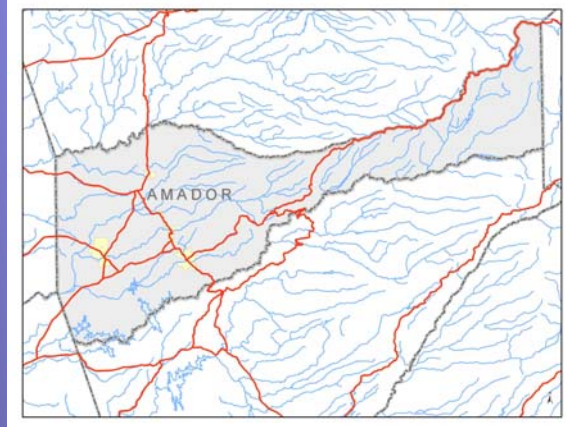
August, 2006

Amador County, California Multi-Hazard Mitigation Plan



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Amador County

Multi-Hazard Mitigation Plan

AUGUST 2006

Developed by AMEC Earth and Environmental, Denver, CO
Hazard Mitigation & Emergency Management Programs

EXECUTIVE SUMMARY

The purpose of hazard mitigation and this plan is to reduce or eliminate long-term risk to people and property from natural hazards and their effects in Amador County, California. This plan has been prepared to meet the Disaster Mitigation Act of 2000 (DMA 2000) requirements in order to maintain Amador's eligibility for the Federal Emergency Management Agency (FEMA) Pre-Disaster Mitigation (PDM) and Hazard Mitigation Grant Programs (HMGP). More importantly, this plan and planning process lays out the strategy that will enable Amador County to become less vulnerable to future disaster losses.

The process followed a methodology prescribed by FEMA. It began with the formation of a Hazard Mitigation Planning Committee (HMPC) comprised of key County, City, District and Stakeholder representatives. The planning process examined the recorded history of losses resulting from natural hazards, and analyzed the future risks posed to the county by these hazards. Amador County is vulnerable to several natural hazards that are identified, profiled, and analyzed in the plan. Wildfires, floods and drought are some of the hazards that can have a significant impact on the County.

The plan puts forth several mitigation goals and objectives that are based on the results of the risk assessment. To meet identified goals and objectives, the plan also includes specific recommendations for actions that can mitigate future disaster losses. The multi-jurisdictional plan includes the County, and the incorporated communities of Amador City, Ione, Jackson, Plymouth, and Sutter Creek. This plan also covers two participating districts: Amador Water Agency and the Jackson Valley Irrigation District. This plan has been formally adopted by each participating entity and is required to be updated a minimum of every five years.

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Multi-Hazard Mitigation Plan
1.0 Introduction

Amador County has prepared this Multi-Hazard Mitigation Plan pursuant to the requirements of the Disaster Mitigation Act of 2000, PL 106-390 and established regulations at 44 CFR Part 201.6 (hereafter referred to as DMA; see Appendix A for a list of acronyms used in this document). This Plan documents the Amador County DMA planning process, identifies natural hazards and associated risks of concern, and identifies Amador County's hazard mitigation strategy to make the County less vulnerable and more disaster resistant and sustainable. Information in the Plan can also be used to help guide and coordinate mitigation activities, local mitigation policies, and future land use decisions.

Hazard Mitigation is defined as any sustained action taken to reduce or eliminate long-term risk to human life and property from hazards. Hazard Mitigation Planning is the process through which natural hazards that threaten communities are identified, likely impacts of those hazards are determined, mitigation goals are set, and appropriate strategies that would lessen the impacts are determined, prioritized, and implemented. Hazard Mitigation Planning is required for state and local governments to maintain their eligibility for certain federal disaster assistance and hazard mitigation funding programs.

This section of the Plan describes the purpose and need for the Plan, the scope of this effort and Plan organization.

PURPOSE AND NEED

Each year, natural disasters in the United States kill 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 non-government organizations are not reimbursed by tax dollars. Additionally, many natural disasters are predictable, often with the same results. Many of the damages caused by these events can be alleviated or even eliminated.

FEMA, the Federal Emergency Management Agency, now a part of the Department of Homeland Security, has targeted reducing losses from natural disasters as one of its primary goals. Hazard Mitigation planning and subsequent implementation of projects, measures, and policies developed through those plans are the primary mechanisms for achieving these goals. Success in reducing disaster damages has taken place as the result of mitigation projects implemented subsequent to mitigation planning.

DMA 2000 requires state and local governments to develop Hazard Mitigation Plans in order to maintain their eligibility for certain Federal disaster assistance and hazard mitigation funding programs. Compliance with these requirements will maintain the County's continued eligibility for certain FEMA hazard mitigation grant programs. Communities at risk from natural disasters can not afford to jeopardize this funding.

More importantly, proactive mitigation planning at the local level can help reduce the cost of disaster response and recovery to property owners and governments by protecting critical community facilities, reducing liability exposure, and minimizing overall community impacts and disruption. Amador County has been affected by natural hazards in the past and is committed to reducing disaster impacts and maintaining eligibility for Federal mitigation grant funding.

SCOPE

The Amador County Multi-Hazard Mitigation Plan is a multi-jurisdictional plan that covers the following incorporated communities that participated in the planning process:

- Amador County
- City of Amador City
- City of Ione
- City of Jackson
- City of Plymouth
- City of Sutter Creek

This plan also covers two additional districts and organizations within Amador County that meet the FEMA definition of "local government" and participated in the planning process. The participating districts and agencies include:

- Amador Water Agency
- Jackson Valley Irrigation District

This Plan follows DMA planning requirements and associated guidance for developing Local Hazard Mitigation Plans. These guidance set forth a generalized 4-task planning process: 1) Organize your Resources, 2) Assess Hazards and Risks, 3) Develop a Mitigation Plan, and 4) Evaluate your Work.

This plan addresses natural hazards only. Although the participants of the Amador County Hazard Mitigation Planning Committee (HMPC) recognize that FEMA is both encouraging and promoting communities to integrate human-caused hazards into the mitigation planning process, the scope of this effort did not address these human-caused hazards for two reasons. First, many of the planning activities for the mitigation of human-caused hazards are either underway or complete, and have been developed by a different set of organizations. Secondly, DMA requires extensive public information and input, and this is in direct conflict with the confidentiality necessary in planning for the fight against chemical, biological, and radiological terrorism. The

HMPC determined it was not in the community's best interest to publicly share specific information about the area's vulnerability to human-caused hazards.

PLAN ORGANIZATION

Amador County's Multi-Hazard Mitigation Plan is organized as follows:

Executive Summary
1.0 Introduction
2.0 County Profile
3.0 Planning Process
4.0 Risk Assessment
5.0 Mitigation Strategy
6.0 Plan Adoption
7.0 Plan Implementation & Maintenance

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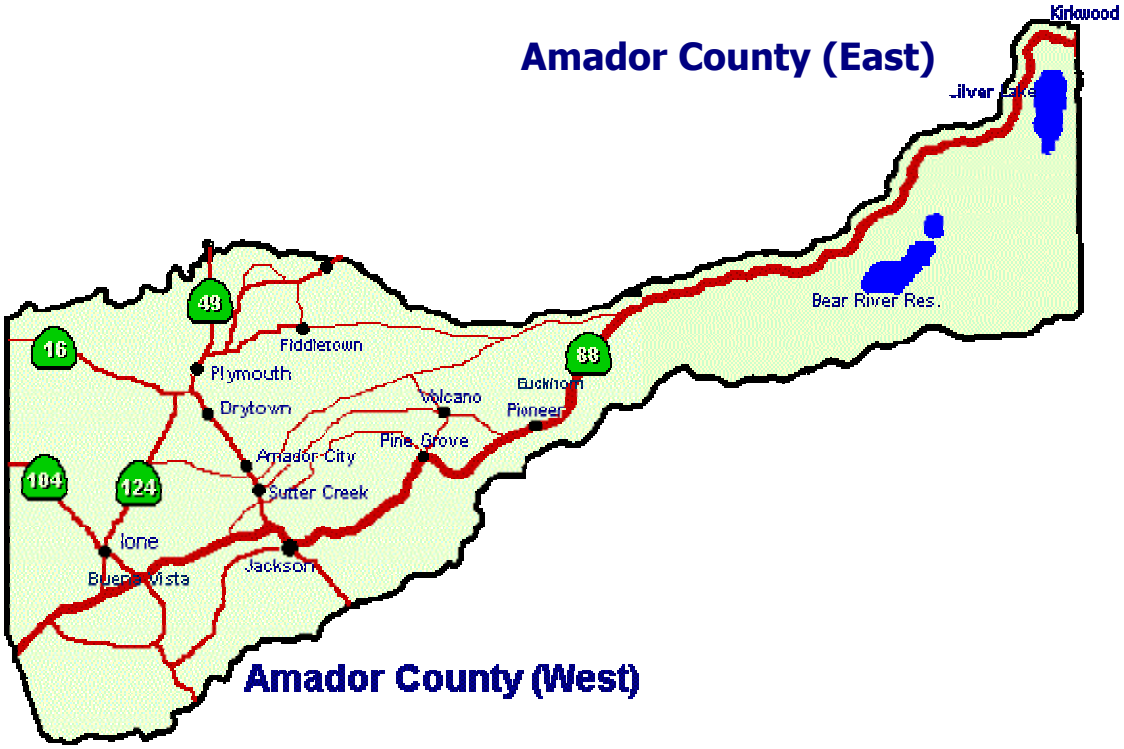
Multi-Hazard Mitigation Plan
2.0 County Profile

Amador County is located on the western slope of the Sierra Nevada Mountains in north-central California, southeast of the Sacramento metropolitan area. The County is bordered by Alpine County to the east, El Dorado County to the north, Sacramento County to the northwest, San Joaquin County to the southwest, and Calaveras County to the south. The City of Jackson, the County seat, is located approximately 380 miles north of the City of Los Angeles, 130 miles east of the City of San Francisco, and 45 miles southeast of the City of Sacramento. The Consumnes River along the northern border and the Mokelumne and North Mokelumne Rivers along the southern border serve as natural boundaries for Amador County. Amador County is represented in the following maps.

Amador County
Vicinity Map



Amador County was established in 1854 from parts of Calaveras and Eldorado Counties and was an important part of the California Mother Lode gold-mining region. In the 1850's, just after gold was discovered at Coloma in nearby El Dorado County, Andrew Kennedy discovered the claim that was to become world famous as the Kennedy Mine in the area that is now the city of Jackson. It would turn out to be one of the richest in the Mother Lode. With its extremely deep mine shafts (the deepest 5,912 feet), it was to be productive for 50 years.

The topography of the County ranges from low-foothill to high Sierra Nevada Mountain areas, with elevations ranging from 150 feet above mean sea level (msl) in the western portion of the county to more than 9000 feet above msl in the eastern portions of the county. The climate varies widely between the lower west foothill area to the alpine eastern portion of the County. In the western lowlands, summers are hot and winters are mild. Temperatures range from an average of 45 degrees Fahrenheit in January to 79 degrees Fahrenheit in July. Summers and winters are cooler in the higher elevations of the Sierra Nevada Mountains in the east and there is heavy snowfall in this area. Precipitation averages 20 and 60 inches in the western and eastern parts of the County, respectively.

The Shenandoah Valley area, north of the City of Jackson, is noted for its vineyards and small, high-quality wineries. Tourism and recreation are key economic factors, with historic sites along State Highway 49; high-elevation winter sports areas such as Kirkwood; and outdoor recreation, including fishing and camping, ranging from high mountain lakes to foothill reservoirs at Pardee and Camanche. The largest business/agency employers in the County include: the Mule Creek

State Prison in Ione, the Jackson Rancheria Casino and Hotel and the Amador County Unified School District.

The primary transportation routes through the County are the north-south Old State Highway 49 and the east-west State Highway 88. The Amador County Airport is located at Martell, immediately north of the City of Jackson. A Southern Pacific rail line connects the City of Ione on the western side of the County with Stockton. This line is used for light industrial purposes only.

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Multi-Hazard Mitigation Plan

3.0 Planning Process

44 CFR Requirement 201.6(c)(1): [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.

The Amador County, Office of Emergency Services (OES) recognized the need and importance of this Plan and was responsible for its initiation. The primary funding source for this planning assistance contract was obtained by the County OES in the form of a FEMA grant.

Amador County contracted with AMEC Earth & Environmental (AMEC) to facilitate and develop this Multi-Hazard Mitigation Plan. AMEC's role was to:

- Assist in establishing a HMPC; as defined by DMA regulations;
- Meet the DMA requirements as established by federal regulations, following FEMA's planning guidance;
- 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 the State OES and FEMA Region IX reviews of this plan.

In addition, planning team members contributed in-kind services to this effort by attending meetings, collecting data, managing administrative details, and providing facilities for meetings.

AMEC established the planning process utilizing the DMA planning requirements and FEMA's associated guidance. This guidance is structured around a generalized four-phase process:

1) Organize resources,
2) Assess hazards and risks,
3) Develop a mitigation plan, and
4) Evaluate the work.

This Plan also utilizes the process set forth in FEMA Region IX's Crosswalk Reference Document for Review and Submission of Local Mitigation Plans, and the California Office of Emergency Services (CA-OES) guidance for Local Hazard Mitigation Plans (LHMP).

AMEC also integrated an older, more detailed 10-step planning process that was required, at the time this effort was initiated, for other FEMA mitigation plans such as for FEMA's Community Rating System (CRS) and Flood Mitigation Assistance (FMA) programs. Thus, AMEC formulated a single planning process to meld these two sets of planning requirements together

and that meets the requirements of five major programs: CRS, FMA, FEMA's Hazard Mitigation Grant Program (HMGP) and Pre-Disaster Mitigation program (PDM) and new flood control projects authorized by the U.S. Army Corps of Engineers (USACE).

The following table shows how the 10-step process fits within the four-phase process.

DMA/AMEC Plan Process	
DMA 4-Task Process (44 *CFR* 201.6)	**AMEC 10-Step Process**
Planning process	**Organize Resources**
201.6(c)(1)	1. Organize
201.6(b)(1)	2. Involve the public
201.6(b)(2) & (3)	3. Coordinate
Risk assessment	**Identify Hazards/Assess the Risks**
201.6(c)(2)(i)	4. Assess the hazard
201.6(c)(2)(ii) & (iii)	5. Assess the problem
Mitigation strategy	**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
Plan maintenance	**Adopt and Implement the Plan**
201.6(c)(5)	9. Adopt the plan
201.6(c)(4)	10. Implement, evaluate, revise

LOCAL GOVERNMENT PARTICIPATION

The DMA planning regulations and guidance stress that each local government seeking the required FEMA approval of their mitigation plan must participate in the planning effort which is defined as meeting all of the following requirements:

- Participate in the process,
- Detail areas within the planning area where the risk differs from that facing the entire area,
- Identify specific projects to be eligible for funding, and
- Have the governing board formally adopt the plan.

For Amador County HMPC members, 'participation' meant that the local government representatives:

- Attended and participated in the HMPC meetings,
- Provided available data requested of the HMPC,

- Reviewed and provided comments on the plan drafts,
- Advertised, coordinated and participated in the public input process, and
- Coordinated the formal adoption of the plan by the governing boards.

THE 10-STEP PLANNING PROCESS

As described below, the planning process followed a 10-Step planning process:

Step 1: Get Organized – Building the Planning Team

With the County's commitment to participate in the DMA planning process, AMEC worked with the County OES to establish the framework and organization for development of the Plan. The Plan was developed by the HMPC led by the County OES and facilitated by AMEC, and was comprised of key County, City and other local government and stakeholder representatives. The list of participating HMPC members is provided below.

County

- County OES
- Planning Department
- Agricultural Department
- Environmental Health Department
- Building Department
- Public Works Department
- Assessor's Office
- Geographic Information Systems (GIS)
- County Archives

Cities

- City of Amador City
- City of Ione
- City of Jackson
- City of Plymouth
- City of Sutter Creek

Local Government/Agency Representatives

- Amador Water Agency
- Jackson Valley Irrigation District
- Amador Fire Safe Council

The planning process officially began on April 8, 2005 with a kick-off meeting in the County. The meeting covered the scope of work and an introduction to the DMA 2000 requirements. Participants were provided with a Data Collection Guide (Appendix B) that included worksheets to facilitate the collection of information necessary to support development of the plan. Utilizing FEMA guidance, worksheets were designed by AMEC to capture information on historic hazard

events, identify hazards of concern to the County, quantify values at risk to identified hazards, and inventory existing capabilities. Participants were also provided a mitigation project worksheet to record ideas for possible projects identified during the planning process.

The HMPC communicated during the planning process with a combination of face to face meetings, by email and through the use of an FTP (file transfer protocol) site where draft documents were uploaded for download and review by team members. The HMPC met three times over a one-year period.

HMPC Meeting	Meeting Topic	Meeting Date
1	Kick Off Meeting: Introduction to DMA 2000 and the Planning Process and Hazard Identification	April 8, 2005
2	Risk Assessment Overview and Work Session/ Development of Mitigation Goals and Objectives	January 24, 2006
3	Developing and Prioritizing Mitigation Recommendations	January 25, 2006
5	Public meeting	August 15, 2006

Attendees and agendas for each of the HMPC meetings are on file with the Amador County OES.

Step 2: Plan for Public Involvement – Engaging the Public

At the kick-off meeting, the HMPC discussed options for public involvement. The HMPC's approach utilized established public information mechanisms and resources within the Community. Public involvement activities included press releases, website postings and collection of public comments to the Draft Plan. A public meeting was held during the draft plan development process. Stakeholder and public comments are reflected in the preparation of the plan, including those sections addressing mitigation goals and action strategies. All press releases and website postings are on file with the Amador County OES. The plan is online and available for viewing at:
http://www.co.amador.ca.us/depts/oes/OES_Plan.cfm.

Step 3: Coordinate with other Departments and Agencies

Early on in the planning process, the HMPC determined that data collection, mitigation and action strategy development, and plan approval, would be greatly enhanced by inviting other state and federal agencies to participate in the planning 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 key agencies were invited to participate as members of the HMPC:

- Amador Fire Safe Council
- California Department of Forestry and Fire Protection

- California Office of Emergency Services
- Central Sierra Resource Conservation & Development
- Weber, Ghio & Associates, Inc., Flood consultant for incorporated cities
- Jackson Rancheria Casino
- U.S. Forest Service

In addition to those listed above, the HMPC utilized the resources of the agencies and groups listed below in the development of this Plan. Specifically, technical data, reports and studies were obtained from those agencies and groups listed below as well as those identified above either through web-based resources or directly from agency resources.

- Amador County Resource Conservation District
- Bureau of Land Management
- California Department of Health Services
- California Department of Water Resources
- California Department of Transportation
- California Geological Survey
- Central Sierra Resource Conservation and Development
- FEMA Region IX
- National Oceanic and Atmospheric Administration, National Climatic Data Center
- National Oceanic and Atmospheric Administration, National Weather Service
- National Oceanic and Atmospheric Administration, CIRES Climate Diagnostics Center
- Seismic Safety Commission
- State and Federal Historic Preservation Districts
- Department of Interior, U.S. Fish & Wildlife
- Department of Interior, U.S. Geological Survey
- Western Regional Climate Center

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 from natural hazards. The County utilizes a variety of comprehensive planning mechanisms such as the General Plan and County policies to guide and control County growth and development. Integrating existing planning efforts and mitigation policies and action strategies into this Multi-Hazard Mitigation Plan establishes a credible plan that ties into and supports other County and incorporated community programs. The development of this plan utilized information included in the following key plans, studies, reports, and initiatives from the County and other participating jurisdictions:

- General Plans
- Emergency Management Plans
- State of California, Multi-Hazard Mitigation Plan, 2004
- Amador Fire Plan

- Amador County Hazardous Fuels Reduction Plan
- Consumnes, Molkelumne, and Dry Creek Watershed studies
- Flood Insurance Studies

A more complete listing of these resources is provided in Appendix E. In addition, many other documents were reviewed and considered, as appropriate, in Steps 4 and 5 during the collection of data to support the Risk Assessment portion of the plan.

Step 4: Hazard Identification and Step 5: Risk Assessment

AMEC led the HMPC in an exhaustive research effort to identify and document all the natural hazards that have, or could, impact the County. Data collection worksheets were developed and utilized in this effort to aid in determining hazards and vulnerabilities, and where the risk varies across the planning area. GIS was also used to display, analyze, and quantify hazards and vulnerabilities. Step 5 included a Capability Assessment which documents the participating jurisdictions' current capabilities to mitigate natural hazards. A more detailed description of the risk assessment process and the results are included in this plan as Section 4.0 – Risk Assessment.

Step 6: Identifying Goals and Step 7: Review Possible Measures

AMEC facilitated brainstorming and discussion sessions with the HMPC that described the purpose and the process of developing planning goals and objectives, examined a comprehensive range of mitigation alternatives, and utilized a method of selecting and defending recommended mitigation actions determined by a series of selection criteria. This information is included in this plan as Section 5.0 – Mitigation Goals and Strategy. Additional planning process documentation of the mitigation strategy development is provided in Appendix C.

Step 8: Draft the Mitigation Action Plan

AMEC developed several drafts of this plan for the HMPC. The first two drafts consisted of the Hazard Identification only and the Hazard Identification and Risk Assessment portion of the plan and was reviewed by members of the HMPC in advance of the mitigation planning goals and strategy development meetings. AMEC received comments, made appropriate revisions at the direction of the HMPC, and developed a first complete draft of this plan, which included the HMPC's mitigation strategy and other required plan elements. This complete draft was posted for HMPC review and comment on an internal ftp site. Other agencies were invited to comment on this draft as well. Team and agency comments were integrated into the second complete draft, which was advertised and distributed for the purpose of collecting public input and comments. The comments and issues from the public and the additional internal review comments were then discussed with the HMPC, appropriate revisions were made, and a third and final draft of the plan was produced reflecting the public and technical input for CA-OES and FEMA review.

Step 9: Adopt the Plan

In order to secure buy-in and officially implement the plan, the plan was adopted by the Amador County Board of Supervisors and governing boards for the other participating jurisdictions. Scanned versions of the adoption resolutions are included as part of Appendix D to this plan.

Step 10: Implement the Plan

The true worth of this, and any mitigation plan, is its final step – implementation. To this point, all of the HMPC 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 of the specific action. Beyond that, however, an overall implementation strategy is described in Section 7.0 – Implementation and Plan Maintenance.

Finally, there are numerous organizations within the County whose goals and interests interface with hazard mitigation. Coordination with these other planning efforts is paramount to the ongoing success of this plan and mitigation in the County and is addressed further in Section 7.0. A plan update and maintenance schedule and a strategy for continued public involvement is also documented in Section 7.0.

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Multi-Hazard Mitigation Plan
4.0 Risk Assessment

44 CFR 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".

Risk from natural hazards is a combination of hazard and exposure. The risk assessment process identifies relevant hazards and the exposure of lives, property, and infrastructure to the hazards. The goal of the risk assessment is to measure the potential loss to a community, including loss of life, personal injury, property damage, and economic injury from a hazard event.

The risk assessment process allows a community to better understand their potential risk and associated vulnerability to natural hazards. This information provides the framework for a community to develop and prioritize mitigation strategies and plans to help reduce both the risk and vulnerability from future hazard events. This risk assessment for Amador County followed the methodology described in the FEMA publication 386-2 Understanding Your Risks – Identifying Hazards and Estimating Losses (FEMA, 2002) and was based on a four-step process:

(1) Identify Hazards,
(2) Profile Hazard Events,
(3) Inventory Assets, and
(4) Estimate Losses.

This risk assessment covers Planning Step 4: Assess the Hazard and Planning Step 5: Assess the Problem. It also includes a third component, Existing Mitigation Capabilities, in which the risk and vulnerability are analyzed in light of existing mitigation measures such as building codes, warning systems and floodplain development regulations.

