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Power Utility	New Hogan Powerhouse		X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Power Utility	Pardee Powerhouse		X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Power Utility	Electra Powerhouse		A	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Power Utility	West Point Powerhouse		A	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Power Utility	Tiger Creek Powerhouse		A	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Power Utility	Salt Springs Powerhouse		X	Non-Wildland/Non-Urban
Calaveras County Unincorporated Areas	Essential Services Facilities	Sewer Facility	Forest Meadows Sewer Treatment	1040 FOREST MEADOWS DR	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Sewer Facility	VSPUD Sewer Plant	214 HWY 12	X	Moderate
Calaveras County Unincorporated Areas	Essential Services Facilities	Solid Waste Facility	Rock Creek Solid Waste	12021 Hunt Road	X	Moderate
Calaveras County Unincorporated Areas	Essential Services Facilities	Transfer Station	Copperopolis Transfer Station	3831 OΓÇÖByrnes Ferry Road	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Transfer Station	Red Hill Transfer Station	5314 Red Hill Road	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Transfer Station	Murphys Transfer Station	580 S. Algiers Street	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Transfer Station	Avery Transfer Station	4541 Segale Road	X	Very High

Jurisdiction	Critical Facility Designation	Type	Name	Address	Flood Zone	Fire Threat
Calaveras County Unincorporated Areas	Essential Services Facilities	Transfer Station	Paloma Transfer Station	4347 Paloma Road	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Transfer Station	San Andreas Transfer Station	4285 Hwy 49	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Transfer Station	Wilseyville Transfer Station	4598 Blizzard Mine Road	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Transportation	Maury Rasmussen Field	3600 Carol Kennedy Rd	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Transportation	Calaveras Transit	750 INDUSTRIAL WY	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Veterans Post	American Legion Post 290	99 School St	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Veterans Post	American Legion Post 102	189 Pine St	X	Moderate
Calaveras County Unincorporated Areas	Essential Services Facilities	Veterans Post	Vfw Post 2600	156 W St Charles St	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Veterans Post	American Legion Post 376	2769 Upper Dorray Rd	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Veterans Post	American Legion Post 787	22273 HWY 26	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Veterans Post	Vfw Post 3322	202 SPINK RD	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Waste Water Facility	Lift Station 2	1022 & 1029 Poker Flat Road	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Waste Water Facility	Lift Station 1	7260 OΓÇÖBrynes Ferry Road	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Waste Water Facility	Lift Station 4	835 Sandy Bar Road	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Waste Water Facility	Lift Station 3	813 Mother Shipton	A	High

Jurisdiction	Critical Facility Designation	Type	Name	Address	Flood Zone	Fire Threat
Calaveras County Unincorporated Areas	Essential Services Facilities	Waste Water Facility	Lift Station 5	684 Foothill Drive	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Waste Water Facility	Lift Station 6	477 Bret Harte	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Waste Water Facility	Lift Station 7	Sunrise & Bret Harte	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Waste Water Facility	Lift Station 8	608 Bret Harte Drive	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Waste Water Facility	Lift Station 13	451 & 453 Lakeview Road	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Waste Water Facility	Lift Station 12	337 & 345 Thompson Lane	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Waste Water Facility	Lift Station 9	189 & 194 Millie Court	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Waste Water Facility	Poker Flat Lift Station #12	485 LOWER THOMPSON LANE	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Waste Water Facility	Lift Station 11	165 Eagle Point	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Waste Water Facility	Lift Station 10	98 & 108 Poker Flat Road	A	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Waste Water Facility	Lift Station 15	5105 Lakeshore Drive	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Waste Water Facility	Copper Cove Reclaimed Water Plant	5130 KIVA PLACE	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Waste Water Facility	Connor Main L.S. #40	SHORELINE DRIVE	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Waste Water Facility	Lift Station 45	1137 Shoreline Court	X	Moderate
Calaveras County Unincorporated Areas	Essential Services Facilities	Waste Water Facility	Lift Station 18	4698 Kiva Drive	X	Very High

Jurisdiction	Critical Facility Designation	Type	Name	Address	Flood Zone	Fire Threat
Calaveras County Unincorporated Areas	Essential Services Facilities	Waste Water Facility	Lift Station 44	6248 Ricky Road	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Waste Water Facility	Saddle Creek LS #1	2696 Oak Creek Drive	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Waste Water Facility	Lift Station 16	4511 Lakeshore Ct	A	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Waste Water Facility	Lift Station 43	6166 Bluff View Road / Conners	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Waste Water Facility	Lift Station 20	4757 Little John Road	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Waste Water Facility	Lift Station 17	4191 LaCrosse Court	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Waste Water Facility	Lift Station 19	4458 Moccasin Court	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Waste Water Facility	Lift Station 22	3201 Arrowhead, Upper X Country	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Waste Water Facility	Vallecito Main Lift Station	3650 MAIN ST	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Waste Water Facility	Vallecito Wastewater Treatment	1901 HOLIDAY MINE RD	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Waste Water Facility	Southworth Wastewater Plant	7466 LESLIE CT	X	Moderate
Calaveras County Unincorporated Areas	Essential Services Facilities	Waste Water Facility	Lakeside LS	633 Forest Meadows Dr	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Waste Water Facility	Azalea LS	530A Azalea Court	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Waste Water Facility	Larkspur LS	535 Larkspur Drive	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Waste Water Facility	HWY 4 LS	3594 Highway 4	X	Very High