The risk assessment for this plan, between the County and the incorporated communities, covers the entire geographical extent of the Planning Area. Thus, the risk assessment for the Amador County Planning Area includes and directly corresponds to the County and the following incorporated communities and districts:

- City of Amador City
- City of Ione
- City of Jackson
- City of Plymouth
- City of Sutter Creek
- Amador Water Agency
- Jackson Valley Irrigation District

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Multi-Hazard Mitigation Plan
4.1 Hazard Identification

The Amador County HMPC conducted a Hazard Identification study to determine what hazards threaten the planning area. This section of the plan documents the previous occurrences of natural hazards, those that might occur in the future, and the likelihood of their recurrence. This Hazard Identification addressed steps 1 and 2 of FEMA's four-step process for conducting risk assessments:

(1) Identify Hazards,
(2) Profile Hazard Events,
(3) Inventory Assets, and
(4) Estimate Losses.

The HMPC relied on a variety of sources to identify and profile the natural hazards in Amador County. Utilizing existing data and plans available from participating jurisdictions as well as input from planning meetings, the HMPC agreed upon a list of those natural hazards of concern to the participating communities. Historical data from FEMA, the National Oceanic and Atmospheric Administration (NOAA), National Climatic Data Center (NCDC), CA-OES and other sources were also examined to confirm the significance of these hazards to the planning area. Significance of an identified hazard to the community was measured in general terms, focusing on key criteria such as frequency and resulting damage, including deaths/injuries and property, crop, and economic damages to a community. The natural hazards evaluated as part of this plan include those that have either historically caused or have the future potential to cause significant human and/or monetary losses.

The natural hazards identified and investigated for the Amador County multi-jurisdictional plan include:

- Avalanches
- Agricultural Hazards
- Dam Failure
- Drought
- Earthquakes
- Floods
- Landslides/Debris Flows
- Land Subsidence
- Natural Health Hazards
    - West Nile Virus
    - Rabies

- Severe Weather
    - ♦ Extreme Temperatures
    - ♦ Fog
    - ♦ Heavy Rains/Thunderstorms/Wind/Lightning
    - ♦ Snow
    - ♦ Tornadoes
- Wildfires
- Volcanoes

Also discussed by the HMPC, the natural hazards listed below were eliminated from further consideration because: (1) they either occur rarely or not at all, and (2) when they do occur, they are very limited in magnitude—no or very limited damages are sustained.

- Hurricanes
- Dust Storms

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

Highly Likely*: Near 100% chance of occurrence in next year, or happens every year.*

Likely*: Between 10 and 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.*

The frequency, or chance of occurrence, was calculated where possible based on existing data. Frequency was determined by dividing the number of events observed by the number of years and multiplying by 100. This gives the percent chance of the event happening in any given year. An example would be 3 droughts occurring over a 30 year period which equates to 10% chance of that hazard occurring any given year.

In order to understand how natural hazards affect the Amador County Planning Area, the Disaster Declaration History for the County is summarized, followed by a discussion of each natural hazard. Identified natural hazards start with severe weather, which is the driving force behind most all natural hazards affecting Amador County, and then followed by the big three natural hazards in California: flood, wildfire, and earthquake. The remaining natural hazards are then addressed alphabetically.

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 Amador County. 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 of sufficient magnitude and severity that both the local and state government's capacity are exceeded, a federal disaster declaration may be issued, allowing for the provision of federal disaster assistance.

Since the passage of the Stafford Act in 1988, FEMA Region IX has experienced 50 Presidential Disaster Declarations, obligating $10.4 billion to date. Within Amador County, there were 16 state declarations from 1950 through 2004, eight of which also qualified as federal disaster declarations. 14 of the 16 state declarations were associated with severe winter storms, heavy rains and flooding. The other two were declarations for severe wildfires and drought.

Amador County State and Federal Disasters Declaration
1950-2004

Hazard Type	Disaster Name	Disaster #	Year	State Declaration	Federal Declaration	# of Deaths	# of Injuries	Cost of Damage
Flood	Floods	CDO 50-01	1950	11/21/50	Not declared	9		$32,183,000
Flood	Floods	DR-47	1955	12/22/55	12/23/55	74		$200,000,000
Flood	Storm & Flood Damage	CDO 58-03	1958	2/26/58	Not declared			Not available
Flood	Storm & Flood Damage	N/A	1958	4/2/58	82	13		$24,000,000
Severe Storm	Unseasonal and Heavy Rainfall	N/A	1959	9/17/59	Not declared	2		$100,000
Fire	Widespread Fires	N/A	1961	9/8/61	Not declared			$5,696,813
Severe Storm, Flood	Abnormally Heavy and Continuous Rainfall	N/A	1963	2/14/64	Not declared			Not Available
Flood	Flood and Rainstorm	Unknown	1963	2/7/63, 2/26/63, 2/29/63, & 4/22/63	145 (2/25/63)			Not available

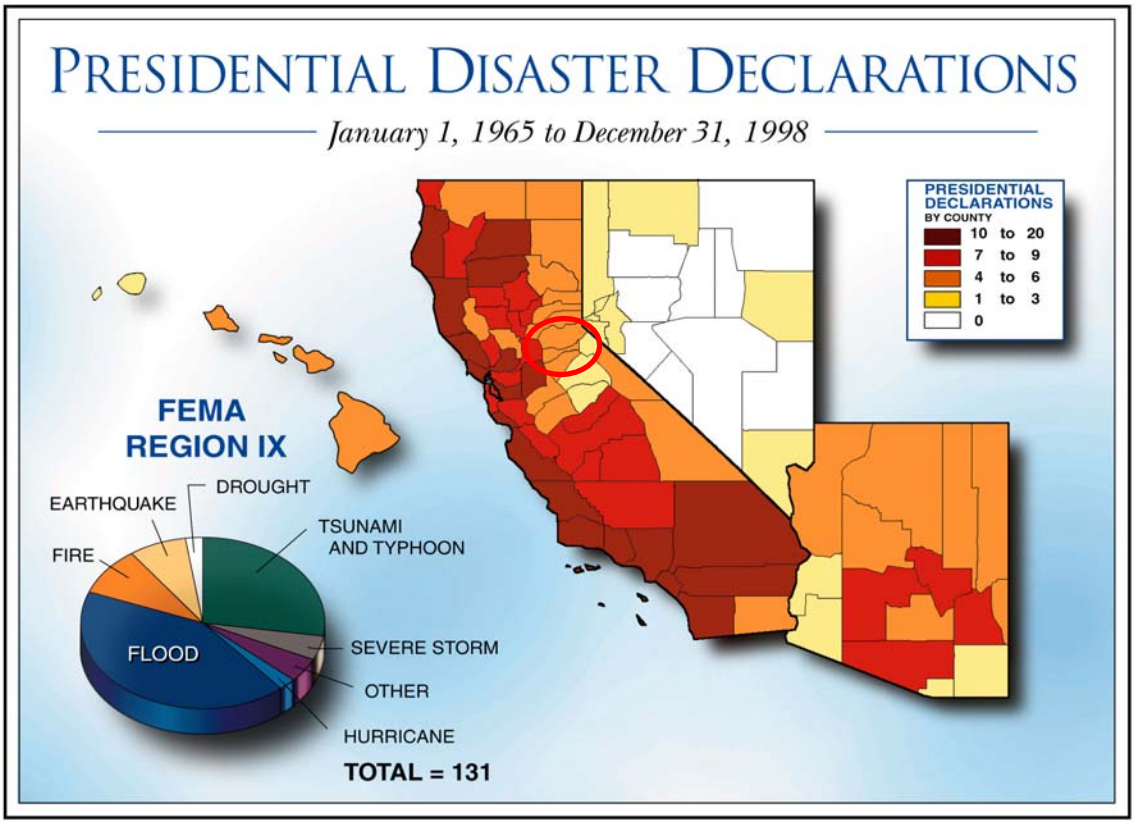
Hazard Type	Disaster Name	Disaster #	Year	State Declaration	Federal Declaration	# of Deaths	# of Injuries	Cost of Damage
Flood	1964 Late Winter Storms	Unknown	1964	12/22/64, 12/23/64, 12/28/64, 1/5/65, & 1/1/65	12/29/64			$213,149,000
Flood	1969 Storms	Unknown	1969	1/23/69, 1/25,69, 1/28/69, 1/29/69, 2/8/69, 2/10/69, 2/16/69, 3/12/69	1/26/69	47	161	$300,000,000
Drought	Drought	N/A	1976	2/9/76, 2/13,76, 2/24/76, 3/26/76, 7/6/76	Not declared			$2,664,000,000
Severe Storm	Storms	DR-758	1986	2/18-86 - 3/12/86	2/18/86	13		$407,538,904
Severe Storm	Severe Winter Storms	DR-1044	1995	1/6/95 - 3/14/95	1/13/95	11		$741,400,000
Severe Storm, Flood	Late Winter Storms	DR-1046	1995		1/10/95	17		$1,100,000,000
Flood	January 1997 Floods		2003	1/2/97 - 1/31/97		8		$1,800,000,000
Flood	El Nino	DR-1203	1998			17		$550,000,000

(Source: CA-OES)

In addition, in January of 2006 the California Governor declared a state of emergency for Amador County and others in the San Joaquin and Central Valleys due to severe winter storms and floods. A Presidential Disaster Declaration is also pending for the spring storms of 2006.

It is important to note that the federal government may also issue a disaster declaration through the U.S. Department of Agriculture (USDA) and/or the Small Business Administration (SBA), as well as through FEMA. The quantity and types of damage are the determining factors.

The following map, from the FEMA Website, displays the number of Presidential Disaster Declarations within Amador County between 1965 and 1998.



SEVERE WEATHER

Severe weather conditions generally occur on an annual basis throughout Amador County. However, it appears that many of these events go unreported. A database maintained by the NCDC only identified 8 severe weather events occurring in Amador County between January 1, 1950 and December 31, 2004. The NCDC data is summarized in the table below. Of the eight reported events, all were associated with heavy rains and flooding. There were no identified injuries or damages to property associated with this data. Details on notable events identified in the table are included in the plan sections that follow.

National Climatic Data Center
Severe Weather Reports
Amador County 1950-2004

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1 AMADOR	01/10/1995	04:00 AM	Flood	N/A	0	0	0	0
2 Countywide	01/12/1998	04:00 AM	Heavy Rain	N/A	0	0	0	0
3 Countywide	01/18/1998	12:00 PM	Heavy Rain	N/A	0	0	0	0
4 Plymouth	05/05/1998	01:20 PM	Funnel Cloud	N/A	0	0	0	0
5 Jackson	02/09/1999	10:35 AM	Flash Flood	N/A	0	0	0	0
6 Sutter Creek	02/09/1999	10:35 AM	Flash Flood	N/A	0	0	0	0
7 Sutter Creek	02/09/1999	10:45 AM	Flash Flood	N/A	0	0	0	0
8 Pine Grove	01/22/2000	06:00 PM	Heavy Rain	N/A	0	0	0	0
				TOTALS:	0	0	0	0

(Source: NCDC)

Another information source for severe weather events is the Sheldus database, a component of the University of South Carolina hazards research lab. The main data sources for this information include, "Storm Data and Unusual Weather Phenomena" by the NCDC and information from the National Geophysical Data Center and the Storm Prediction Center. According to the Sheldus database, from 01/01/1960 through 10/23/2000, there were 81 severe weather events identified for Amador County resulting in 20.31 injuries, 7.20 deaths, property damage of $ 43,089,782.45 and crop damage of $22,032,196.29. Of the 81 identified events, they were predominantly characterized as follows:

- Winter Weather – 23 events
- Thunderstorm/heavy rains – 20 events
- Wind – 18 events
- Flooding – 11 events
- Fog – 3 events
- Lightning – 2 events
- Extreme Heat – 1 event
- Extreme Cold – 1 event
- Landslide – 1 event
- Wildfire – 1 event

The details from the Sheldus database are included in the following table. Although the database search was conducted for Amador County, many of the reported events occurred beyond the county on a regional and sometimes statewide basis. As a result, the reported

injuries, fatalities, property damage and crop damage may not be an accurate estimate for the county.

Sheldus Database
Severe Weather Reports
Amador County 1960-2000

HAZARD BEGIN DATE	HAZARD END DATE	HAZARD TYPE	INJURIES	FATALITIES	PROPERTY DAMAGE	CROP DAMAGE	REMARKS
02/01/1960	02/01/1960	SEVERE STORM/THUNDER STORM, WIND	0.03	0.09	1470.59	0	WIND, RAIN
02/07/1960	02/09/1960	SEVERE STORM/THUNDER STORM, WIND	0.06	0.06	10416.67	10.42	RAIN, WIND
10/16/1960	10/16/1960	WIND	0	0	1136.36	0	WIND
03/16/1961	03/17/1961	WIND	0	0	862.09	0	WIND
04/22/1961	04/24/1961	LIGHTNING, WIND, WINTER WEATHER	0	0	14.71	14705.88	FROST, WIND, LIGHTNING
06/13/1961	06/17/1961	HEAT	0	0	0	14705.88	HEAT
08/11/1961	08/13/1961	SEVERE STORM/THUNDER STORM	0	0	86.21	862.07	THUNDERSTORMS
10/07/1961	10/08/1961	WIND	0	0.03	862.07	0	WIND
01/20/1962	01/21/1962	WINTER WEATHER	0.86	0.12	8620.69	0	WINTER STORM
02/07/1962	02/26/1962	SEVERE STORM/THUNDER STORM, WIND	0.26	0.35	86206.9	0	WIND AND RAIN
07/24/1965	07/25/1965	LIGHTNING	0	0	1041.67	0	LIGHTNING
08/10/1965	08/11/1965	SEVERE STORM/THUNDER STORM	0.03	0	862.07	8620.69	THUNDERSHOWERS
09/16/1965	09/17/1965	WIND	0	0	14705.88	1470.59	NORTH WIND
11/14/1965	11/18/1965	SEVERE STORM/THUNDER STORM	0	0.02	8620.69	0	HEAVY RAIN
11/23/1965	11/24/1965	SEVERE STORM/THUNDER STORM	0	0.18	1315.79	0	HEAVY RAIN
12/28/1965	12/30/1965	SEVERE STORM/THUNDER STORM, WIND	0	0	862.07	0	RAIN AND WIND
01/15/1966	01/17/1966	WIND	0	0.05	11363.64	113.64	HIGH WIND
01/20/1967	01/31/1967	SEVERE STORM/THUNDER STORM, WIND	0.07	0.02	8620.69	86.21	RAIN AND WIND
03/12/1967	03/13/1967	SEVERE STORM/THUNDER STORM, WIND, WINTER WEATHER	0	0	862.07	0	SNOW, WIND, RAIN
12/12/1967	12/15/1967	SEVERE STORM/THUNDER STORM, WIND, WINTER WEATHER	0	0.07	8620.69	8620.69	WIND, RAIN, SNOW, AND COLD
01/29/1968	01/30/1968	SEVERE STORM/THUNDER STORM, WINTER WEATHER	0	0	1470.59	0	RAIN AND SNOW
01/18/1969	01/28/1969	SEVERE STORM/THUNDER STORM	0.17	0.78	862068.97	8620.69	HEAVY RAIN

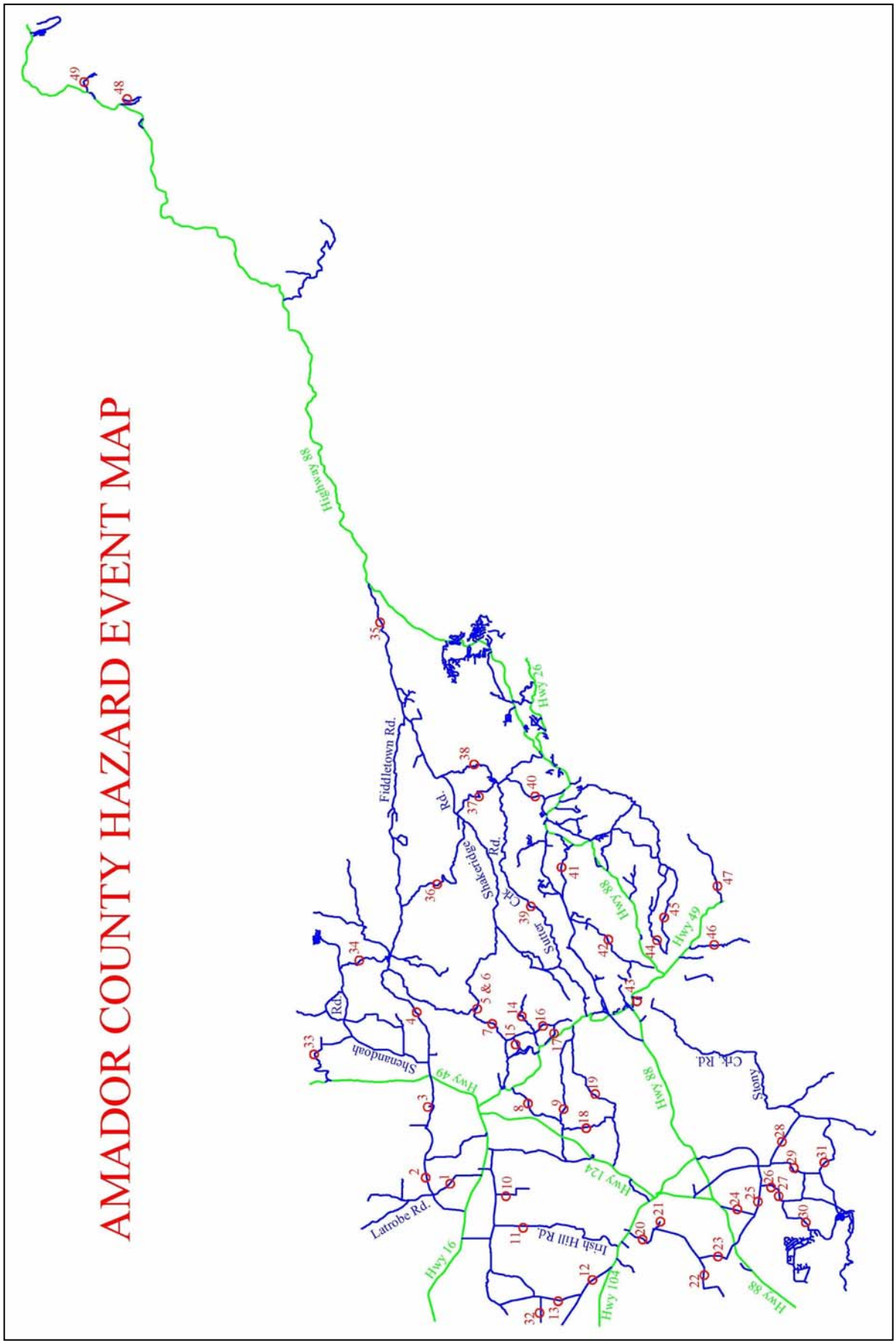
HAZARD BEGIN DATE	HAZARD END DATE	HAZARD TYPE	INJURIES	FATALITIES	PROPERTY DAMAGE	CROP DAMAGE	REMARKS
02/20/1969	02/25/1969	SEVERE STORM/THUNDER STORM, WIND, WINTER WEATHER	0.07	0.57	1666666.67	166666.67	WIND, RAIN, SNOW
01/08/1970	01/26/1970	SEVERE STORM/THUNDER STORM, WIND	0	0.1	10416.67	0	RAIN AND WIND
04/27/1970	04/29/1970	WINTER WEATHER	0	0	0	11627.91	FREEZE
01/16/1973	01/16/1973	FLOODING, SEVERE STORM/THUNDER STORM	0	0.02	86206.9	0	HEAVY RAINS, FLOODS
12/23/1979	12/24/1979	SEVERE STORM/THUNDER STORM, WIND, WINTER WEATHER	0	0	14285.71	0	RAIN, SNOW, WIND
01/09/1980	01/13/1980	SEVERE STORM/THUNDER STORM, WIND	0	0	1041.67	1041.67	HIGH WIND, HEAVY RAIN
01/27/1981	01/29/1981	WINTER WEATHER	0	0	1041.67	0	WINTER STORM
12/22/1982	12/22/1982	WIND	0.21	0.06	1041666.67	104.17	WIND
12/22/1982	12/22/1982	WINTER WEATHER	1	0	2941.18	0	SNOW
01/26/1983	01/26/1983	WINTER WEATHER	0.09	0	4545.45	0	SNOW
02/26/1983	02/26/1983	SEVERE STORM/THUNDER STORM, WIND	0.08	0	10416.67	104.17	HEAVY RAIN, WIND
01/26/1984	01/27/1984	WIND	0.13	0.07	3333.33	333.33	WIND
10/15/1984	10/15/1984	WIND	0	0	5555.56	0	WIND
02/17/1986	02/18/1986	FLOODING	0	0	500000	0	FLASH FLOODING
02/17/1988	02/17/1988	WIND	0	0.03	8620.69	0	WIND
02/05/1989	02/05/1989	WINTER WEATHER	0	0	0	128205.13	RECORD COLD
02/15/1990	02/15/1990	SEVERE STORM/THUNDER STORM, WINTER WEATHER	0	0	862.07	0	SEVERE STORM-SNOW
02/15/1990	02/15/1990	WINTER WEATHER	0	0	0	862.07	EXTREME COLD
02/15/1990	02/15/1990	WINTER WEATHER	0	0	0	86206.9	EXTREME COLD
12/20/1990	12/20/1990	WINTER WEATHER	0	0.02	0	862068.97	EXTREME COLD
12/20/1990	12/20/1990	WINTER WEATHER	0	0.05	86206.9	8620689.65	EXTREME COLD
02/05/1992	02/16/1992	WINTER WEATHER	0.22	0.12	862068.97	0	WINTER STORM
02/09/1992	02/11/1992	WINTER WEATHER	0	0	892.86	0	WINTER STORM
02/11/1992	02/13/1992	FLOODING, WINTER WEATHER	0	0	11627.91	0	WINTER STORM, FLASH FLOOD
02/14/1992	02/16/1992	FLOODING, WINTER WEATHER	0	0	9090.91	0	WINTER STORM, FLASH FLOOD
12/06/1992	12/07/1992	WINTER WEATHER	0.13	0	1562.5	0	WINTER STORM
12/08/1992	12/09/1992	WIND, WINTER WEATHER	0	0	2631.58	0	WINTER STORM, HIGH WIND
12/10/1992	12/11/1992	FLOODING, WIND, WINTER WEATHER	0	0	1315.79	0	WINTER STORM, HIGH WIND, FLASH FLOOD
12/17/1992	12/17/1992	WINTER WEATHER	0	0	3846.15	0	WINTER STORM
12/28/1992	12/29/1992	LANDSLIDE, WINTER WEATHER	0	0.11	2777.78	0	WINTER STORM, MUDSLIDE
12/31/1992	01/01/1993	WINTER WEATHER	0	0	27777.78	0	WINTER STORM
01/29/1993	01/29/1993	WIND	0	0	10000	0	HIGH WIND
10/26/1993	10/31/1993	WILDFIRE, WIND	9.89	0	36777777.8	0	HIGH WINDS, WILDFIRE
12/11/1993	12/11/1993	WINTER WEATHER	0	0	3448.28	0	WINTER STORM
01/23/1994	01/24/1994	WINTER WEATHER	0	0.04	1851.85	0	HEAVY SNOW

HAZARD BEGIN DATE	HAZARD END DATE	HAZARD TYPE	INJURIES	FATALITIES	PROPERTY DAMAGE	CROP DAMAGE	REMARKS
02/06/1994	02/08/1994	WINTER WEATHER	0	0	3333.33	0	WINTER STORM
02/16/1994	02/21/1994	WINTER WEATHER	0	0	1282.05	0	WINTER STORM
03/01/1995	03/31/1995	FLOODING, SEVERE STORM/THUNDER STORM, WIND	0	0	0	11241379.31	FLOOD, RAIN, WINDS
O08/15/1996	08/15/1996	HEAT	0	2	0	0	EXCESSIVE HEAT
12/20/1996	12/20/1996	WINTER WEATHER	0.14	0.07	0	0	HEAVY SNOW
12/22/1996	12/23/1996	FLOODING	0	0	2000	0	FLOODS
12/11/1997	12/11/1997	FOG	5.2	1	300000	0	FOG
02/02/1998	02/28/1998	FLOODING	0	0	390909.09	709090.91	FLOOD
02/03/1998	02/21/1998	FLOODING	0	1	0	0	FLOOD
02/07/1998	02/07/1998	WIND	0	0	17647.06	0	HIGH WIND
06/16/1998	06/16/1998	WIND	0	0	1000	0	HIGH WIND
10/16/1998	10/16/1998	WIND	0	0	9090.91	0	HIGH WIND
11/07/1998	11/07/1998	WIND	0	0	41176.47	0	HIGH WIND
12/05/1998	12/06/1998	WINTER WEATHER	0	0	20000	0	WINTER STORM
12/18/1998	12/18/1998	FOG	1.67	0.17	83333.33	0	FOG
12/19/1998	12/29/1998	WINTER WEATHER	0	0	0	141176.47	EXTREME COLD
01/09/1999	01/09/1999	FOG	0	0	10000	0	FOG
02/06/1999	02/07/1999	WIND	0	0	3846.15	0	HIGH WIND
04/03/1999	04/03/1999	WIND	0	0	1333.33	2600	HIGH WIND
04/22/1999	04/23/1999	WIND	0	0	1538.46	0	HIGH WIND
01/23/2000	01/24/2000	FLOODING	0	0	4000	0	FLOOD
02/11/2000	02/14/2000	FLOODING	0	0	6428.57	0	FLOOD
02/11/2000	02/14/2000	WIND	0	0	555.56	2222.22	HIGH WIND
10/21/2000	10/23/2000	WIND	0	0	1739.13	0	HIGH WIND
Totals:	**---**	**---**	**20.31**	**7.2**	**43089782.5**	**22032196.31**	**---**

(Source: Sheldus)

The tables above summarize severe weather events occurring in Amador County. Although identified as a severe weather event by these various data sources, only a few of the events identified above actually resulted in state and federal disaster declarations as previously indicated. It is further interesting to note that different data sources capture different events during the same time period, and often, different information specific to individual events. Recognizing that these inconsistencies are inherent to using existing data sources, the value of this data is in the "big picture" aspect of the story it tells, not in the individual details.

The following map, table, and photographs identifies those areas within unincorporated Amador County adversely impacted by severe weather events.


AMADOR COUNTY HAZARD EVENT MAP
Highway 88
Hwy 26
Fiddletown Rd.
Rd.
Shenandoah
Hwy 49
Hwy 88
Hwy 124
Hwy 16
Hwy 104
Latrobe Rd.
Irish Hill Rd.
Stony
Ck. Rd.
Sutter Ck.
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5 & 6
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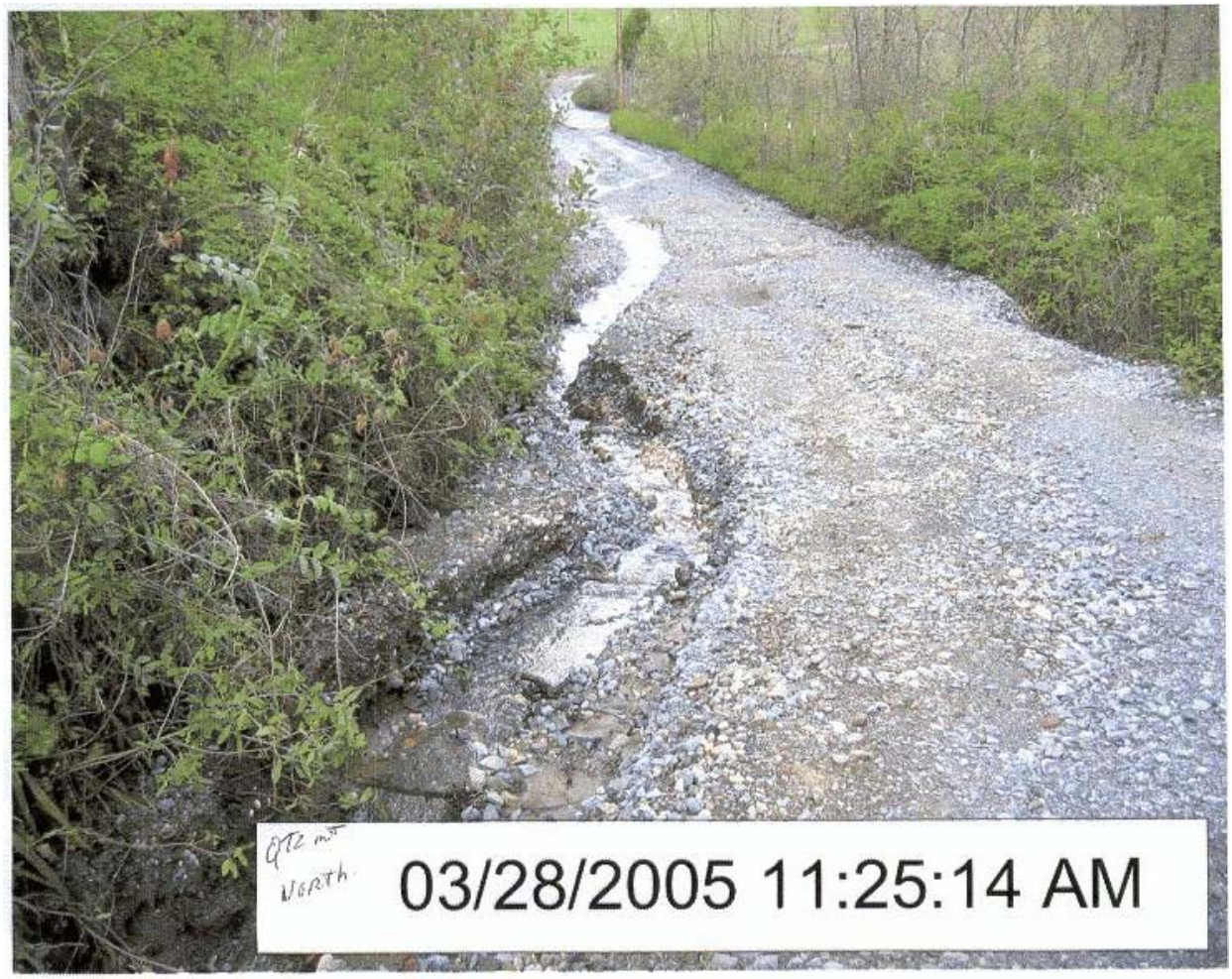
AMADOR COUNTY HAZARD EVENT MAP
ROAD LIST OF PROBLEM AREA REOCCURANCES

No.	Road Name	Usual Problems						
		Flooding	Pavement Deterioration	Washouts	High Water/ Creek Crossing	Landslides /Mudslides	Debris	Downed Trees
1	Latrobe Rd.					X		
2	Old Sacramento Rd.	X	X					
3	Spring Valley Rd.	X	X					
4	Fiddletown Rd.	X	X					
5	Quartz Mtn East	X		X	X			
6	Quartz Mtn No.	X		X	X			
7	New Chicago Rd.	X		X	X			
8	Vaira Ranch Rd	X		X	X			
9	Tonzi Rd.	X		X	X			
10	Barney Rd.	X	X					
11	Irish Hill Rd.	X	X					
12	Michigan Bar Rd.					X		
13	Carbondale Rd.	X	X					
14	Amador Creek Rd.	X		X				
15	Mayflower Rd.	X		X				
16	Turner Rd.	X		X	X			
17	Stringbean Alley	X		X				
18	Paine Rd.	X		X	X			
19	Sutter-Ione Rd.	X	X					
20	Five Mile Dr.	X	X					
21	W. Marlette	X	X					
22	Cook Rd.	X	X					
23	Old Stockton Rd.	X	X					
24	Martin Ln.	X		X				
25	Jackson Valley Rd.	X	X					
26	Camanche Rd. Brdg						X	
27	Camanche Rd.	X	X					
28	Buena Vista Rd.	X	X					
29	Coal Mine Rd.	X		X	X			
30	Curran Rd.	X	X					
31	Camanche Pkwy No.		X			X		
32	Maxwell Rd.	X	X					
33	Bell Rd.	X	X					
34	Ostrom Rd.	X	X					
35	Shakeridge Rd.					X		
36	Hale Rd.	X			X			
37	Charleston Rd.					X		
38	Rams Horn Grade					X		
39	Sutter Creek Rd.	X	X		X	X	X	
40	Pine Grove/Volcano Rd.	X					X	
41	Climax Rd.					X		
42	New York Ranch Rd.	X						
43	Argonaut Ln.	X	X					
44	Clinton Rd.				X			
45	Butte Mtn. Rd.				X			
46	Middle Bar Rd.					X		X
47	Electra Rd.				X	X		
48	West Lake Road							X
49	Kit Carson Rd.			X				

Photos (courtesy of the Amador County Department of Public Works) of some of these problem areas are included below.

Tonzi Road (Site #9)

Old Sacramento Road (Site #2)



Quartz Mountain Road (Site #6)

Almost all of Amador County's state and federal disaster declarations are a direct result of extreme weather conditions. For this plan, severe weather is discussed in the following subsections:

- Extreme Temperatures
- Fog
- Heavy Rains/Thunderstorms/Wind/Lightning
- Snow
- Tornadoes

Weather conditions can vary greatly from the western portion to the eastern portion of Amador County due to topographical changes and variance in elevation. Therefore, for the purpose of this section, the County will be described as two distinct sections: (1) western Amador County, which generally falls below the snowfall region and ranges in elevation from near sea level at Ione to an estimated 2,500 feet above sea level at Pine Grove, and includes the area of Pine Grove and the land to the west; and (2) eastern Amador County, which ranges in elevation from

an estimated 2,500 feet above sea level at Pine Grove to Kirkwood with a peak elevation of 12,000 feet above sea level, and includes areas of the County east of Pine Grove. Analyzing the affects of severe weather topographically, assists the County in determining where the risk varies across the planning area.

Specifically, data obtained from the Western Regional Climate Center for two weather stations were analyzed based on the location of the stations and the availability of data associated with those stations. The first weather station, Twin Lakes, represents the eastern portion of the county. This station, with an elevation of approximately 7,840 feet above msl is actually located in Alpine County on the Amador County border, but is most representative of the higher elevations of eastern Amador. The station used to analyze data for the western portion of the County is the Sutter Hill Ranger Station, with an elevation of 1,580 feet above msl.

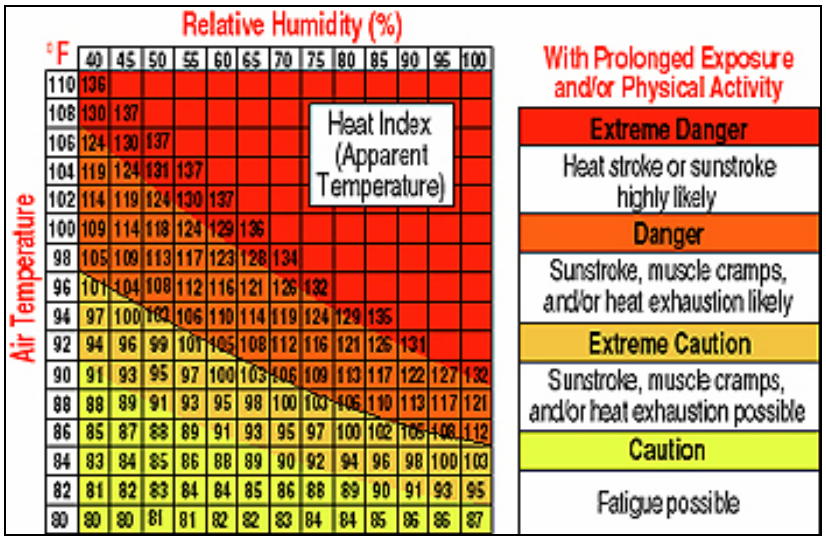
Extreme Temperatures

Extreme temperature events, both hot and cold, can have severe impacts on human health and mortality, natural ecosystems, agriculture and other economic sectors.

Extreme Heat

According to information provided by the FEMA website, 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, tornadoes, 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. The following graphic illustrates the relationship of temperature and humidity to heat disorders.



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. (Source: National Weather Service, 2004)

The NWS has in place a system to initiate alert procedures (advisories or warnings) when the Heat Index (HI) 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 HI is expected to equal or exceed 105°F and a nighttime minimum HI of 80°F or above for two or more consecutive days.

Extreme Cold

Extreme cold often accompanies a winter storm or is left in its wake. Prolonged exposure to 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.

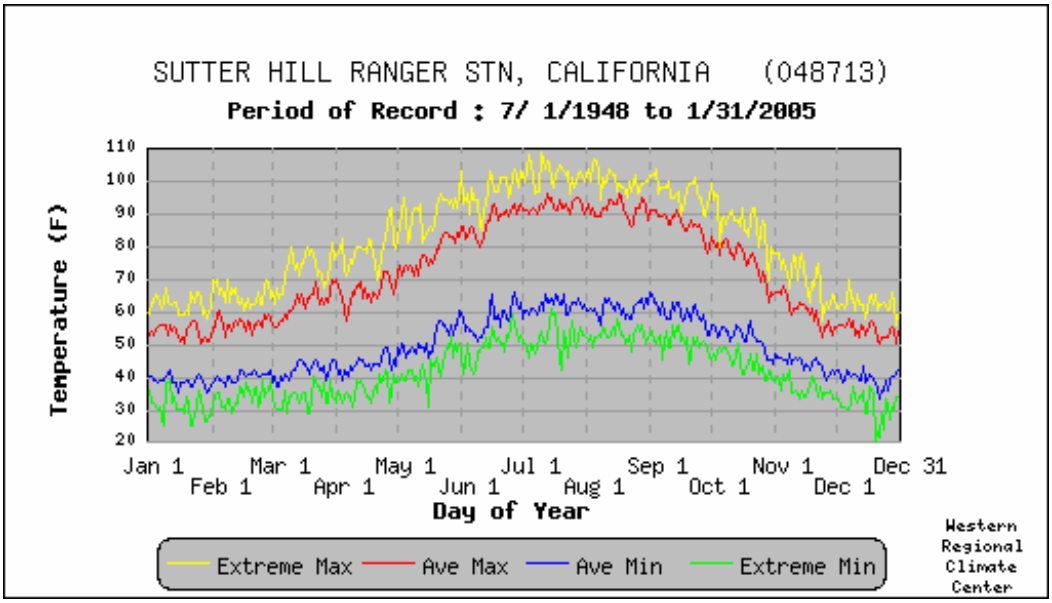
In 2001, NWS implemented an updated Wind Chill Temperature (WTC) index. This index was developed by the NWS to describe the relative discomfort/danger resulting from the combination of wind and temperature. Wind chill is based on the rate of heat loss from exposed skin caused by wind and cold. As the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

The NWS will issue a wind chill advisory for foothill counties when temperatures are expected to drop to 40 below 0. For the central valley, an advisory is issued only when it gets to be 25 degrees below 0 for 3 hours or more.

Past Occurrences

An analysis of temperature ranges in western and eastern Amador County is provided in the following sections.

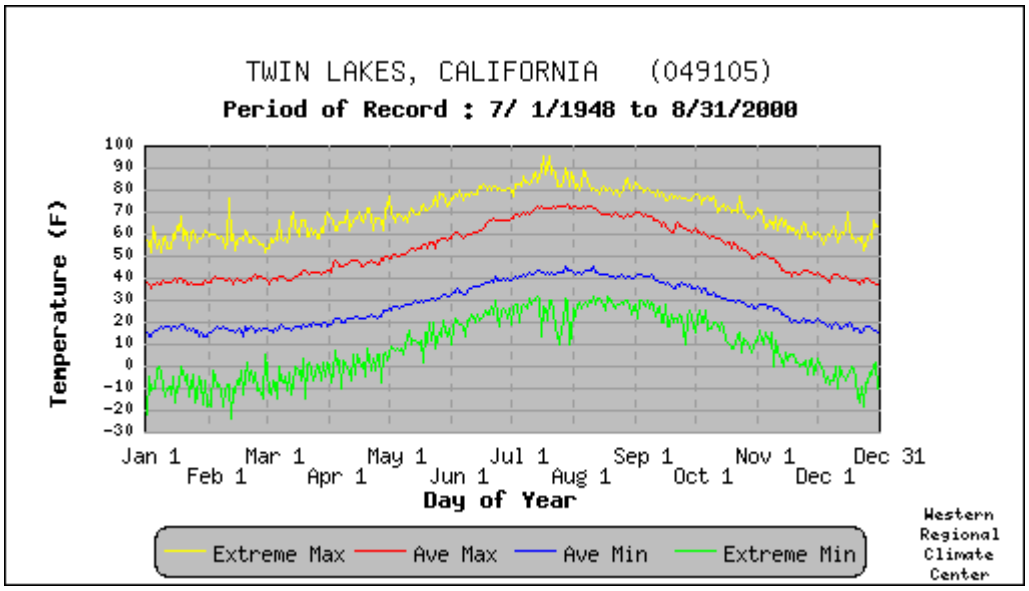
Western Amador County (Sutter Hill Ranger Station -Period of Record 7/1/1948 to 1/31/2005). In western Amador County, monthly average maximum temperatures in the warmest months (May through October) range from the mid 70's to the low 90's. Monthly average minimum temperatures from November through April range from the high 30's to the low 40's. The highest recorded daily extreme in western Amador County is 109 degrees Fahrenheit (°F) on July 10, 2002. The lowest recorded daily extreme is 20°F on December 20, 1998. For the period of record (POR) for maximum temperature extremes (on an annual basis), 70.3 days exceeded 90°F and no days were less than 32°F. For the POR for minimum temperature extremes (on an annual basis), 12.5 days were less than 32°F and no days were less than 0°F.



- Extreme Max. is the maximum of all daily maximum temperatures recorded for the day of the year.
- Ave. Max. is the average of all daily maximum temperatures recorded for the day of the year.
- Ave. Min. is the average of all daily minimum temperatures recorded for the day of the year.
- Extreme Min. is the minimum of all daily minimum temperatures recorded for the day of the year.

Eastern Amador County (Twin Lakes Weather Station-Period of Record 7/1/1948 to 8/31/2000). In eastern Amador County, monthly average maximum temperatures in the warmest months (May through October) range from the low 50's to the low 70's. Monthly average minimum temperatures from November through April range from the mid teens to low 20's. The highest recorded daily extreme in eastern Amador County is 95°F occurring on July 17, 1998. The lowest recorded daily extreme is -24°F occurring on February 12, 1949. For the period of record (POR) for maximum temperature extremes (on an annual basis), one day

exceeded 90°F and 36.5 days were less than 32°F. For the POR for minimum temperature extremes (on an annual basis), 227.8 days were less than 32°F and 7.0 days were less than 0°F.



- Extreme Max. is the maximum of all daily maximum temperatures recorded for the day of the year.
- Ave. Max. is the average of all daily maximum temperatures recorded for the day of the year.
- Ave. Min. is the average of all daily minimum temperatures recorded for the day of the year.
- Extreme Min. is the minimum of all daily minimum temperatures recorded for the day of the year.

The HMPC was not aware of any specific deaths, injuries or damages related to extreme temperatures.

Likelihood of Future Occurrences

Highly Likely: Given the history of extreme climate occurrences in Amador County, extreme temperature events have occurred and will continue to occur on an annual basis.

Fog

Fog results from air being cooled to the point where it can no longer hold all of the water vapor it contains. For example, rain can cool and moisten the air near the surface until fog forms. A cloud-free, humid air mass at night can lead to fog formation, where land and water surfaces that have warmed up during the summer are still evaporating a lot of water into the atmosphere—this is called 'radiation fog'. A warm moist air mass blowing over a cold surface can also cause fog to form—this is called 'advection fog'. Severe fog incidents can close roads, cause accidents, and impair the effectiveness of emergency responders.

Past Occurrences

The NCDC data shows no severe fog incidents for Amador County; however, the USC Sheldus data shows three incidents of severe fog. No damages associated with fog events were identified for the County.

Likelihood of Future Occurrences

Occasional: Using the Sheldus data, three fog incidents over a 40 year period equates to an average of one fog event every 13.3 years, or a 7.5% chance of a fog event any given year. Based on input from the HMPC, it is likely that minor fog events will continue to occur annually in the Amador County planning area.

Heavy Rain/Thunderstorms/Wind/Hail/Lightning

Severe storms/thunderstorms in the planning area generally include heavy rains often accompanied by strong winds, lightning, and hail. Tornadoes and funnel clouds can occur during these types of storms although it is a rare occurrence in Amador County. Thunderstorms can produce a strong rush of wind known as a downburst, or straight-line winds which may exceed 120 miles per hour. These storms can overturn mobile homes, tear roofs off of houses and topple trees.

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: (1) Hail, three-quarters inch or greater; (2) Winds gusting in excess of 50 knots (57.5 mph); or (3) A tornado.

High winds often accompany thunderstorms. High winds can result in property damage and injury. Strong gusts can rip roofs from buildings, snap power lines, shatter windows, down trees, and sandblast paint from cars. Other associated hazards include utility outages, arcing power lines, debris blocking streets, dust storms, and an occasional structure fire from this natural hazard.

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 usually associated with severe summer storms which occur throughout the late fall, winter, and spring seasons within the Amador County planning area. Hailstones are usually less than 2 inches in diameter and can fall at speeds of 120 mph. Severe hailstorms can be quite destructive causing damage to roofs, buildings, automobiles, vegetation, and crops.

Lightning is defined as any and all of the various forms of visible electrical discharge caused by thunderstorms. Thunderstorms and lightning can occur throughout the year and are not always accompanied by rain. Cloud-to-ground lightning can kill or injure people by direct or indirect means. Objects can be directly struck and this impact may result in an explosion, burn, or total

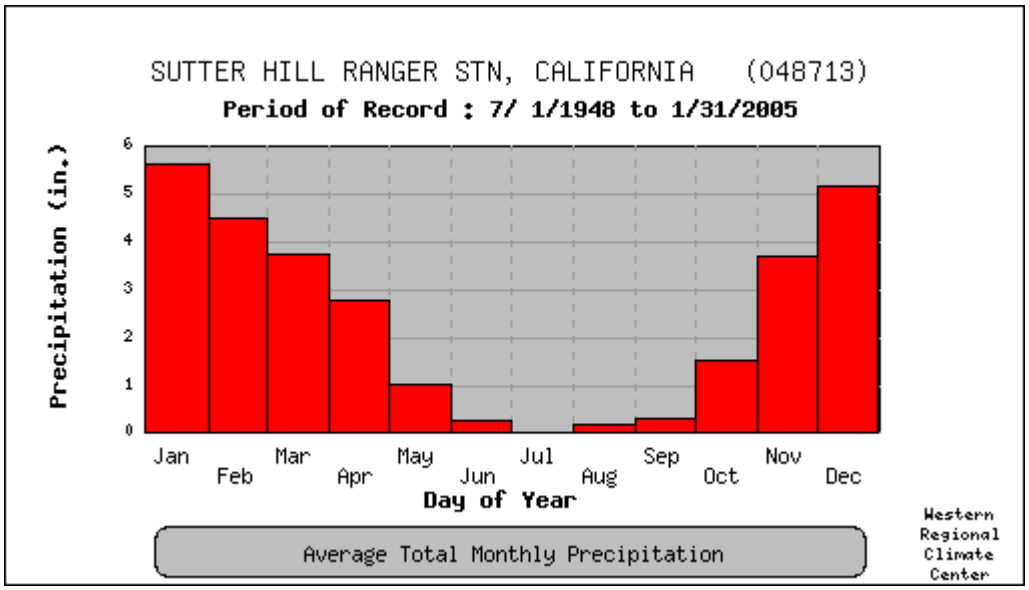
destruction. Or, damage may be indirect when the current passes through or near it an object, generally resulting in less damage.