Jurisdiction	Critical Facility Designation	Type	Name	Address	Flood Zone	Fire Threat
Calaveras County Unincorporated Areas	Essential Services Facilities	Waste Water Facility	La Contenta Wastewater Treatment	1525 CAMPBELL CT	X	Moderate
Calaveras County Unincorporated Areas	Essential Services Facilities	Waste Water Facility	VSPUD Lift Station #2	Hwy 12 & Lime Creek Rd. by Cosgrove Creek Bridge	A	Moderate
Calaveras County Unincorporated Areas	Essential Services Facilities	Waste Water Facility	VSPUD Lift Station #1	271 E. Hwy 12	A	Moderate
Calaveras County Unincorporated Areas	Essential Services Facilities	Waste Water Facility	Avery Middle School LS	Avery Middle School LS	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Waste Water Facility	Cedar Ridge LS	300 Red Tail Hawk Rd.	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Waste Water Facility	Arnold Wastewater Treatment	3294 HWY 4	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Waste Water Facility	Lift Station 2	2617 Pine Drive	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Waste Water Facility	Mountain Retreat LS	252 MOUNTAIN RETREAT DR	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Waste Water Facility	West Point Wastewater Treatment	20 SANDY GULCH ROAD	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Waste Water Facility	Wilseyville WWTP	4027 N Railroad Flat Rd	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Waste Water Facility	West Point LS	65 Smith Lane	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Water Facility	Copper Cove Water/Sewer	5130 KIVA PLACE	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Water Facility	COPPER COVE 3rd STAGE PUMP	3748 SIGNAL HILL TRAIL	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Water Facility	Tank C	2479 Charmstone Way	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Water Facility	Copperopolis Pump Station	REEDS TURNPIKE	X	Moderate

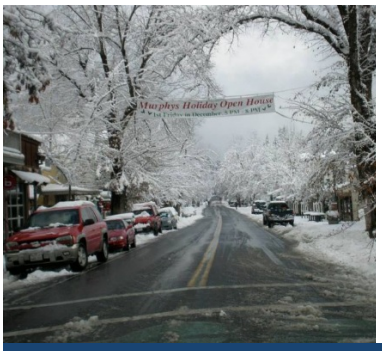
Jurisdiction	Critical Facility Designation	Type	Name	Address	Flood Zone	Fire Threat
Calaveras County Unincorporated Areas	Essential Services Facilities	Water Facility	Copperopolis PS	497 Main Street	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Water Facility	Copperopolis Tank	401 Main St., Copper	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Water Facility	Angels Water Treatment Plant		X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Water Facility	Tank B #	6444 Schmidt Place	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Water Facility	UPUD Water Treatment		X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Water Facility	Jenny Lind Water Treatment	3516 SILVER RAPIDS RD	A	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Water Facility	Tank E/Hogan Lake	2984 Vista Del Lago	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Water Facility	Jenny Lind "A" Tank	Heinemann Road And Hartvickson Lane	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Water Facility	Dennis Court Pump Station	2835 Dennis Court	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Water Facility	Heather Tank	1352 Heather Dr	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Water Facility	Tank F	1600 Hogan Dam Rd.	X	Moderate
Calaveras County Unincorporated Areas	Essential Services Facilities	Water Facility	Tank 602	3446 Ross Drive	X	High
Calaveras County Unincorporated Areas	Essential Services Facilities	Water Facility	VSPUD Water Tank A&B	Oak St. & Myrtle St.	X	Moderate
Calaveras County Unincorporated Areas	Essential Services Facilities	Water Facility	Hunters Water Treatment Plant	335 HUNTER DAM RD	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Water Facility	VSPUD Water Tank C	689 Paloma Rd	X	High