Past Occurrences

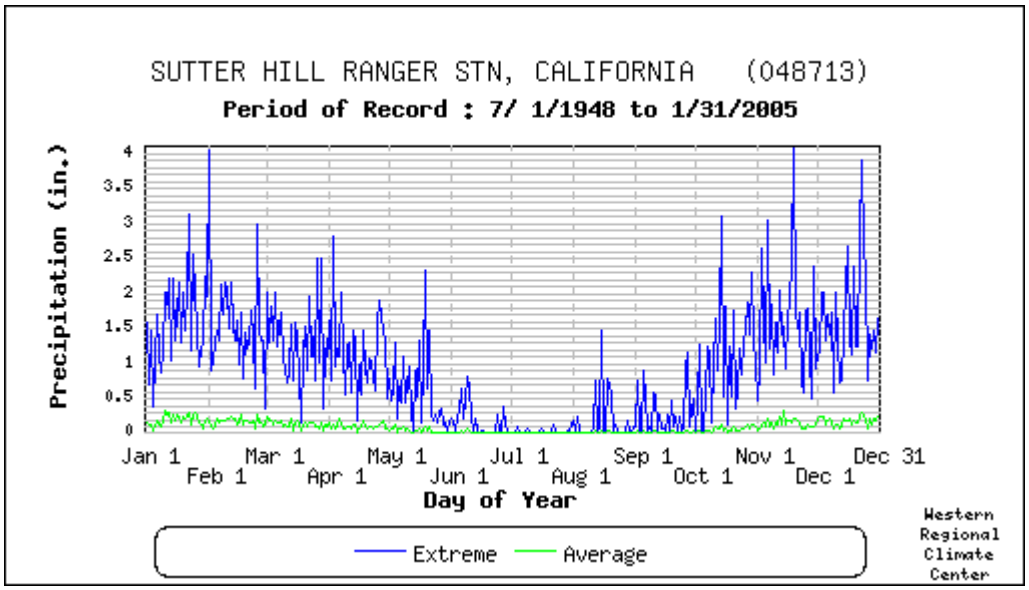
As discussed further in the following sections, heavy rains and severe storms occur in Amador County primarily during the late fall, winter and spring seasons.

Heavy rain is the most frequent type of severe weather occurrence within the County. The bulk of rain occurs during the months of November through April but can be quite variable depending on different regions of the County. Due to the dramatic change in elevation from the western portion of Amador County to the eastern limit (from approximately 100 feet to more than 12,000 feet above msl), precipitation, like temperature, varies greatly throughout the County. Information obtained from the Sutter Hill and Twin Lakes weather stations are provided below.

Western Amador County (Sutter Hill Ranger Station—Period of Record 7/1/1948 to 1/31/2005). Average annual precipitation in western Amador County is 28.62 inches per year. The highest recorded annual precipitation for western Amador is 46.19 inches in 1950; the highest recorded precipitation for a 24-hour period is 4.08 inches on November 19, 1950. The lowest annual precipitation total is 10.17 inches in 1976.

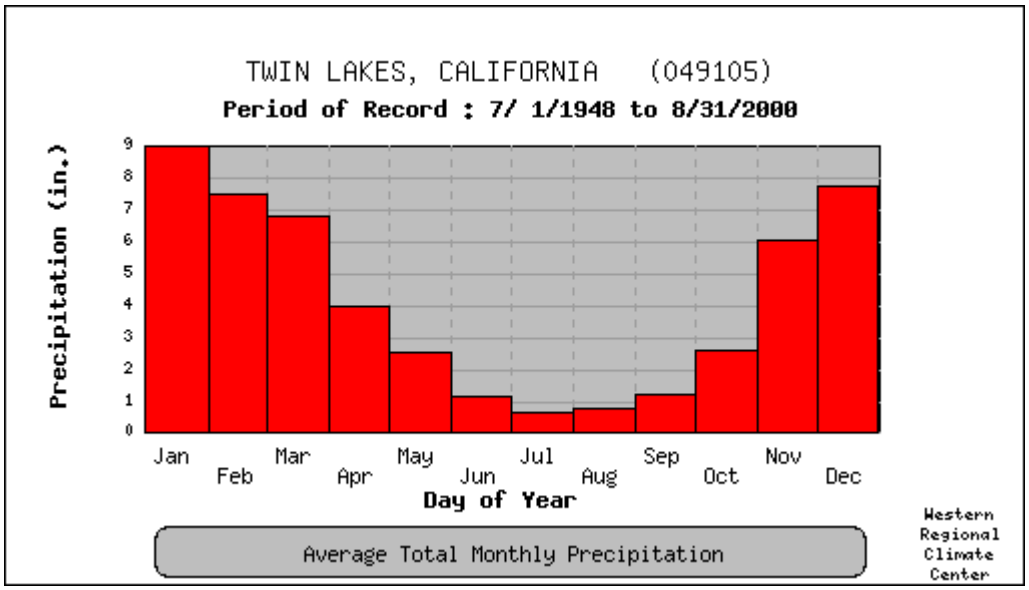


- Average precipitation recorded for the month.

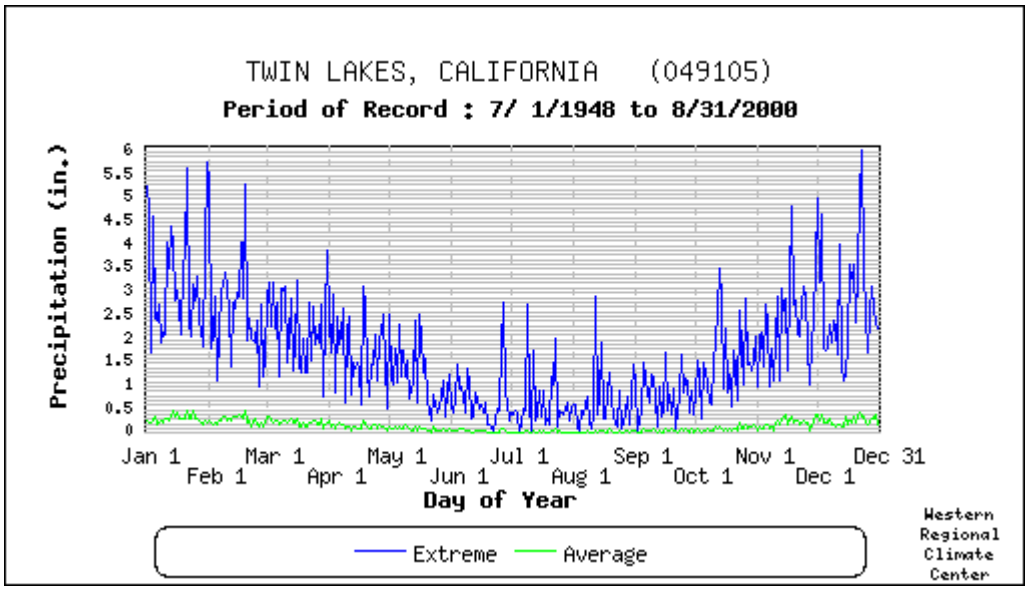


- Extreme is the greatest daily precipitation recorded for the day of the year.
- Average is the average of all daily precipitation recorded for the day of the year.

Eastern Amador County (Twin Lakes Weather Station—Period of Record 7/1/1948 to 8/31/2000). Average annual precipitation in eastern Amador County is 49.60 inches per year. The highest recorded annual precipitation for eastern Amador is 85.21 inches in 1983; the highest recorded precipitation for a 24-hour period is 6.01 inches on December 23, 1955. The lowest annual precipitation total is 23.51 inches in 1976.



- Average precipitation recorded for the month.



- Extreme is the greatest daily precipitation recorded for the day of the year.
- Average is the average of all daily precipitation recorded for the day of the year.

Extreme weather events associated with Heavy Rain/Thunderstorms/Wind/Hail/Lightning include those specific events listed in the previous tables included in this section in addition to those detailed by the HMPC and presented below.

Annually, from January through April, heavy rains in both higher and lower elevations have caused widespread street flooding, closures of roadways at creek crossings, minor landslides, and washouts of road shoulders and gravel roadways. The potential for high winds accompanying these storms is great. Saturated ground coupled with these winds creates a perfect scenario for fallen trees blocking roadways. The valley area is home to very large oak trees. The foothill and mountain areas contain large oak, cedar, pine and tamarack trees. Fallen trees cause temporary road closures until crews can respond and remove them. Depending on the ferocity of the storm, crews may respond to from 5 to 30 different calls. Downed power lines further complicate tree removal and reopening roadways to traffic.

Annually, from May through September, Amador County may receive severe thunderstorms which cause flooding problems.

Annually, from October through December, Amador County has the most potential for high wind events. Once again, fallen trees are a major concern countywide. As late fall/early winter approaches, the rain and wind cycle begins again.

In 1995, 1997 and 1998, Amador County received State and FEMA funding for storms that were declared national disasters. The 1995 storms were in January and March. The total for both storms were $502,000 from FEMA and $213,997 from the State. The 1997 storm FEMA monies were $497,791 and State totaled $156,934. For the 1998 storms, FEMA funds were

$102,343 and State funds were $34,220. These same areas for which Amador County received previous funding continue to be battered by heavy storms and are a problem even in non-national disaster level storms.

Likelihood of Future Occurrences

Highly Likely: Severe weather, including thunderstorms, heavy rain, hail, wind and lightning is a well documented seasonal occurrence that will continue to occur annually in the Amador County area.

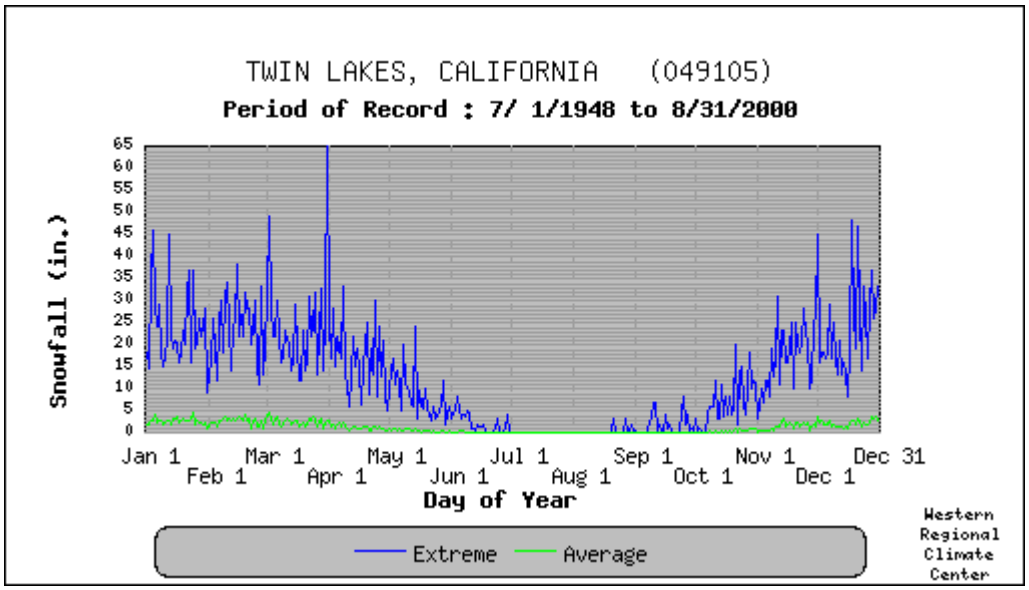
Snow

The western portion of Amador County does not receive snowfall on a regular seasonal basis; however, the eastern portion of the County receives an abundance of snow, mostly between the months of October and April.

Western Amador County (Sutter Hill Ranger Station—Period of Record 7/1/1948 to 1/31/2005). Between the period from 1914 to 2002 and based on the sum of monthly averages, western Amador at the Sutter Hill Ranger Station received an annual average of 1 inch of snow per year. Although in 1968, western Amador received 9 inches of snow for the year. For the POR, only 11 of the years received any measurable snowfall. There has been no measurable snowfall in western Amador since the winter of 1968-1969.

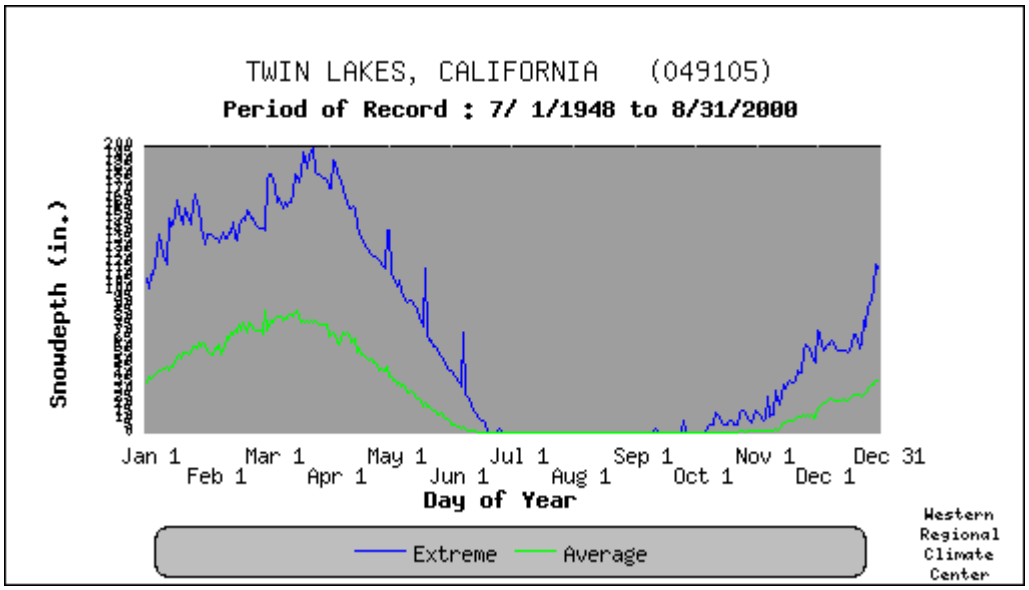
Eastern Amador County (Twin Lakes Weather Station—Period of Record 7/1/1948 to 8/31/2000). On the other extreme, the eastern limit of the County (at the Twin Lakes weather station) receives 401.1 inches of snow on average with a record annual snowfall of 663 inches in 1951 to 1952. The lowest annual snowfall on record is 163 inches in 1958 to 1959. The months of December, January, February, and March account for the most snowfall. The average annual snowdepth in eastern Amador is 26 inches. Snow depth averages generally range from 23 inches in May to 78 inches in March.

Twin Lakes
Daily Snowfall Average and Extreme



- Extreme is the greatest daily snowfall recorded for the day of the year.
- Average is the average of all daily snowfall recorded for the day of the year.

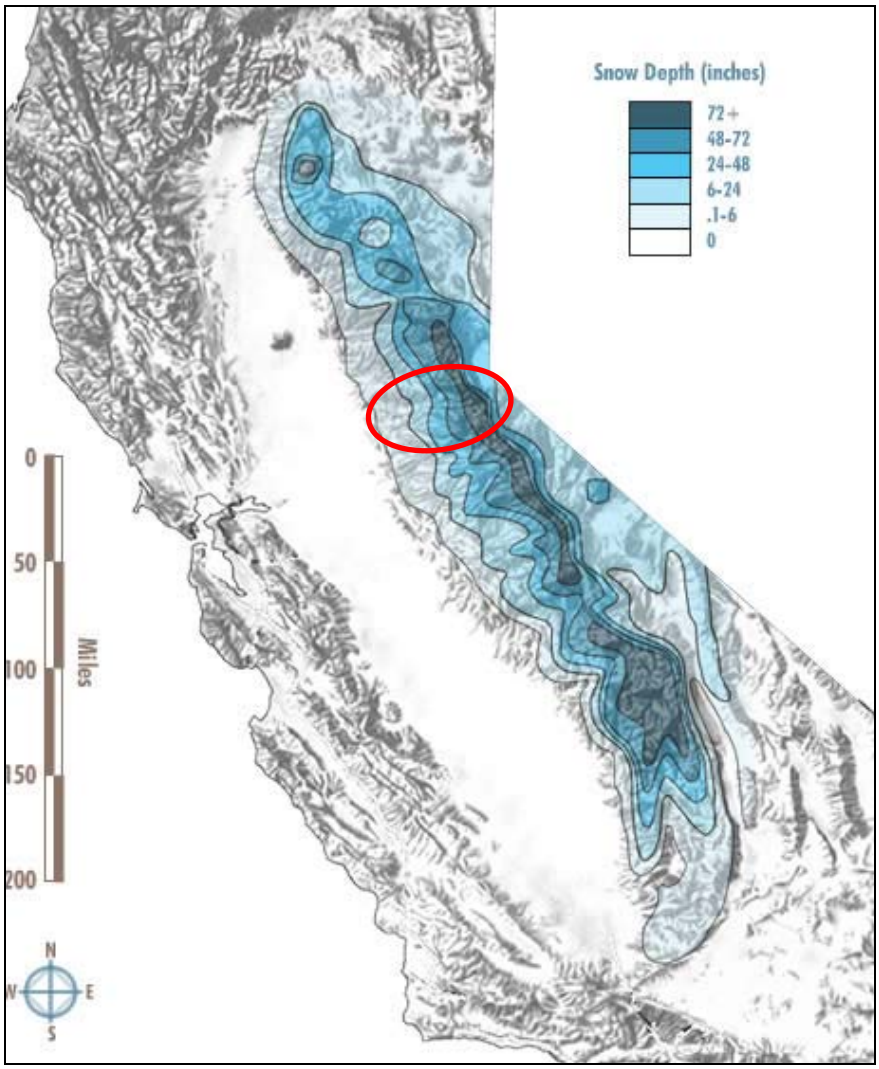
Twin Lakes
Daily Snowdepth Average and Extremes



- Extreme is the greatest daily snowdepth recorded for the day of the year.
- Average is the average of all daily snowdepth recorded for the day of the year.

Snowfall in the Sierras increases with elevation. The lower foothills rarely receive any measurable snow. Middle elevations receive a mix of snow and rain during the winter. Above about 6,000 ft., 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.

The following map shows the average maximum measured snow depth in the Sierra Nevada for the month of March (the month of greatest average snow depths).



(Source: http://www.sierranevadaphotos.com/geography/snow_depth.asp)

Past Occurrences

The heavy levels of snow in eastern Amador County combined with other inclement weather in the western portion of Amador County create many issues that impact the area.

Extreme weather events associated with snow and blizzard events include those listed in previous tables and occur almost on an annual basis. Winter storms occur countywide and

involve heavy rains, snow, ice, and high winds causing downed trees and power lines, power outages, accidents, and road closures. There are typically few injuries and limited damages. Most problems arise from downed trees and power lines. There have been instances where the Amador County Road Department crews have plowed non-stop for 72+ hours. Significant, recent winter storms in the County include those occurring on the following dates:

- December 2003
- February 2004
- November 2004
- December 2005
- January 2005
- January 2006

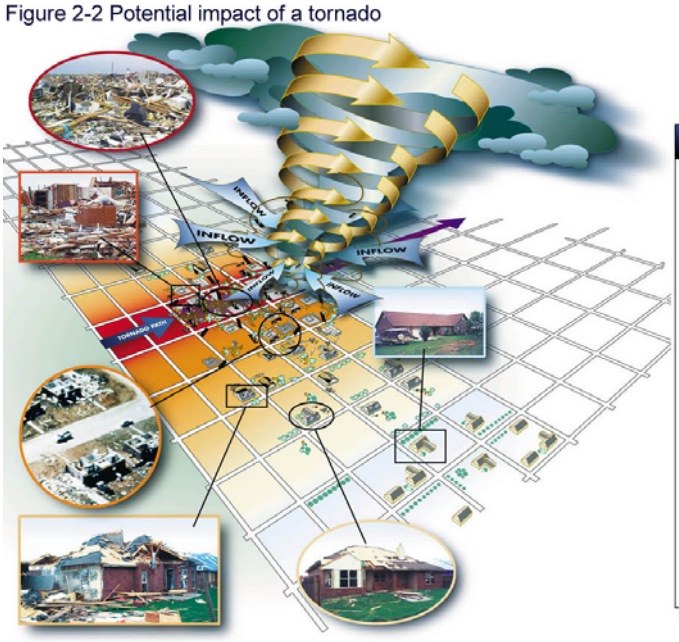
Likelihood of Future Occurrences

Highly Likely: Based on historic data for Amador County, severe snow and winter weather events are well documented occurrences that will continue to occur on an annual basis in Amador County.

Tornadoes

Tornadoes are another weather-related event with a potential to affect Amador County. Tornadoes are rotating columns of air marked by a funnel-shaped downward extension of a cumulonimbus cloud whirling at destructive speeds of up to 300 mph, usually accompanying a thunderstorm. Tornadoes are the most powerful storms that exist. They can be comprised of the same pressure differential that fuels 300-mile wide hurricanes across a path only 300 yards wide or less.

Figure 2-2 Potential impact of a tornado



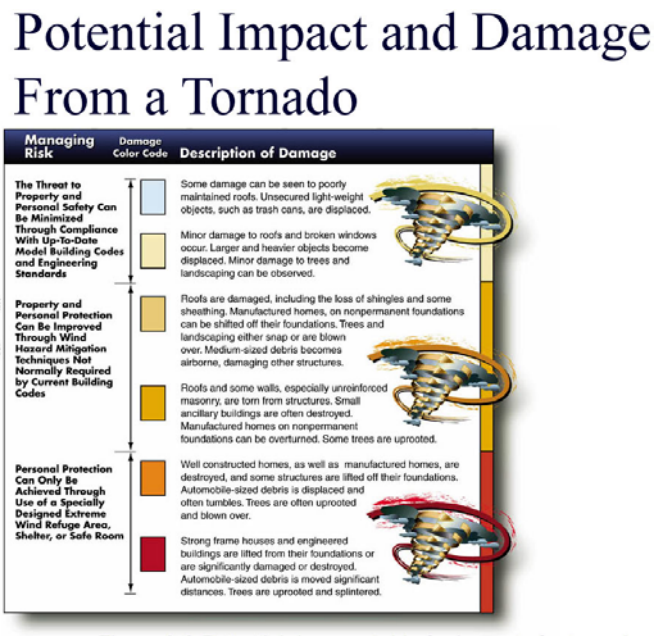


Figure 2-2 Potential damage table for impact of a tornado

Tornado magnitude is ranked according to the Fujita scale listed as follows:

Fujita Tornado Scale
F0: 40 - 72 mph (35-62 kt)
F1: 73-112 mph (63-97kt)
F2: 113-157 mph (137-179 kt)
F3: 158-206 mph (137-179 kt)
F4: 207-260 mph (180-226 kt)
F5: 261-318 mph (227-276 kt)

Past Occurrences

According to the HMPC, tornadoes are rare and are likely to only affect the lower elevations in the western portion of the County. There are no documented incidents of tornadoes in Amador County. However, the HMPC reported that funnel clouds are occasionally sighted during thunderstorm weather.

Likelihood of Future Occurrences

Based on data from 1950 – 1995, California ranks 32 of 50 (compared to other states) for frequency of tornadoes, ranking 36 for injuries and 31 for cost of damages. When compared to other states by the frequency per square mile, California ranks number 44 for the frequency of tornadoes, 44th for injuries per area and 40th for costs per area.

Unlikely: There have been no documented incidents of tornadoes in the County. However, Amador County will likely continue to experience the formation of funnel clouds during adverse weather conditions; it is, however, unlikely that tornadoes resulting in significant damage will occur.

FLOOD

Floods can be among the most frequent and costly natural disaster in terms of human hardship and economic loss, and can be caused by a number of different weather events. Floods can cause substantial damage to structures, landscapes, and utilities as well as life safety issues. Certain health hazards are also common to flood events. Standing water and wet materials in structures can become a breeding ground for microorganisms such as bacteria, mold, and viruses. This can cause disease, trigger allergic reactions, and damage materials long after the flood. When floodwaters contain sewage or decaying animal carcasses, infectious disease is of concern. Direct impacts such as drowning can be limited with adequate warning and public education about what to do during floods. Where flooding is in populated areas, warning and evacuation will be paramount to reduce life and safety impacts with any type of flooding. Amador County is susceptible to various types of flood events as described below.

Riverine flooding is defined as when a watercourse exceeds its “bank-full” capacity and is usually the most common type of flood event. Riverine flooding generally occurs as a result of prolonged rainfall, or rainfall that is combined with already saturated soils from previous rain

events. This type of flood occurs in river systems whose tributaries may drain large geographic areas and include many independent river basins. 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 will assist 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. Once flooding begins, personnel will be needed to assist in rescuing persons trapped by flood waters, securing utilities, cordoning off flooded areas, and controlling traffic. This can overtax local response capabilities and require outside mutual aid.

Urban flood events have resulted as land is converted from fields or woodlands to roads and parking lots and loses its ability to absorb rainfall. Urbanization increases runoff 2-6 times over what would occur on natural terrain. During periods of urban flooding, streets can become swift moving rivers, while basements can become death traps as they fill with water.

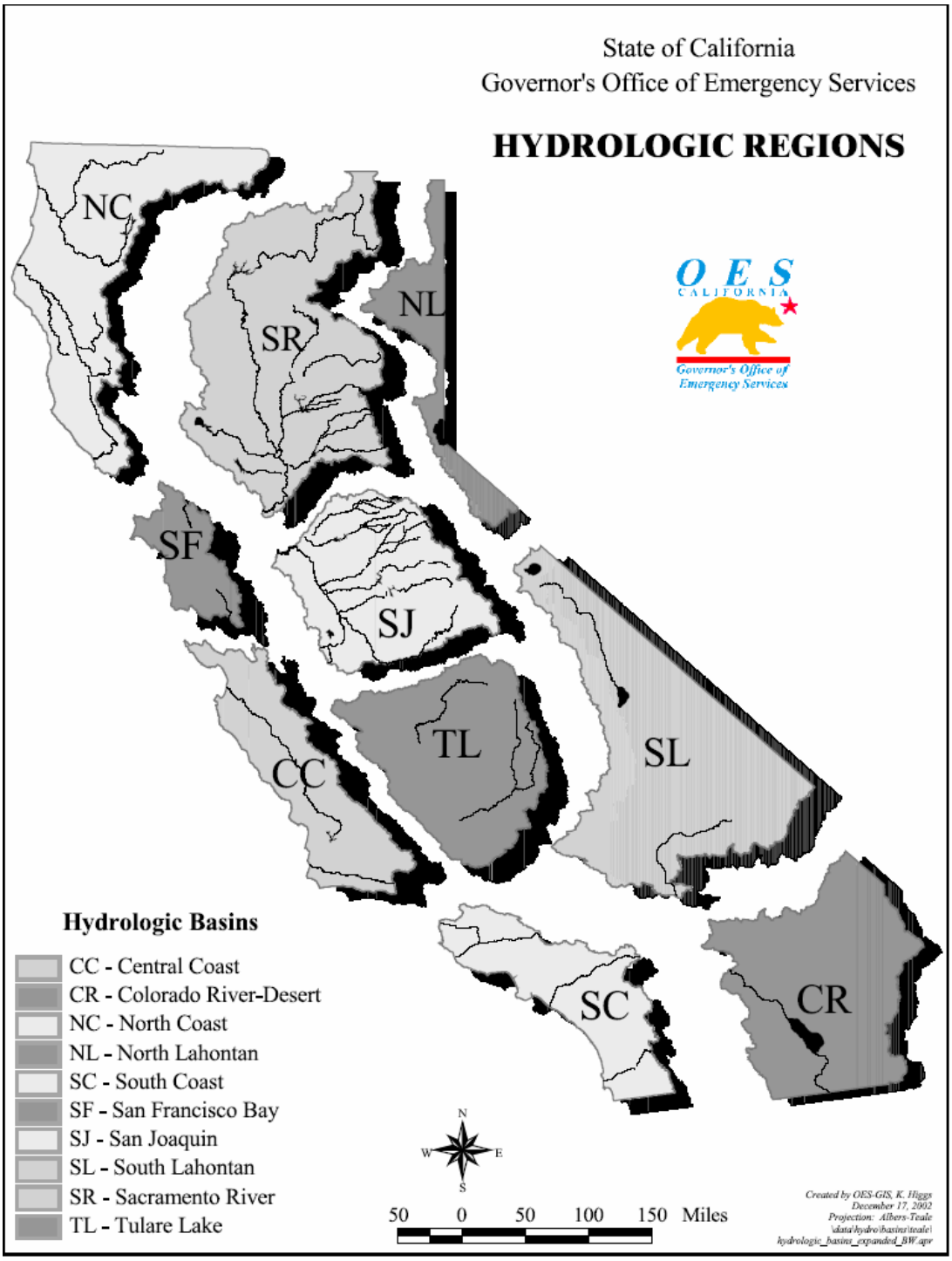
Other types of floods include general rain floods, thunderstorm floods, snowmelt and rain on snow floods, dam failure floods, and local drainage floods.

The area adjacent to a 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). 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. A change in environment 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.

Major Sources of Flooding

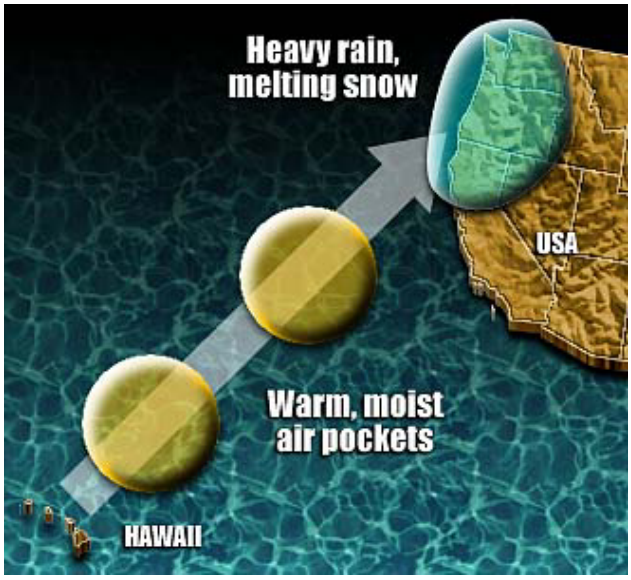
California has 10 hydrologic regions. Amador County sits in the San Joaquin hydrologic region. This region encompasses the middle portion of the Central Valley bounded by the Sierra Nevada Mountains, the Coast Range, the divide between the American and Consumnes river watersheds, and the divide between 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 on the next page.



Amador 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 Amador 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.

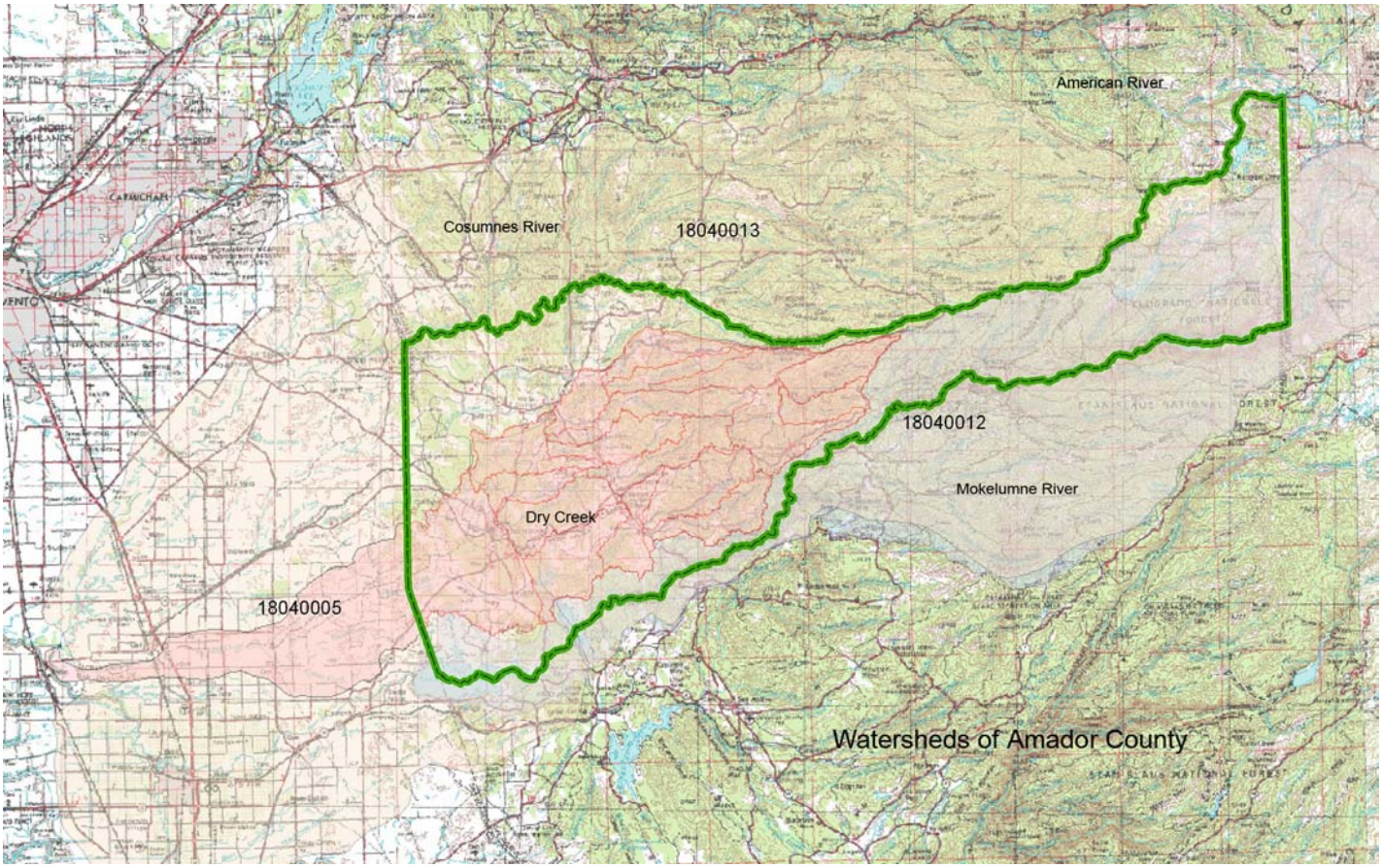
'Pineapple express' brings warm air, rain to West. A relatively common weather pattern brings southwest winds to the Pacific Northwest or California, along with warm, moist air. The moisture sometimes produces many days of heavy rain, which can cause extensive flooding. The warm air also can melt the 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.



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

The Watershed System

Amador County crosses three primary watersheds: Mokelumne, Consumnes, and Dry Creek. The Dry Creek Watershed is the primary source of flooding within the county. Amador County watersheds are illustrated in the map on the following page.



(Source:CSRC&D)

Dry Creek Watershed. The Dry Creek watershed, an integral part of the Bay Delta System, covers more than 300 square miles, including 128 miles of streams, between the Upper Mokelumne River watershed and the Upper Cosumnes River, primarily in Amador County.

The Dry Creek Watershed Assessment project, initiated in 2005, will address concerns expressed by watershed stakeholders, which include improving water quality, water supply reliability, and ecosystem quality in the watershed. A major phase of this project will result in formal watershed management plan and identification and implementation of corrective measures to protect and restore the Dry Creek watershed. The project area includes upper Dry Creek (Jackson Creek, Sutter Creek, Amador Creek, and others) and southern portions of the Cosumnes River Watershed (Cedar Creek, South Fork Cosumnes River, Scott Creek, Big Indian Creek, and others), areas primarily in Amador County or up stream from the community of River Pines.

Mokelumne Watershed. The Mokelumne River Watershed in Amador, Calaveras and Alpine Counties is a significant source of water for both consumption and energy production. The major land use in the upper watershed, owned both privately and publicly, is timber management. The cumulative effects of timber harvest on the beneficial downstream uses of water in this area has developed into an issue of growing importance. The East Bay Municipal Utility District (EBMUD) provides drinking water for 1.1 million customers in the San Francisco East Bay Area. The source of supply is the 585 square mile Mokelumne River watershed in the central

Sierras. Runoff from the watershed is impounded in Pardee Reservoir, located in Amador and Calaveras counties, and is transported across the Central Valley by three aqueducts.

The Mokelumne River Basin is a relatively narrow and steep watershed. Elevations range from 570 feet at Pardee Dam to about 10,400 feet on the highest peaks within the basin. Annual precipitation and stream flow in the Mokelumne River Basin are extremely variable from month to month and from year to year. Most precipitation normally falls between November and May and very little falls between late spring and late fall. Peak flows in the Mokelumne River normally occur during winter storms or during the spring snowmelt season from March through June. Flows taper off to a minimum in late summer or fall. Snowmelt from parts of Alpine, Amador, and Calaveras counties contribute to the Mokelumne River. The primary tributaries are the North, Middle and South Forks of the Mokelumne River, with the North Fork tributary draining over 80 percent of the Mokelumne watershed. Lesser tributaries include Summit Creek, Bear Creek, Cole Creek, Moore Creek, Blue Creek, Tiger Creek, Panther Creek, Forest Creek and Licking Fork.

The majority of the Mokelumne River watershed consists of open space and forest land with small concentrations of residential development and large tracts of designated wilderness. There are small agriculture areas, mainly orchards and vineyards, and several areas of recreational developments (including winter sports facilities). The watershed contains little area devoted to industrial or commercial use.

Historic impacts to the watershed include gold mining, deforestation, and livestock grazing. Current impacts include logging, grazing, deliberate and incidental toxic substance dumping, loss of wildlife habitat, low flow water quality, recreation, roadways, residential development, domestic wastes, and more.

Recently, a grant was awarded to the Upper Mokelumne River Watershed Authority (UMRWA) for a watershed assessment and watershed plan development within the Upper Mokelumne River watershed. This is the most current project involved in improving water quality and overall management of the Upper Mokelumne River Watershed. The two-phased project is expected to be complete in March of 2008.

Consumnes Watershed. The Cosumnes River Watershed includes Amador, El Dorado and Sacramento Counties and drains a total of 936 square miles. The Cosumnes River, at a length of 80 miles, is considered the last untamed, free flowing river system west of the Sierra Nevada Mountains. The river has a natural flow regime, drying up in drought years and flooding in wet years. In the Upper Cosumnes River Watershed, beginning at approximately 7,600 feet msl in the Sierra Nevada Range, the river flows through bedrock formations, confining the river to basically a permanent channel. In the Lower Watershed, the river has meandered over time leaving behind deposits of fertile soil resulting in the creation of wetlands and streamside riparian habitat. The South Fork of the Cosumnes River runs through northern Amador County. The watershed empties into the Mokelumne River and is an integral part of the Sacramento Bay Delta ecosystem.

In the early 1900's, agriculturists began intensively farming and ranching the land throughout the lower watershed. Levees were established along the river to help contain the occasional high flow event, allowing the land to be farmed year round. This pattern of land use remained relatively constant through the last decade; however, flooding has become a more significant issue with the increased cost and value of agricultural operations. In addition to agriculture, a significant number of homes, communities, business, roads and other infrastructure exist within the watershed. Privately owned levees, originally built to control flooding, have over time become aged and less stable. A break in a levee along the Cosumnes today not only impacts agricultural lands but results in flooded homes and businesses as well as damage to public roads, utilities, transportation and emergency services. Impacts to the Southern California water supply may also occur. A USACE conducted a Reconnaissance Study of the lower watershed in 1999 and identified several issues including levee failure and flooding; erosion and channel incision; excessive sediment transport and degradation of the riverbed; constriction of the floodplain; isolation of the floodplain from the river channel; reduction of flows in summer and fall; and loss of aquatic and riparian habitat.

River flows are almost entirely a result of rainfall. Only 16 percent of the watershed lies above 5,000 feet; therefore, snowmelt contributes very little to stream flows. The river flows year-round in the upper watershed; however, in the lower watershed, flows are intermittent during the summer. Flooding on the Cosumnes usually occurs November through April, generally as a result of heavy rains. According to the Cosumnes River Task Force Plan, peak flow years include: 1907, 1950 (27,600 cfs), 1955 (42,000 cfs), 1958 (29,300 cfs), 1963 (39,400 cfs), 1964 (37,500 cfs), 1980 (34,200), 1982 (37,000 cfs), 1986 (45,000 cfs), and 1997 (93,000 cfs). According to the 1999 study, the levees can hold a 5-year storm event of approximately 20,000 cfs. Flooding frequency is the greatest near the confluence with the Mokelumne; although most of the areas surrounding the river experience occasional or rare flooding frequency.

In 1997, the Cosumnes River Watershed experience the largest flood event on record. Peak discharge was 93,000 cfs, 47,900 cfs more than the previously recorded high flow event of 1986. Approximately 34,000 acres of primarily farmland was inundated. Almost $7 million dollars in business losses occurred to orchards, vineyards, row and field crops and dairies. Agricultural losses to private property were estimated at $13 million. Most of the 1997 flood damage was associated with levee breaks. 82 homes or structures valued at $1.7 million were also damaged during the 1997 flood. Many bridges and roads were impassible and many incurred varying degrees of damage.

Past Occurrences

Historically, portions of Amador County have always been at risk to flooding because of its high annual percentage of rainfall, the number of watercourses that traverse the County, and the location of development adjacent to flood-prone areas. Flooding events generally occur countywide, and have caused significant damage in the western portion of the county near population centers, especially in the incorporated areas of City of Jackson, Ione, and Sutter Creek. Flooding has occurred, both within the 100-year floodplain and in other localized areas.

According to the 2004 Draft California Multi-Hazard Mitigation Plan, Amador County has experienced seven California proclaimed states of emergency for flood events between 1950 and 1997 as evidenced in the map on the following page. Also, according to the State Plan, between 1955 and 2002, Amador County has experienced 10 federally declared storm or flood disasters.

The state plan also summarized flood damage by program or claim type. Taken from the state plan, this information is detailed below.

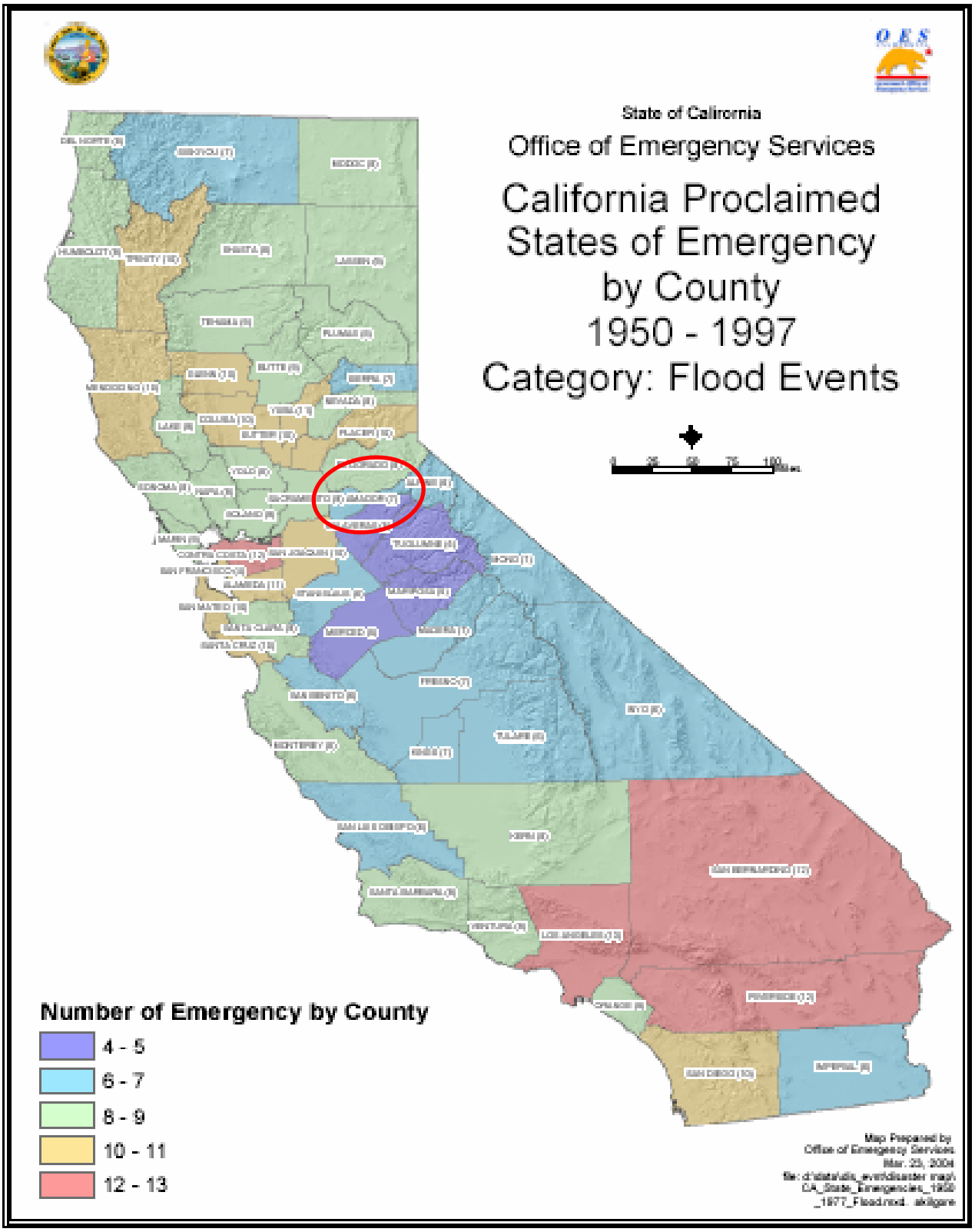
Hazard Mitigation Grant Program. Based on data included in the State Plan, in response to flood disaster #1008, three cities within Amador County, (Ione, Jackson, and Sutter) applied for Hazard Mitigation Grant Funds for flood control projects. These three applicants submitted six claims for a total of $1,563,665 as follows:

- City of Ione – 3 claims
  - $626,229
  - $245,159
  - $192,827
- City of Jackson – 1 claims
  - $188,200
- City of Sutter Creek – 2 claims
  - $311,250
  - $0

Individual Assistance Claims. Individual Assistance (IA) flood damage claims include both residential and small business flood damage sites where either state or federal assistance was requested. The state plan indicates that Amador County has an estimated 328 IA damage location properties (with 25 of these falling within the 100-year floodplain). Over the last 10 years, only 7.62% of all IA flood damage occurred in the 100-year floodplain within Amador County.