Jurisdiction	Critical Facility Designation	Type	Name	Address	Flood Zone	Fire Threat
Calaveras County Unincorporated Areas	Essential Services Facilities	Water Facility	Sheep Ranch Water Treatment	11719 Armstrong Road	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Water Facility	Avery Tank	4030 Moran Road, Avery	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Water Facility	Avery Pump Station	4030 MORAN RD	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Water Facility	Lakemont PS	3060 Valley View Drive	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Water Facility	Meadowmont Pump Station	2585 Camanche Rd	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Water Facility	Moran Valve Station	1569 Moran Rd	A	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Water Facility	Pinebrook Tank	1607 Wawona Way	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Water Facility	Sawmill Pump Station	SAWMILL ROAD	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Water Facility	60K Tank	2524 Dardanelle Vista	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Water Facility	Big Trees 1 Tank	2947 Navajo Drive	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Water Facility	Big Trees 4&5 Tank	3380 Bigfoot Circle	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Water Facility	Moke River PS	5254 Charles Street	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Water Facility	Bummerville Tank	1670 Valentine Hill Rd	X	Very High
Calaveras County Unincorporated Areas	Essential Services Facilities	Water Facility	West Point Water Treatment	681 Smitty Lane	X	Very High
City Of Angels	At Risk Population Facilities	Congregate Care Facility	Foothill Village Senior Living	1400 Foothill Village Dr	X	High

Jurisdiction	Critical Facility Designation	Type	Name	Address	Flood Zone	Fire Threat
City Of Angels	Essential Services and At Risk Facilities	School / Emergency Shelter	Angels Creek Community Day School	1219 Rasberry Ln	X	Very High
City Of Angels	Essential Services and At Risk Facilities	School / Emergency Shelter	Mark Twain School District	981 Tuolumne Av	X	Very High
City Of Angels	Essential Services and At Risk Facilities	School / Emergency Shelter	Mark Twain Union Elementary K-8	646 Stanislaus Ave	X	High
City Of Angels	Essential Services and At Risk Facilities	School / Emergency Shelter	St. Patrick's Catholic Pre-School	809 S. Main St	X	Very High
City Of Angels	Essential Services and At Risk Facilities	School / Emergency Shelter	Mark Twain Elementary	646 Stanislaus Av	X	High
City Of Angels	Essential Services and At Risk Facilities	School / Emergency Shelter	Lilschuz Foot Steps	476 South Main Street	X	Very High
City Of Angels	Essential Services and At Risk Facilities	School / Emergency Shelter	Bret Harte Union High 9-12	364 Murphys Grade Road	X	High
City Of Angels	Essential Services and At Risk Facilities	School / Emergency Shelter	Bret Harte Union High District	323 South Main St	X	Moderate
City Of Angels	Essential Services and At Risk Facilities	School / Emergency Shelter	Bret Harte High	364 Murphys Grade Rd	X	High
City Of Angels	Essential Services and At Risk Facilities	School / Emergency Shelter	CC Office of Education	185 S. Main St	X	High
City Of Angels	Essential Services and At Risk Facilities	School / Emergency Shelter	Special Education Unit	185 S. Main St	X	High

Jurisdiction	Critical Facility Designation	Type	Name	Address	Flood Zone	Fire Threat
City Of Angels	Essential Services Facilities	Community Food Bank/Pantry	First Baptist of Angels Camp	1555 Depot Road	X	High
City Of Angels	Essential Services Facilities	Community Food Bank/Pantry	Sierra Hope Food Pantry	1168 Booster Way	X	Very High
City Of Angels	Essential Services Facilities	Community Food Bank/Pantry	St. Patrick's Helping Hands	820 S. Main/Highway 49	X	Very High
City Of Angels	Essential Services Facilities	Community Food Bank/Pantry	Seventh Day Adventist Church	140 N. Main/Highway 49	X	High
City Of Angels	Essential Services Facilities	Emergency Medical	American Legion Ambulance	1168 Bush St.	X	Very High
City Of Angels	Essential Services Facilities	Fire Station	Angels City Fire Station 1	1404 Vallecito Dr	X	Very High
City Of Angels	Essential Services Facilities	Fire Station	Angels City Fire Station 2	200 Monte Verda St	X	High
City Of Angels	Essential Services Facilities	Fire Station	Altaville Melones Fire	143 Monte Verda St	X	High
City Of Angels	Essential Services Facilities	Fire Station	Altaville-Cal Fire	125 N. Main St	X	High
City Of Angels	Essential Services Facilities	Government Operations	Angels Camp Office	1168 Booster Wy	X	Very High
City Of Angels	Essential Services Facilities	Medical Health Facility	Angels Camp Family Medical	445 South Main Street	X	Very High
City Of Angels	Essential Services Facilities	Medical Health Facility	Mark Twain Family Medical	222 S Main St	X	Moderate
City Of Angels	Essential Services Facilities	Police	Angels Camp Police Department	200 Monte Verda St	X	High
City Of Angels	Essential Services Facilities	Power Utility	Angels Powerhouse		X	Very High

Source: Cal Fire, FEMA DFIRM 2010, Calaveras County GIS


Murphys Holiday Open House