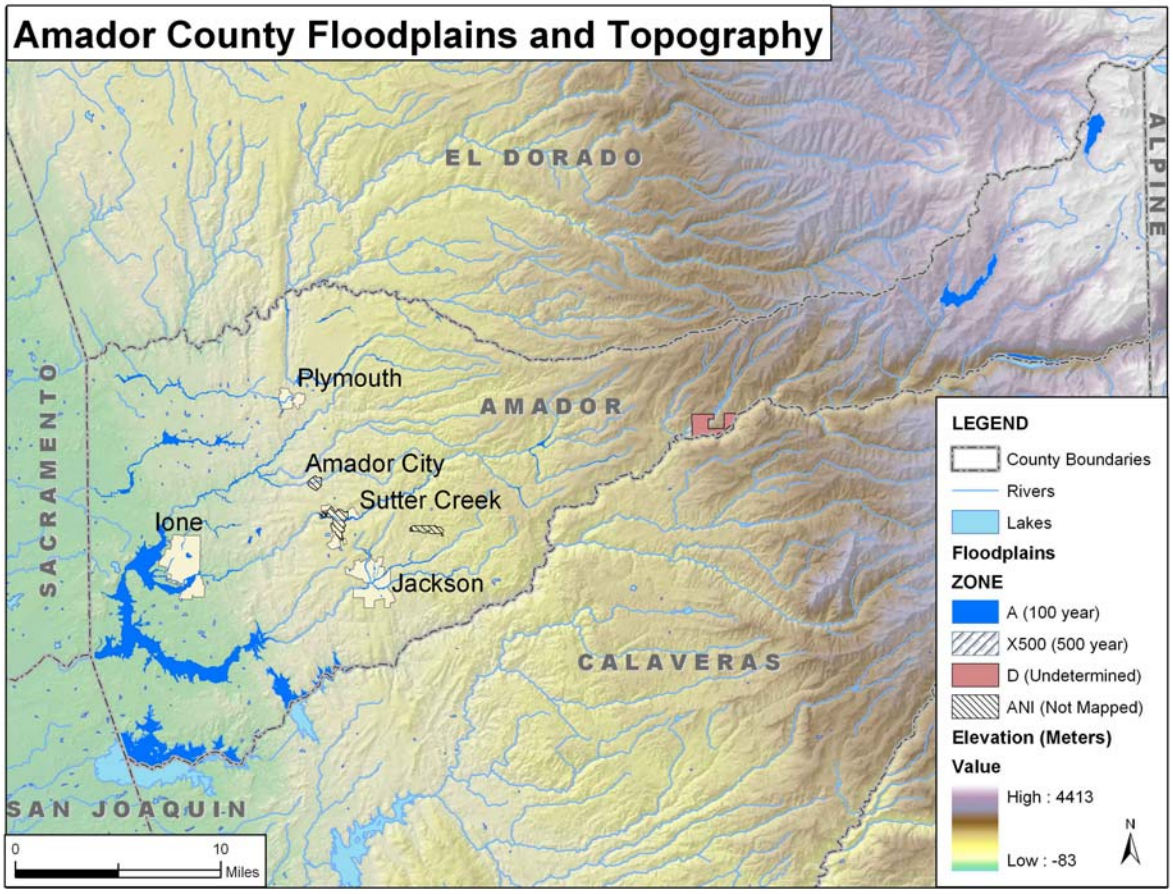
Public Assistance Claims. Under the Public Assistance (PA) Program, FEMA awards grants to state and local governments and certain non-profit agencies for disaster response and recovery activities. The State Plan identifies 276 Amador County PA applicants associated with historic floods, with available PA eligible funds totaling $2,158,970.

Repetitive Loss Properties. Repetitive loss (RL) refers to those properties insured by the NFIP that were damaged more than once from a flood event and for which a claim was filed against the NFIP insurance. The state plan indicates that Amador County has two NFIP repetitive loss properties located within the incorporated portions of the County.



(Source: Draft California Multi-Hazard Mitigation Plan, 2004)

The following figure illustrates the topography of the area and existing 100-year floodplains.



(Map Compilation: AMEC Earth & Environmental; Source data: Amador County, CA-OES and FEMA Q3)

In addition to information previously provided on historical flood events, the following flood event summaries are taken verbatim from information on file with the County Archives.

1849/50 – No specific data available. See references below.

1852 – The great flood of 1852. On March 4 or 5, unceasingly through March 8, torrents fell. By March 10 the Sacramento river was a half foot above its high water mark during the 1850 flood. Raging creeks and rivers roared down their channels and beds to sweep scores of bridges downstream to destruction. The Sacramento Daily Union carried clips from the Chronicle of March 13th which reported: "On the Mokelumne River the loss cannot fall short of $50,000. We hear of Palmer and Co.'s bridge (worth $10,000) at Oregon Bar was carried away. At Middle Bar, the massive bridge of McKinney and Co. (worth $12,000) was swept away with a large ferry boat worth $15,000. All the homes on the north bank of the river at this bar were torn from foundations and carried down the fierce torrent and smashed to pieces against the rocks. All the stores and tents along the south bank to Big Bar were overloaded, leaving them miserable wrecks. At least one minor drowned trying to cross the bridgeless torrent in a canoe. The Chronicle reported the Mokelumne had risen at least 18 feet during the flood, being 4 to 6 feet

higher than the winter of 1849-50. It may have gone even higher. The Middle Bar bridge was 20 feet above normal water level and it still did not survive.

1862 – January 10 thru 12 - Worst storm in memory, almost a biblical deludge. On January 10th the water in the river rose a foot an hour and water poured through every gulch like thunder. The Mokelumne river rose 44 feet above low water or *5* to 18 feet higher than in 1852. The tempest swept the river clean of flumes, dams, bridges, ferries, hovels and homes. Roads were impassable. Travel and communication between the mountains and valley ceased. Provisions could not be restocked. Prices zoomed. For the first time in history all of Stockton was under water and for the second time Sacramento was totally flooded. Big buildings in Jackson were lifted off foundations and floated into the rampaging middle fork; Ione valley was flooded.

1878 – Sudden deludge. That Sunday morning dense banks of clouds were noticed southeast and northwest, gorged with water and collision bent. At 3 pm the towering banks of cloud cleaved, and spawned for an hour and a half, the greatest torrent of rain this area has ever witnessed. While probably raining elsewhere, the rainburst nonetheless seemed confined to Jackson and the watershed of the three forks of Jackson Creek which converge near downtown. Within an hour the north fork topped its banks and swept away or damaged most of the creekside dwellings down to the fork's confluence with the other branches. Chinatown on the west side of Main and hugging the creek was struck worst. Most flimsy and frame Chinese stores floated off foundations and headed downstream, some with occupants inside or clinging to the remains. Despite the catastrophe that hit Chinatown the rest of the town was not apprehensive. It also had no time for fear about a half hour later when a wall of water appeared racing down the middle fork. It arrived later but proved more destructive for these reasons: The middle fork is much longer and has more tributaries and capacity than the north fork and the breaking of the New York Ranch reservoir released its storage into the middle forks surge. That water careened into New York gulch, struck the middle fork near French garden, severely damaging that vegetable basket, and merged madly with the high water coming from upstream. About 4:30 pm into Jackson rushed the wave or wall of water. If it wasn't high enough then to leap the creek's banks, it soon was. All the driftwood, flotsam and debris it carried soon dammed up against the Broadway bridge. Almost instantly the water engulfed the north bank and Water streets, flooding all yards on the south side of the street and wreaking much chaos. There was more long lasting damage, particularly in Jackson Valley, where bodies, buildings, driftwood and all debarked including a plague of rattlesnakes from foothill pits.

1907 – The Great lone Flood: According to the March 22, 1907, *Dispatch*, a storm began that Monday early in the afternoon and beat down in copious sheets until dawn the next day. By 2:30 pm on Monday, Jackson creek was a raging torrent judged to be higher than any time in 25 years. The south fork washed the Zeile mine footbridge off and there wasn't a bridge left spanning the Mokelumne below Middle bar nor was there any bridge left between Lanch Plana and Lodi. The peak of the foothill runoff hit Stockton in the valley later on Tuesday and by midnight Stockton had its greatest flood since 1862.

From various sources, the HMPC also provided information on the following flood events.

January 1980 – Lake Amador, located in the Jackson Valley Irrigation District (JVID), experienced a very large spill event, (i.e., 4-feet over spill). Damaged infrastructure included JVID Sacrificial road and structures. There was additional Levee and Jackson Creek damage to private parties. Request letters are on file asking assistance. Most letters do not specify dollar amount of damage. One estimated repair at $75,000. Assistance to these private parties was denied.

1986 – Heavy rains caused Sutter Creek to swell and exceed its banks causing low-level flooding to adjacent structures located on Main Street (Highway 49), Eureka Street, Badger Street, and Spanish Street. Damage to property occurred; amounts are unknown.

January 1995, DR1044 – Flooding occurred on JVID Jiminez property. Damages included eroded embankment/levee and damage to distribution pipeline. Total damages estimated at $1,999; relief funding estimated at $1,514. Heavy rains also caused Sutter Creek to swell and exceed its banks causing low-level flooding to adjacent structures located on Main Street (Highway 49), Eureka Street, Badger Street, and Spanish Street. Damage to property occurred; amounts are unknown.

March 1995, DR1046 – A rainstorm wreaked havoc from one end of the county to the other as gusty winds wiped out power lines, felled trees and damaged property. Downed power lines left approximately 7,000 households without power. An uprooted cedar tree crashed into the roof of Amador High School and ripped up roof sheeting at Ione Elementary School. Highway 88 flooded with three feet of water at the Carson Spur west of Kirkwood. A tornado was spotted in western Amador County. There were no damages reported. Flooded basements and sewer backups were reported in Sutter Creek. Trees toppled throughout the county including one that crashed into a Pine Grove Home. Water went over the spillway at Pardee Reservoir for the first time since 1986. Damage estimates to roads and public buildings came in at approximately $240,140.00.

January 1997, DR1155 –Amador County was seriously impacted by heavy rain, heavy snow, utility disruption and related storm damage that began on December 20, 1996. The county declared a local emergency on December 23, 1996. The storm caused flooding in the lower elevations and major damage due to 4-5 feet of heavy, wet snow in the higher elevations. Emergency fire and medical services could not be provided to the affected areas due to the magnitude of the storm, along with the hazardous conditions of downed power lines, power poles and trees. Power was out for over one week to many homes in the affected area and only medical evacuations were possible for much of that time. Emergency snow removal equipment and operators were brought in by both Amador County and PG&E in an attempt to restore emergency access for fire, law and medical services as well as for PG&E to restore electrical service. In the City of Ione, Sutter Creek overflowed its banks causing evacuations in flooded areas. In Jackson, Jackson Creek flooded causing water to go over the Pit Street and Broadway Street bridges, propane tanks broke loose and floated down the creek, evacuations of homes and businesses along the creek were ordered. The parking garage in downtown Jackson was under water. In the City of Sutter Creek, the heavy rains caused Sutter Creek to swell and exceed its banks causing low level flooding to adjacent structures located on Main Street (Highway 49),

Eureka Street, Badger Street, and Spanish Street. Mandatory water conservation orders were issued upcountry due to turbidity issues at Tiger Creek Reservoir. In River Pines, the sewer and water treatment plant flooded. Evacuation centers were established throughout the county for county residents that were evacuated from their homes. In addition, evacuation centers were established for residents evacuated from neighboring Sacramento and El Dorado County. Damage estimates for private property exceeded $2 million dollars and damages to roadways and utilities exceeded $5.18 million dollars.

February 1998, DR1203 – (El Nino year) Major flooding occurred below Dam on JVID property and on the JVID creek towards the western end of District. Damage to infrastructure included the following: Oxidation Basin Levee - $7,274; Lake Amador Sacrificial road - $13,551; Jackson Creek Pumping Station Dam - $42,691; and Dry Creek repair - $13,156. Total damages and disaster relief funding to JVID estimated at $76,672. Heavy rains also caused Sutter Creek to swell and exceed its banks causing low-level flooding to adjacent structures located on Main Street (Highway 49), Eureka Street, Badger Street, and Spanish Street. Damage to property occurred; amounts are unknown. Damages were also reported throughout the county, in Amador city, the City of Ione, and to the Amador County Unified School District.

December 2005/January 2006, Winter Storms of 2005/2006, DR1628 – Amador County sustained extensive damages to the public road system due to severe storms, flooding, mudslides and landslides from the period December 17, 2005 to January 3, 2006. Damages were estimated at approximately $1.5 million dollars. There were some minor damages to private property reported. In addition, the Amador Regional Sanitation Authority sustained some damages to their pipeline. The most severe problem associated with this storm was the high winds and downed trees and power lines. A tree fell on a house causing moderate damage and another tree fell on a vehicle causing major damage.

March 2006, Spring Storms of 2006, Presidential Declaration pending – The spring of 2006 was an unusually wet spring. There were constant reports of mudslides throughout the county. On April 8, 2006, the Amador Water Agency sustained major damages to an earthen canal that transports water from Lake Tabeaud to the Tanner Water Treatment Facility in Sutter Creek. A 200 foot section of the canal slid down the hillside cutting off the water supply to the Tanner facility. This outage affected approximately 10,000 raw and treated water customers in Jackson, Sutter Creek, Amador City, Drytown and Ione. Estimates for emergency work and repairs exceed $1.5 million dollars. The county road system sustained major damages and estimates for repairs exceed $1 million dollars. The Amador Region Sanitation Authority, the cities of Plymouth, Ione and Jackson sustained minor damages. There was little damage to private property reported.

Likelihood of Future Occurrences

100-year flood – Occasional: The 100-year flood is the flood that has a one percent chance in any given year of being equaled or exceeded.

<100-year flood/Outside the 100-year floodplain – Likely: Based on historic data, flooding events less than a 100-year flood and those outside of the 100-year floodplain occur frequently during periods of heavy rains.

Based on historical data, the portion of Amador County located within the Dry Creek watershed is more likely to experience flooding than the portions of the County located within the other three watersheds. With the exception of Amador City and Plymouth, portions of all other incorporated cities in Amador County are at least partially located within the 100-year floodplain. However, flooding events have historically occurred, both within the 100-year floodplain and in other localized areas. Annual flooding occurrences in defined areas confirm that under existing conditions, flooding will continue to occur. Given the flood data available for the County, it is evident that living outside of a designated 100-year floodplain does not guarantee protection from flood damage in Amador County.

WILDFIRE

Wildfire and Urban Wildfire are an ongoing concern for Amador County. Generally, the fire season extends from early spring to late fall. Fire conditions arise from a combination of hot weather, an accumulation of vegetation, and low moisture content in air and fuel. These conditions, when combined with high winds and years of drought, increase the potential for wildfire to occur. While the wildfire risk is predominantly associated with Wildland-Urban Interface (WUI) areas, significant wildfires can also occur in heavily populated areas. WUI is a general term that applies to development interspersed or adjacent to landscapes that support wildland fire. WUI areas have been a major focus of California Department of Forestry and Fire Protection's (CDF) fire management strategy since at least 1972. A fire along this wildland/urban interface can result in major losses of property and structures.

Potential losses from wildfire include: human life, structures and other improvements; natural and cultural resources; the quality and quantity of the water supply; other assets such as timber, range and crop land, and recreational opportunities; and economic losses. Smoke and air pollution from wildfires can be a severe health hazard. In addition, catastrophic wildfire can lead to secondary impacts or losses such as future flooding, landslides, and erosion during the rainy season. Generally, there are three major factors that sustain wildfires and predict a given area's potential to burn. These factors are 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 man-made structures, such as homes, and other 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, one that burns in the upper canopy and cannot be controlled. The volume of available fuel is described in terms of Fuel Loading. Certain areas in and surrounding Amador County are extremely vulnerable to fires as a result of overgrown fuels combined with a growing number of structures being built near and within rural lands. Fuel is the only factor that is under human control.

- **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 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 a wind, the faster a fire will spread, and the more intense it will be. Winds can be

significant at times in Amador County. The western portion of the county often experiences surface winds blowing from the north and west. The dryer north winds combined with light flashy fuels create conditions for large grass fires, which while menacing generally do little long-term damage. The resulting west winds are brisk and push fires in a west to east direction. The major canyons in Amador County are also orientated west to east, which tends to channel wind into canyons in a way that increases its upslope velocity.

In addition to wind speed and direction, 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, often in difficult-to reach terrain for firefighters. Related to weather is the issue of recent drought conditions contributing to concerns about wildfire vulnerability. During periods of drought, the threat of wildfire increases.

Factors contributing to the wildfire risk in Amador County include:

- Overstocked forests, severely overgrown vegetation, and lack of defensible space around structures;
- Large percentage of high hazard fuels;
- Conditions such as drought and overstocked forests contribute to increased beetle kill in weakened and stressed trees. In Amador County beetle kill is most established in the true firs within the upper elevations of the Eldorado National Forest (i.e., in the 5,000 to 7,000 elevation range). While the infestation is not exceptionally heavy, the mortality is noticeable along the Highway 88 corridor and is more prevalent in the heavily stocked stands of the Foster Meadow to Mormon Emigrant Trail area;
- The County contains steep rugged river canyons that limit accessibility except on foot;
- Increasing population density and increasing development within the WUI areas; and
- The area east of Highway 49 which contains the largest population also contains the most hazardous fuels and most difficult terrain.

All of the above factors indicate a potential for very active and severe fire behavior.

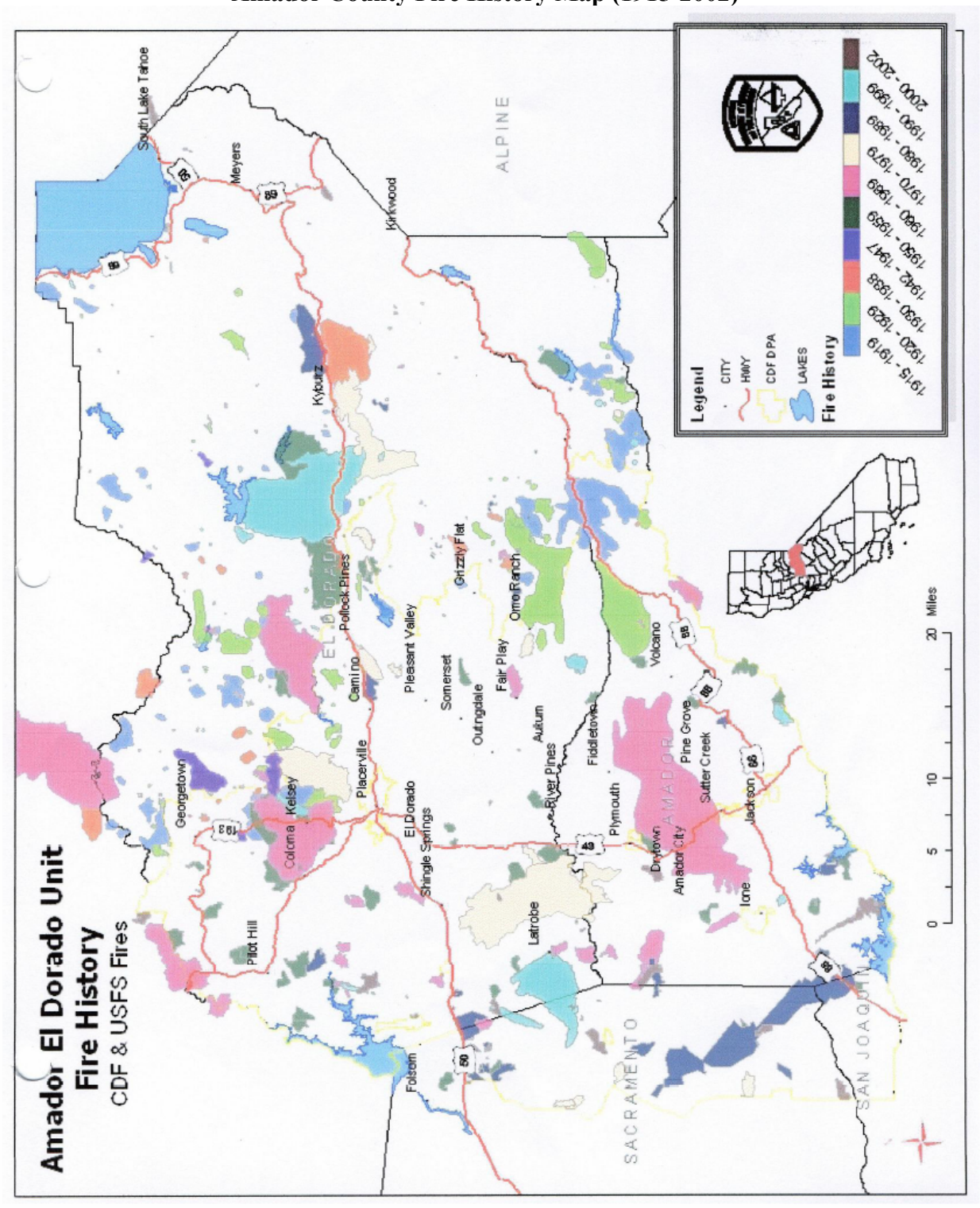
Past Occurrences

Wildfires are of significant concern throughout California. According to the CDF, vegetation fires occur within CDF's jurisdiction on a regular basis; most are controlled and contained early with limited damages. For those ignitions that are not readily contained and become wildfires, damages can be extensive. There are many causes of wildfire from naturally caused lightning fires to human-caused fires linked to activities such as smoking, campfires, equipment use and arson. According to CDF, from 1994 to 1999, over 90 percent of fires in California were attributed to human causes. Further, recent studies conclude that the greater the population density in an area, the greater the chance of an ignition. With population continuing to grow throughout California and Amador County, the risk from wildfires also continues to grow. (http://www.frap.cdf.ca.gov/projects/ignition_regression/ ignit_pop.html.)

From March through November, Amador County is susceptible to wildland fires. The valley consists of major grazing land as well as Scrub Oak, Scotch Broom, and other types of brush. The foothill and mountain areas have large concentrations of Toyon and Manzanita and are heavily forested. This vegetation combined with hot, dry weather creates prime wildfire conditions. Amador County's fire history is one of numerous small fires with large fires occurring every thirty to forty years. The last large fire was the Rancheria Creek Fire in 1961. Most large fires in the County align east to west due to prevailing winds and terrain.

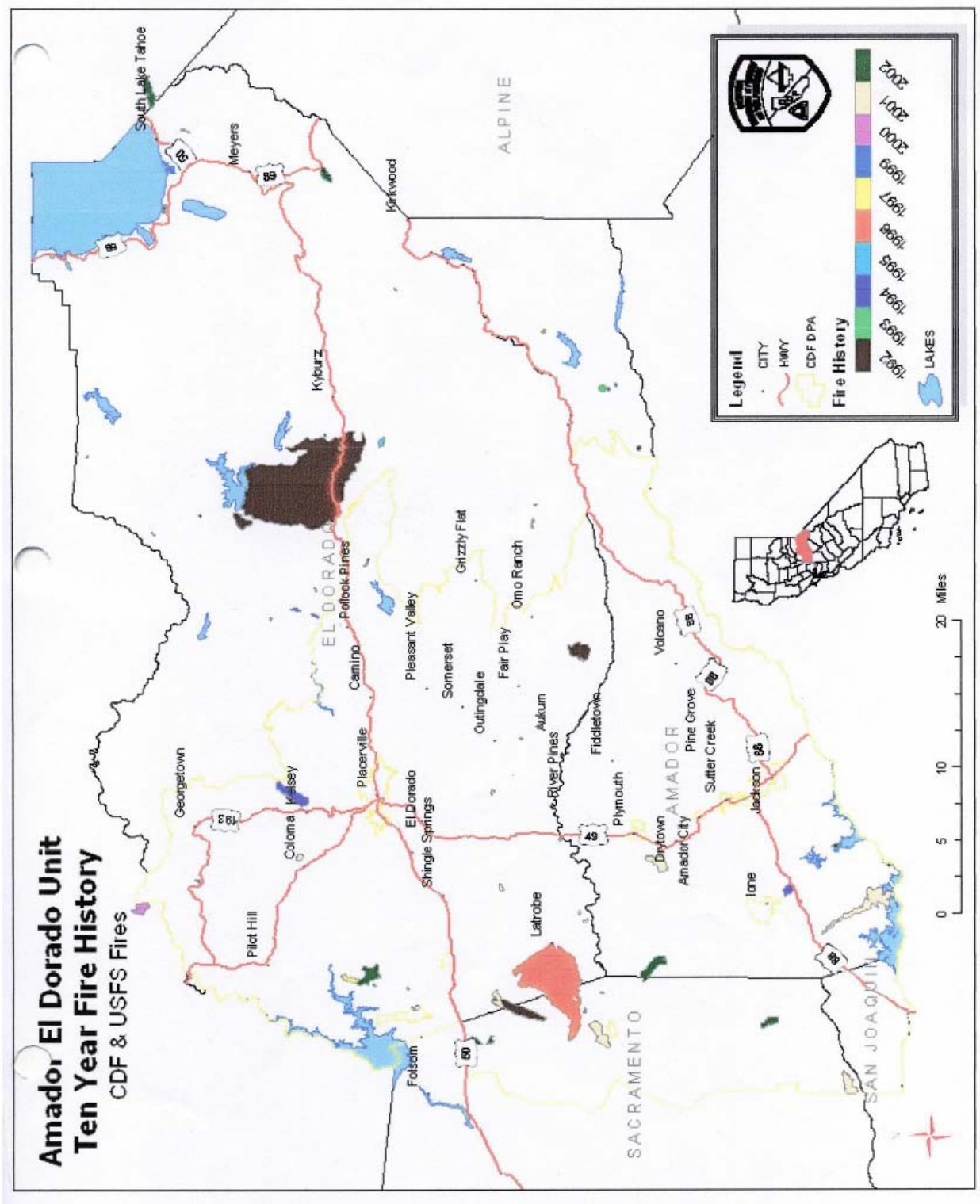
A map of the fire history and the most recent ten-year fire occurrence map (1992-2002) of Amador County are provided on the following pages.

Amador County Fire History Map (1915-2002)



(Source: Amador Fire Plan, 2004)

Amador County 10-year Fire Occurrence Map (1992-2002)



(Source: Amador Fire Plan, 2004)

It is important to note that in addition to the Amador County fire history detailed above, there are numerous smaller fires that occur in the area year after year. These smaller fires have the ability to quickly get out of hand and become significant fires. Also, depending on the area, small fires in acreage can result in large losses.

The HMPC provided the following details on fire history in Amador County.

1855 – City of Jackson: Although not considered a wildland fire, a fire destroyed a portion of the town.

1862 – City of Jackson: A fire (i.e., also not a wildland fire) destroyed most of Jackson, which was later rebuilt.

August 5, 1926 – A fire which started between Ione and Buena Vista burned an area of between 30–40,000 acres. The fire was stopped short of entering the City of Jackson.

1961 – Rancheria Creek Fire: This was the worst fire in the County in over 50 years. In September of 1961, a fire started a mile and half west of Sutter Creek. Twenty-five minutes later, a second fire broke out on Dry Creek north of the Old Rancheria store. Whipped by a fierce wind, the latter fire moved past Plymouth, swept through the New Chicago and Fremont Mine country, moved to Bunker Hill, and by dusk, Amador City was surrounded by flames. The fire left one house remaining in historic "Stringbean Alley" and in Sutter Creek destroyed the Amador High School gym. Overall, the fire burned over 30,000 acres, destroyed over 30 buildings, and did about $1,243,400 worth of damage. (See photos at the end of this section.)

1964 – City of Sutter Creek: Wildland fire with structures involved occurred during the summer in the northwestern area of Sutter Creek from the City limits up to Amador High School area.

Summer 2003 – A forest fire near Panther Creek burned 250 acres of land.

July 2003 – A wildfire between Ione and Martell closed a section of Highway 88 for about five hours. The fire began as five smaller roadside fires that merged into three larger fires. Approximately 45 acres were scorched in the blaze.

October 2004 – The Power Fire: The Power Fire burned a total of just under 17,000 acres near the Salt Springs and Bear River reservoir areas. 13,611 acres were on USFS land within the Amador District of the Eldorado National Forest and about 3,000 acres were on private land. The exact cause is unknown; although it is confirmed to be human-caused. Wind gusts of up to 50 mph caused the fire to escape original containment. No structures were lost and no injuries or fatalities were reported. Firefighting costs were estimated at $6.8 million. Known damages include over $80,000 to repair fences and $33,707,115 in potential damages to crops, if not harvested. Other impacts included loss of grazing, hunting and fishing lands.

Other summary data provided by the HMPC indicated that between 1917 and 2004, there were 53 fires greater than 100 acres in size within the County. Although historically there have been

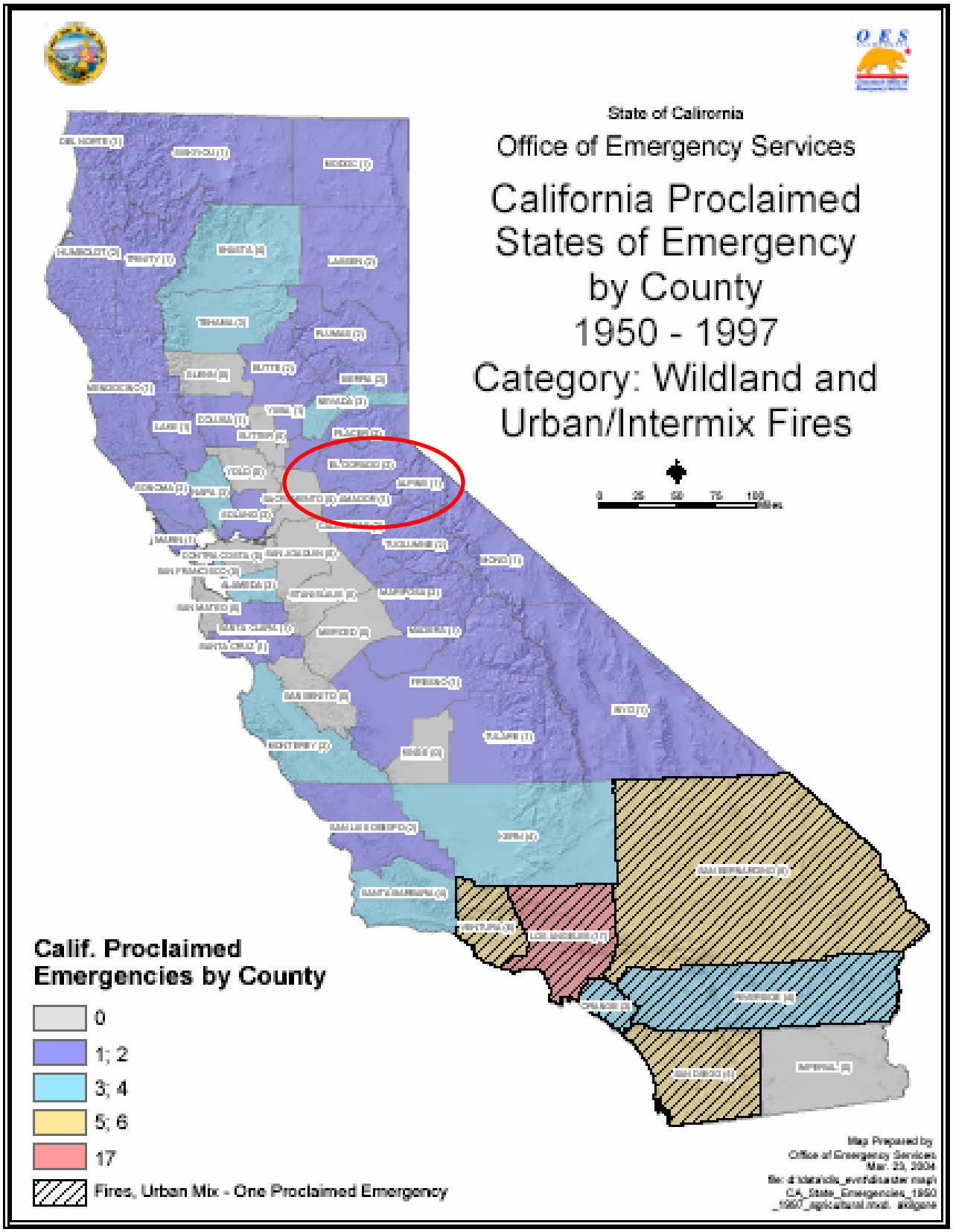
numerous wildfires in Amador County, there has only been one proclaimed state of emergency for wildfires between 1950 and 1997 for the 1961 Rancheria fire. This is illustrated in the map from the Draft California Multi-Hazard Mitigation Plan that follows the photos of the 1961 Fire.

1961 Rancheria Creek Fire

(Source: Amador County Archives)

1961 Rancheria Creek Fire

(Source: Amador County Archives)


State of California
Office of Emergency Services
California Proclaimed States of Emergency by County
1950 - 1997
Category: Wildland and Urban/Intermix Fires
Calif. Proclaimed Emergencies by County
0
1; 2
3; 4
5; 6
17
Fires, Urban Mix - One Proclaimed Emergency
Map Prepared by
Office of Emergency Services

Likelihood of Future Occurrences

Likely: Based on historic data, Amador County has experienced 53 fires greater than 100 acres in size between 1917 and 2004. This is an average of one fire every 1.64 years, or a 61% chance of a fire any given year. However, it should be noted that only three of the 53 fires were in excess of 10,000 acres. These include the 1961 Rancheria Fire (34,104 acres), the 1976 Quarry Fire (20,869 acres) and the 2004 Power Fire (16,982 acres).

From May to October of each year, Amador County faces a serious wildland fire threat. Most of the County is susceptible to wildland fires. The threat of wildfire and potential losses are constantly increasing as human development and population increases and the Wildland Urban Interface areas expand. Due to its high fuel load and long, dry summers, most of Amador County continues to be at risk from wildfire.

EARTHQUAKE

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 causes 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. Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface. Seismic shaking is typically the greatest cause of losses to structures during earthquakes. Seismologists have developed two scales (as seen on the following page) to quantify the shaking intensity of an earthquake's effects, which is measured by how an earthquake is felt by humans.

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 lines. Other damage-causing effects of earthquakes include surface rupture, fissuring, settlement, and permanent horizontal and vertical shifting of the ground. Secondary impacts can include landslides, seiches, liquefaction, and dam failure.

In populated areas, the greatest potential for loss of life and property damage can come as a result of ground shaking from a nearby earthquake. The degree of damage depends on many interrelated factors. Among these are the Richter 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 ground water, topography, and finally, the design, type, and quality of building construction.

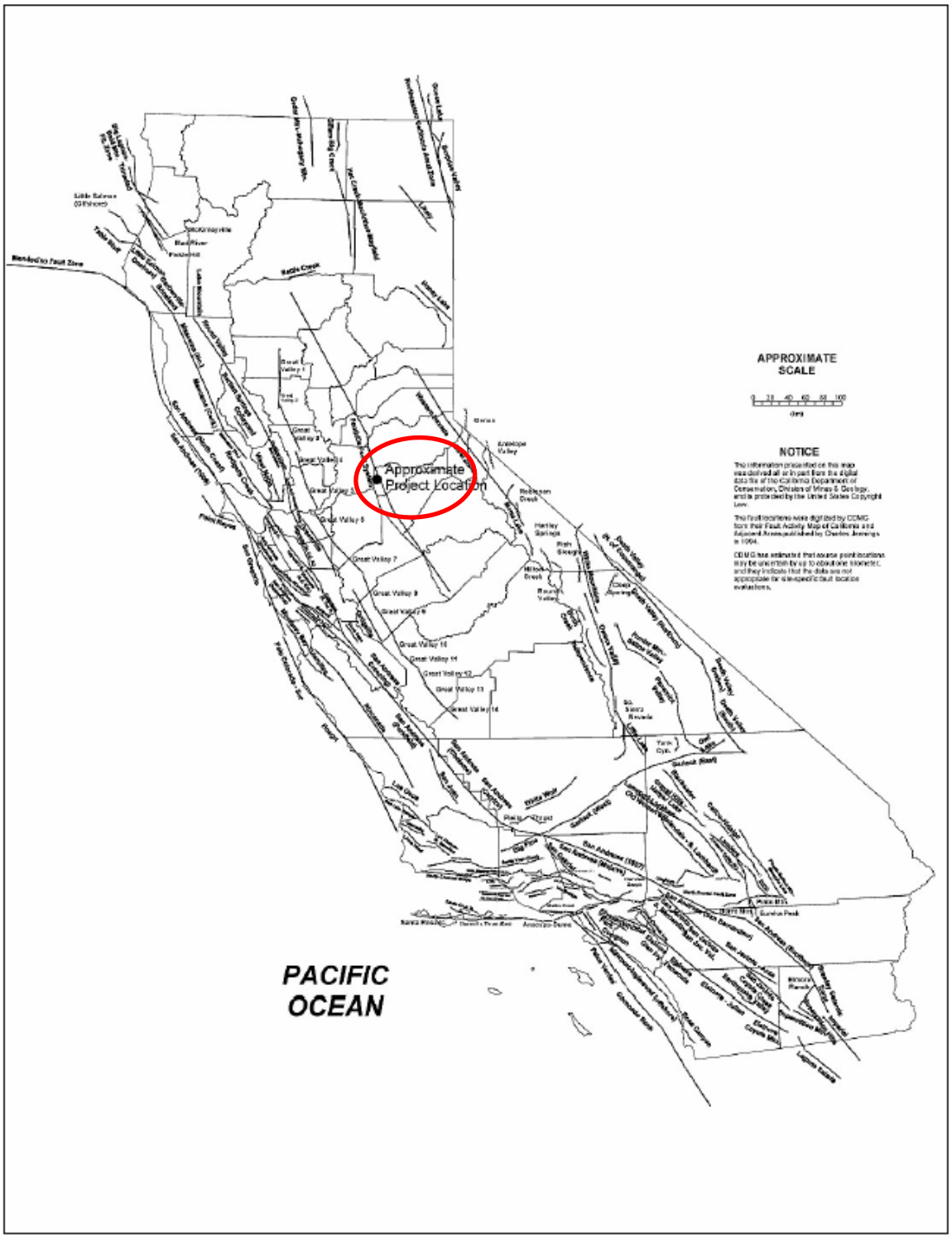
	EARTHQUAKE INTENSITIES WITH APPROXIMATE CORRESPONDING MAGNITUDES	
MERCALLI INTENSITY	**DESCRIPTION**	**RICHTER MAGNITUDE**
I	*INSTRUMENTAL*: detected only by seismographs	3.5
II	*FEEBLE*: noticed only by sensitive people	4.2
III	*SLIGHT*: like the vibrations due to a passing train; felt by people at rest, especially on upper floors	4.3
IV	*MODERATE*: felt by people while walking; rocking of loose objects, including standing houses	4.8
V	*RATHER STRONG*: felt generally; most sleepers are awakened and bells ring	4.9 - 5.4
VI	*STRONG*: trees sway and all suspended objects swing; damage by overturning and falling of loose objects	5.5 - 6.0
VII	*VERY STRONG*: general alarm; walls crack; plaster falls	6.1
VIII	*DESTRUCTIVE*: car drivers seriously disturbed; masonry fissured; chimneys fall; poorly constructed buildings damaged	6.2
IX	*RUINOUS*: some houses collapse where ground begins to crack, and pipes break open	6.9
X	*DISASTROUS*: ground cracks badly; many buildings destroyed and railway lines bent; landslides on steep slopes	7.0 - 7.3
XI	*VERY DISASTROUS*: few buildings remain standing; bridges destroyed; all services (railways, pipes and cables) out of action; great landslides and floods	7.4 - 8.1
XII	*CATASTROPHIC*: total destruction; objects thrown into air; ground rises and falls in waves	> 8.1

(Source: Math/Science Nucleus.Org website)

Amador County lies between two seismically active regions in the western United States. Tectonic stresses associated with the North American–Pacific Plate boundary can generate damaging earthquakes along faults to the west of the County. Eastern Amador County borders the Basin and Range province that entails most of Nevada and western Utah. This area is riddled with active faults that are responsible for and form the boundary between each basin or valley and the neighboring mountain range. "Active" faults, which represent the highest earthquake hazard, are those that have ruptured to the ground surface during the Holocene period (about the last 11,000 years).

Past Occurrences

Amador County is located in a relatively aseismic area with respect to other more seismically active areas in California. Amador County itself is traversed by the Foothills fault system, a complex series of northwest trending-faults that are related to the Sierra Nevada uplift, and whose activity is little understood, running from about Oroville in the north to east of Fresno in the south. This system contains the closest and most potentially significant faults in the area, and includes the potentially active or active Bear Mountains fault, Melones fault, and Cleveland Hills fault, among others. Much of the following information and maps are taken from the Environmental Impact Report for the Buena Vista Landfill located in the County just south of Ione. A California fault map and a map of the Foothills fault system are provided on the following pages.



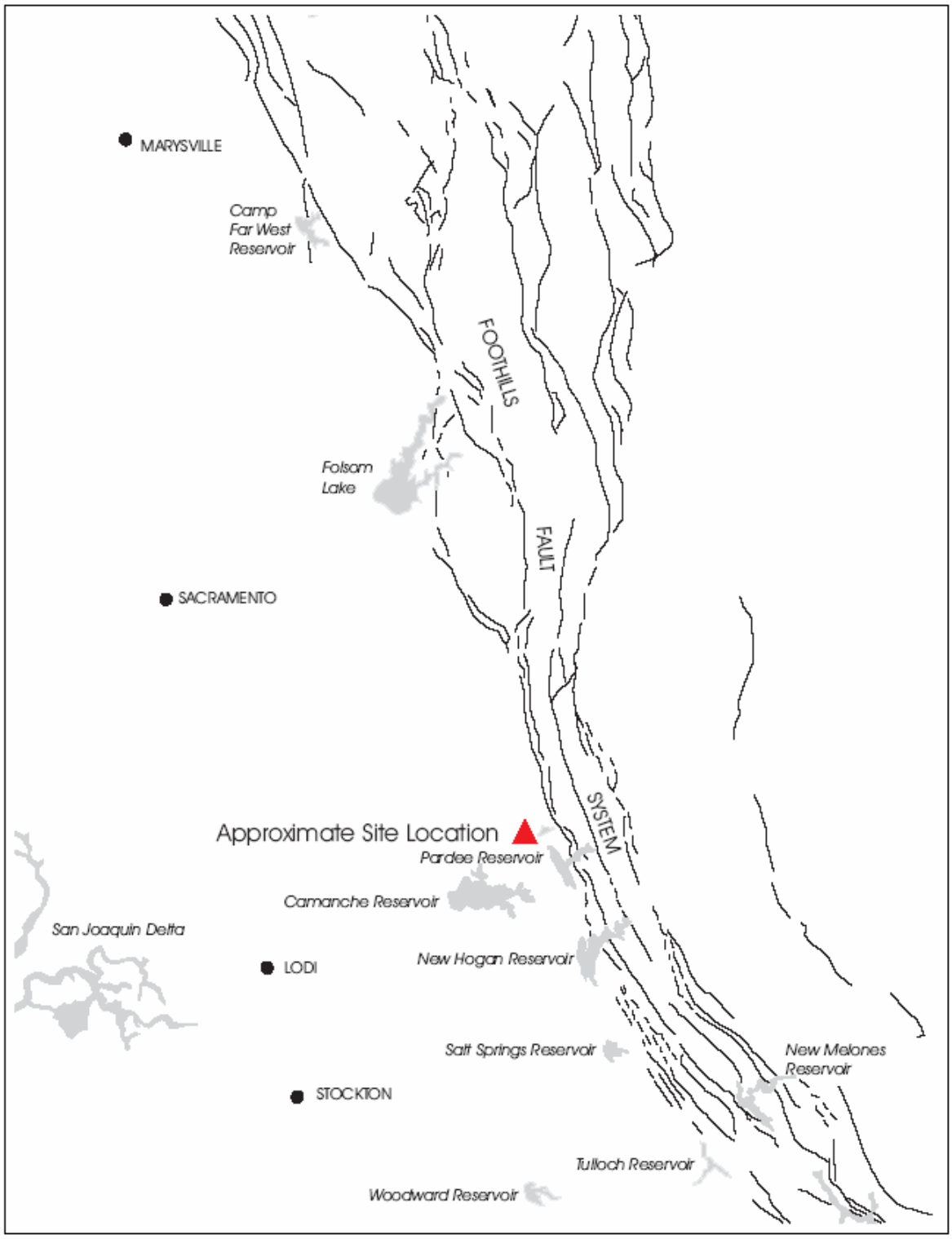
California Fault Map (CDMG)

EXHIBIT 4.2-4

Buena Vista Landfill
G 2T068.01 4/03

NORTH

EDAW



Foothill Faultlines

EXHIBIT 4.2-5

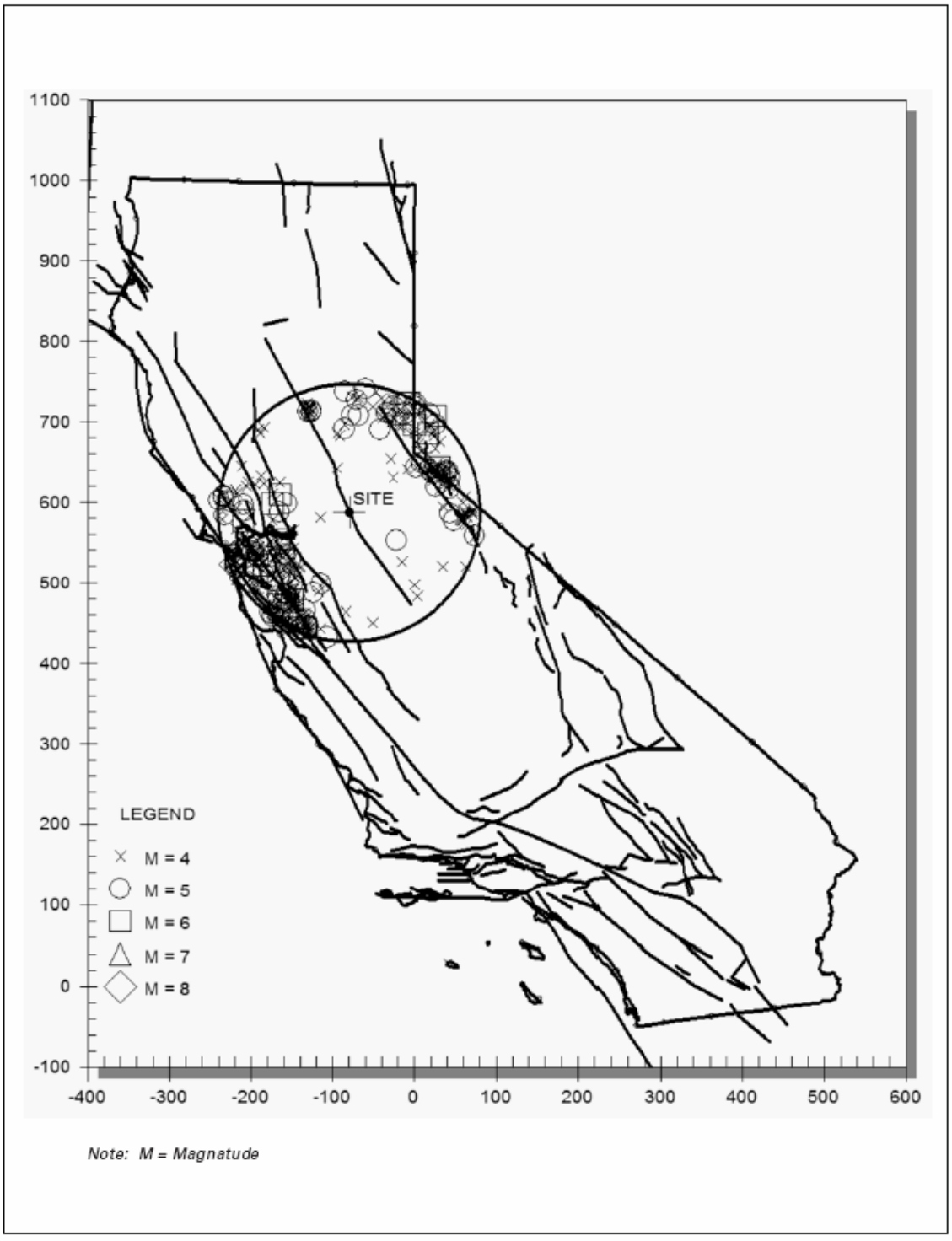
Buena Vista Landfill
G 2T068.01 4/03

NORTH

EDAW

According to the Buena Vista EIR, although portions of the Foothill fault system are considered active or potentially active, the California Division of Mines and Geology Open File Report 84-52 (1994) reports that special seismic zoning is not recommended for the fault system as the individual faults of the system are either poorly defined at the surface or lack evidence of Holocene (recent) faulting. The closest known source of large earthquakes is the Sierra Frontal Fault System along the eastern margin of the Sierra Nevada, which includes the Carson Valley Fault. This fault is located within a few miles of the eastern border to the County and has been evaluated as being able to generate earthquakes that produce levels of damage up to VII on the Mercalli Scale.

Although the County has felt ground shaking from earthquakes with epicenters located elsewhere, no major earthquakes have been recorded within the County. The map on the following page shows historic earthquakes that have occurred in the area (specifically within 100 miles of the Amador County Buena Vista Landfill). Details on historic earthquake events follow.



Historic Earthquakes within 100 Miles of Buena Vista Landfill

EXHIBIT 4.2-3

Buena Vista Landfill
G 2T068.01 6/03

NORTH

EDAW

Notable regional earthquake events include those detailed below. It is unknown whether damages occurred within Amador County and to what extent these events were actually felt by County residents.

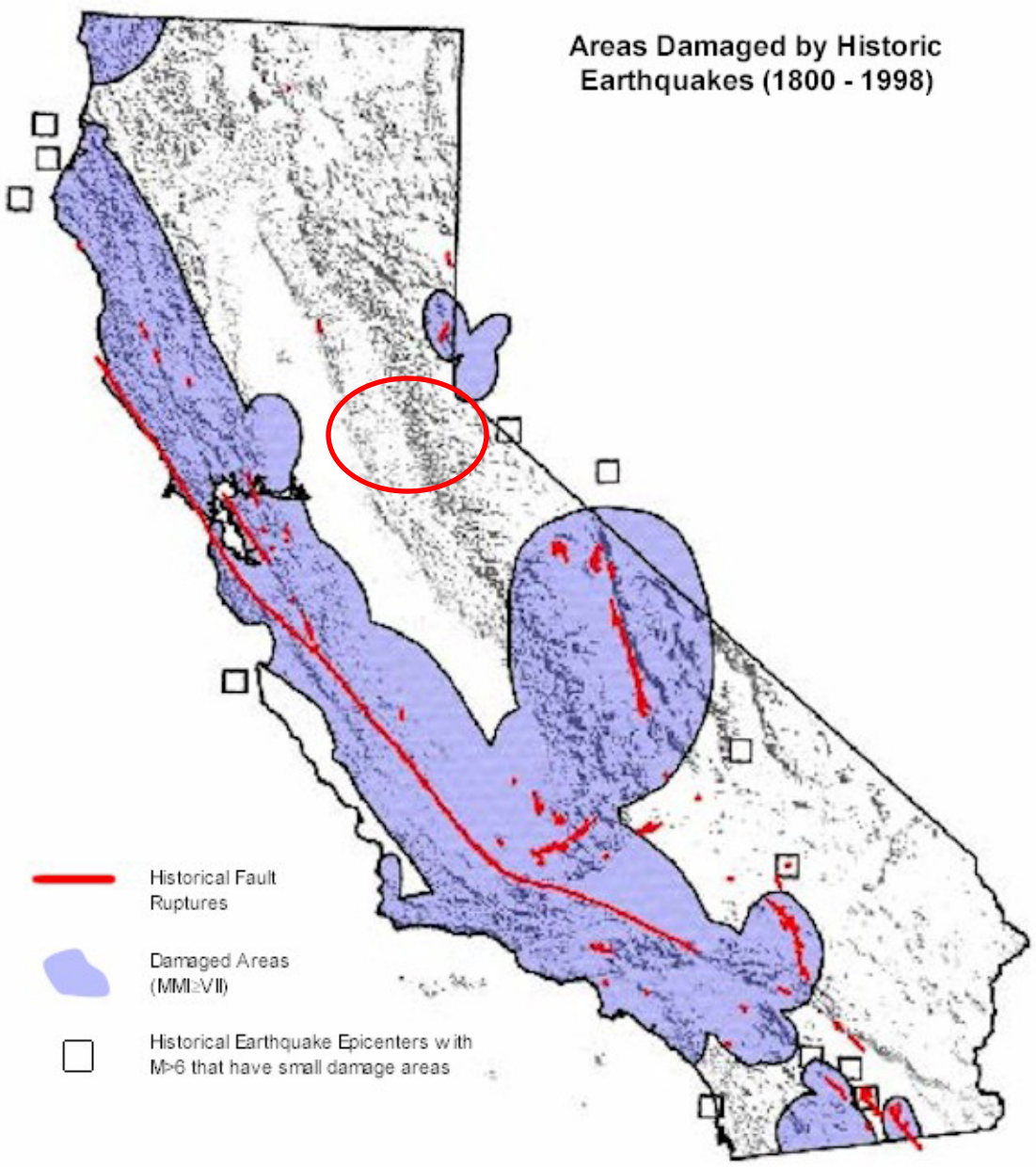
- A potential earthquake source is the Midland Fault Zone on the western side of Sacramento Valley, where in 1892 an earthquake centered between the cities of Vacaville and Winters caused minor damage in surrounding areas.

- An estimated 4.0+ Richter magnitude earthquake occurred between Auburn and Folsom in nearby Placer County in 1908 with an epicenter possibly associated with the Bear Mountain fault.

- To the east in Nevada, there are several faults associated with a series of earthquakes in 1954, especially the major (7.1 Richter magnitude) December 16, 1954 Fairview Peak event (about 100 miles east of Carson City). These events caused no damage in Reno, but there was some damage in Sacramento, probably because of the soft soil conditions.

- A recently active fault in the western Sierra Nevada foothills is the Cleveland Hills fault. This fault was the source of the 1975 Oroville earthquake (Richter Magnitude: 5.7), which was felt strongly in neighboring areas.

The map on the following page obtained from the California Geological Survey's website provides additional historical earthquake information for California and the Amador County area. This map illustrates areas damaged by historic earthquakes.



(Source: http://www.consrv.ca.gov/CGS/rghm/psha/ofr9608/index.htm#Faults%20in%20California)

The map on the following page illustrates earthquake proclamations by County between 1950 and 2003. During that period, there were no earthquake proclamations for Amador County.

(Source: State of California Draft Multi-Hazard Mitigation Plan)

Likelihood of Future Earthquake Occurrences

Unlikely: Based on historical data and the location of Amador County relative to potentially active faults. No major earthquakes have been recorded within the County; although the County has felt ground shaking from earthquakes with epicenters located elsewhere.

Looking at historical data, Amador County is located within a region with faults that are capable of producing maximum credible earthquakes of up to 6.5 magnitude and peak ground acceleration at the site between 0.1g to 0.2g. Further, in evaluating available Seismic Shaking Hazards Map, these accelerations have a 10% chance of being exceeded in 50 years. Taken from the Amador County, Buena Vista Landfill Draft EIR, the table that follows provides a summary of faults within 100 miles of the landfill site, south of Ione. The estimated maximum credible earthquake (MCE), maximum probable earthquake (MPE), and the peak horizontal ground acceleration (PHGA) associated with each MPE and MCE are also summarized in the table. The PHGA estimates included in the table were based on the Abrahamson and Silva (1997) ground motion attenuation model for a rock site.

Table 4.2-1
SUMMARY OF FAULTS WITHIN 100 MILES OF SITE
Buena Vista Landfill
Amador County, California

FAULT	DISTANCE TO SITE		MAXIMUM CREDIBLE EARTHQUAKE		MAXIMUM PROBABLE EARTHQUAKE	
	Miles	Kilometers	Moment Magnitude (M_w)	PHGA (g)	Moment Magnitude (M_w)	PHGA (g)
FOOTHILLS FAULT SYSTEM	6.0	9.7	6.5	0.434	5.2	0.190
GREAT VALLEY 5	48.2	77.6	6.5	0.049	5.5	0.021
GREAT VALLEY 6	50.0	80.4	6.7	0.053	5.7	0.026
GREAT VALLEY 7	52.0	83.7	6.7	0.050	5.7	0.025
GREAT VALLEY 4	53.4	85.9	6.6	0.046	5.7	0.024
GREENVILLE	58.3	93.9	6.9	0.039	5.9	0.015
GREAT VALLEY 8	62.2	100.1	6.6	0.039	5.7	0.020
MOHWAK - HONEY LAKE ZONE	64.2	103.4	7.3	0.045	6.5	0.027
GREAT VALLEY 3	64.4	103.6	6.8	0.043	5.9	0.013
CONCORD - GREEN VALLEY	64.6	104.0	6.9	0.035	5.7	0.019
GENOA	64.8	104.3	6.9	0.045	5.6	0.016
CALAVERAS (No.of Calaveras Res)	68.4	110.0	6.8	0.031	6.5	0.025
HUNTING CREEK - BERRYESSA	70.4	113.3	6.9	0.032	6.4	0.023
WEST NAPA	72.9	117.4	6.5	0.023	5.4	0.006
ORTIGALITA	74.1	119.3	6.9	0.030	5.6	0.008
HAYWARD (Total Length)	76.7	123.4	7.1	0.033	6.7	0.026
HAYWARD (South)	76.7	123.4	6.9	0.029	6.5	0.022
CALAVERAS (So.of Calaveras Res)	77.0	124.0	6.2	0.016	6.2	0.016
HAYWARD (North)	77.2	124.2	6.9	0.029	6.5	0.022
ANTELOPE VALLEY	78.0	125.6	6.7	0.032	5.4	0.010
RODGERS CREEK	78.9	126.9	7.0	0.030	6.5	0.022
HAYWARD (SE Extension)	79.0	127.2	6.4	0.020	5.9	0.010
GREAT VALLEY 9	83.6	134.6	6.6	0.028	5.6	0.012
ROBINSON CREEK	86.8	139.7	6.4	0.023	5.0	0.005
MONTE VISTA - SHANNON	91.1	146.6	6.8	0.029	5.1	0.005
GREAT VALLEY 2	92.2	148.4	6.4	0.022	4.2	0.002
MONO LAKE	94.1	151.4	6.6	0.025	5.9	0.014
SAN ANDREAS (1906)	95.4	153.5	7.9	0.047	7.4	0.033
SAN ANDREAS (Peninsula)	95.4	153.5	7.1	0.027	7.0	0.025
BARTLETT SPRINGS	96.4	155.2	7.1	0.026	6.6	0.018
SARGENT	96.9	156.0	6.8	0.021	6.1	0.011
SAN ANDREAS (North Coast)	97.4	156.8	7.6	0.037	7.4	0.032
SAN ANDREAS (Santa Cruz Mtn.)	98.2	158.1	7.0	0.024	6.7	0.019
MAACAMA (South)	98.3	158.2	6.9	0.022	6.4	0.016
QUIEN SABE	98.8	159.0	6.4	0.016	5.3	0.003
SAN GREGORIO	99.6	160.3	7.3	0.029	6.5	0.017

NOTES:
1. PHGA - Peak Horizontal Ground Acceleration
2. PHGA calculated using Abrahamson and Silva (1997) attenuation relationship
3. Fault locations (except Foothills fault system) from California Division of Mines and Geology (1995) digitized fault database
4. Foothills fault system from Jennings (1994)

Additionally, western Amador County may experience ground shaking from distant major to great earthquakes on faults to the west and east. For example, to the west, both the San Andreas fault (source of the 8.0 estimated Richter magnitude San Francisco earthquake that caused damage in Sacramento in 1906, including the State Capitol, the full extent of which was not discovered until the mid-1970s) and the closer Hayward fault have the potential for experiencing major to great events (i.e., >6.7). The US Geological Survey recently (February 2004) estimated that there is a 62 percent probability of at least one 6.7 or greater magnitude earthquake occurring that could cause widespread damage in the greater San Francisco Bay area before 2032.

Another potential source for earthquakes in Amador County are the faults associated with the western edge of the Central Valley, recently defined as the Coast Range Central Valley (CRCV)

boundary thrust fault system. Various documents define portions of this little known system as the Midland Fault Zone or the Dunnigan Hills fault where, as noted above, the 1892 Vacaville-Winters earthquake occurred. A southern part of the CRCV system may have been the source of the very damaging 1983 Coalinga earthquake.

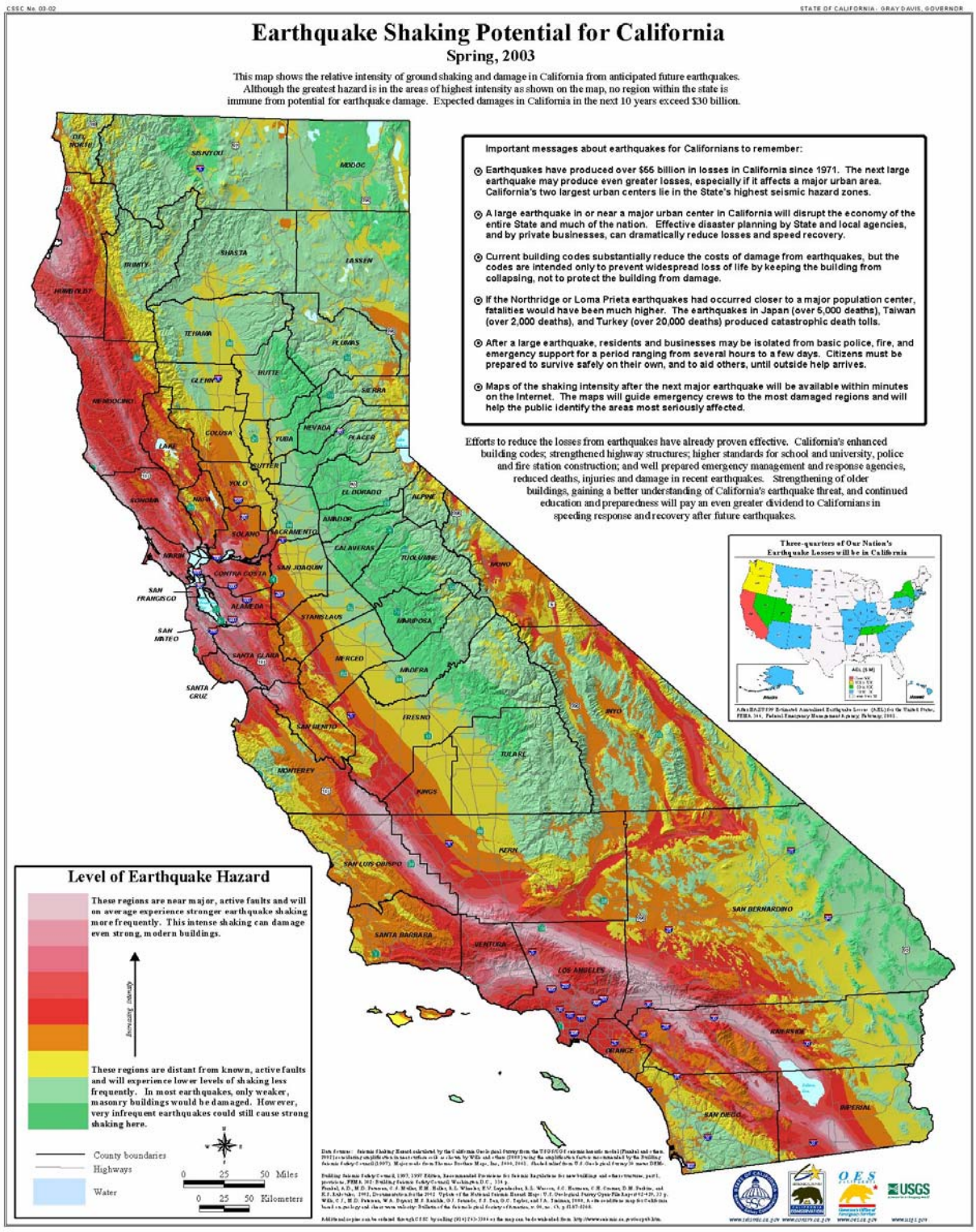
The results of recently announced (2000) earthquake scenarios based on research associated with historic fault movement and recent (2004) volcanic activity in the greater Lake Tahoe area provides improved knowledge of the mountain-building processes involved and the potential effects of events generated by earthquakes centered beneath or in the vicinity of the lake. However, this information does not necessarily indicate that the area's earthquake hazard is greater than previously understood.

It is known that large (estimated magnitude 7+) earthquakes have occurred historically beneath Lake Tahoe, which is part of the Basin and Range Extensional Province and is characterized by normal faulting on the north and to the west. University of Nevada and Japanese researchers confirmed the existence of the potential hazard affecting lakeside communities in California and Nevada. Using three scenarios, the researchers found that run-up from seiche waves (tsunami-like waves occurring in enclosed bodies of water) caused by earthquakes would be capable of damaging buildings and utilities, particularly if they are accompanied by the subsidence of shoreline areas also due to the shaking.

Volcanic magma (molten rock) migrating about 20 miles below the surface of the Sierra Nevada mountains caused a swarm of about 1,600 small earthquakes in late 2003 and early 2004. The 20 mile depth is about twice as deep as earthquakes caused by normal faulting in the region measured during the last 30 years. Yet, these events are reminders that the Sierra Nevada range is relatively young and is moving to the northwest at a rate of about 12 to 14 millimeters a year.

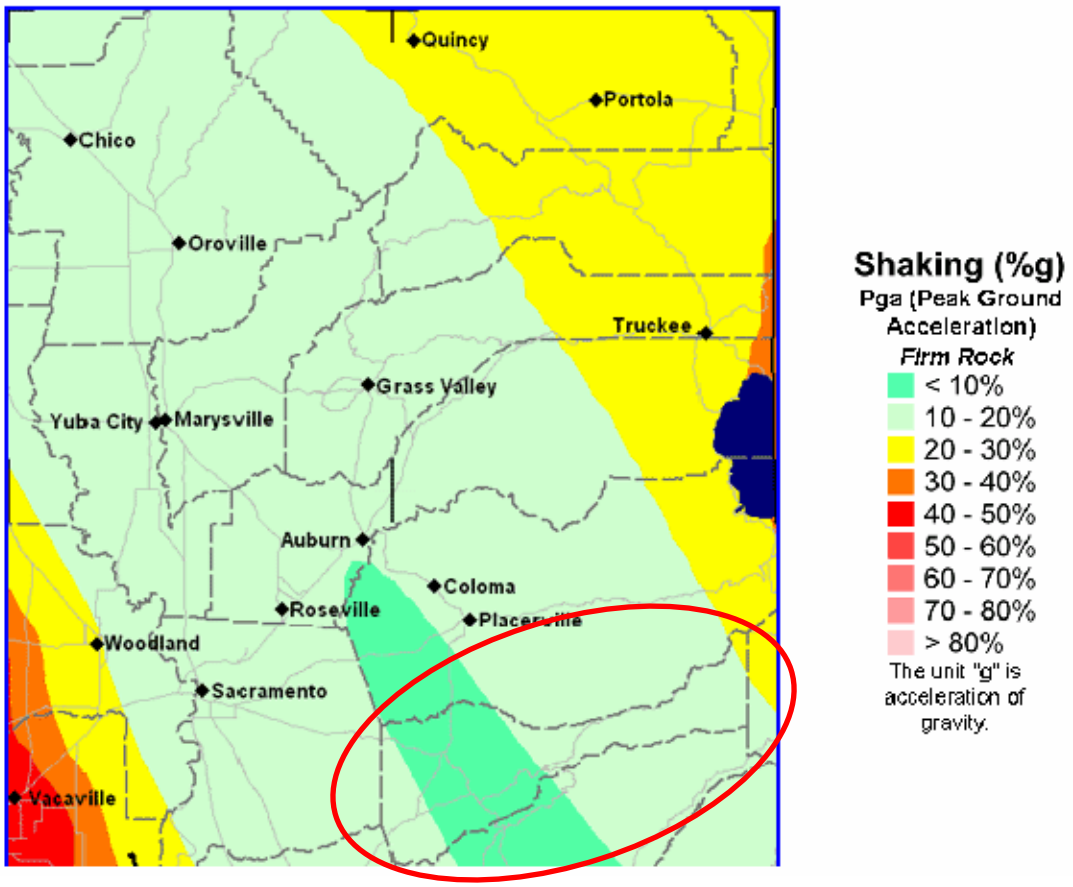
Seismic hazard zone maps and earthquake fault zone maps are used to identify where such hazards are more likely to occur based on analyses of faults, soils, topography, groundwater, and the potential for earthquake shaking sufficiently strong to trigger landslide and liquefaction.

The map from the Draft California Multi-Hazard Mitigation Plan on the following page shows the various levels of earthquake hazards in California. Shake maps, which show the distribution of earthquake shaking, help identify potential vulnerabilities to earthquake hazards. The California Geological Survey's Probabilistic Seismic Hazard Map (on the following page) of California depicts the shaking level that has a 10 percent chance of being exceeded over a period of 50 years (an annual probability of 1 in 475 of being exceed each year).


CSSC No. 03-02
STATE OF CALIFORNIA - GRAY DAVIS, GOVERNOR
Earthquake Shaking Potential for California
Spring, 2003
This map shows the relative intensity of ground shaking and damage in California from anticipated future earthquakes. Although the greatest hazard is in the areas of highest intensity as shown on the map, no region within the state is immune from potential for earthquake damage. Expected damages in California in the next 10 years exceed $30 billion.
Important messages about earthquakes for Californians to remember:
Earthquakes have produced over $55 billion in losses in California since 1971. The next large earthquake may produce even greater losses, especially if it affects a major urban area. California's two largest urban centers lie in the State's highest seismic hazard zones.
A large earthquake in or near a major urban center in California will disrupt the economy of the entire State and much of the nation. Effective disaster planning by State and local agencies, and by private businesses, can dramatically reduce losses and speed recovery.
Current building codes substantially reduce the costs of damage from earthquakes, but the codes are intended only to prevent widespread loss of life by keeping the building from collapsing, not to protect the building from damage.
If the Northridge or Loma Prieta earthquakes had occurred closer to a major population center, fatalities would have been much higher. The earthquakes in Japan (over 5,000 deaths), Taiwan (over 2,000 deaths), and Turkey (over 20,000 deaths) produced catastrophic death tolls.
After a large earthquake, residents and businesses may be isolated from basic police, fire, and emergency support for a period ranging from several hours to a few days. Citizens must be prepared to survive safely on their own, and to aid others, until outside help arrives.
Maps of the shaking intensity after the next major earthquake will be available within minutes on the Internet. The maps will guide emergency crews to the most damaged regions and will help the public identify the areas most seriously affected.
Efforts to reduce the losses from earthquakes have already proven effective. California's enhanced building codes; strengthened highway structures; higher standards for school and university, police and fire station construction; and well prepared emergency management and response agencies, reduced deaths, injuries and damage in recent earthquakes. Strengthening of older buildings, gaining a better understanding of California's earthquake threat, and continued education and preparedness will pay an even greater dividend to Californians in speeding response and recovery after future earthquakes.
Three-quarters of Our Nation's Earthquake Losses will be in California
Level of Earthquake Hazard
These regions are near major, active faults and will on average experience stronger earthquake shaking more frequently. This intense shaking can damage even strong, modern buildings.
Increasing Intensity
These regions are distant from known, active faults and will experience lower levels of shaking less frequently. In most earthquakes, only weaker, masonry buildings would be damaged. However, very infrequent earthquakes could still cause strong shaking here.
County boundaries
Highways
Water
0 25 50 Miles
0 25 50 Kilometers
DEL NORTE
SISKIYOU
MODOC
HUMBOLDT
TRINITY
SHASTA
LASSEN
TEHAMA
PLUMAS
BUTTE
GLENN
SIERRA
MENDOCINO
COLUSA
YUBA
NEVADA
PLACER
LAKE
SUTTER
YOLO
EL DORADO
ALPINE
SONOMA
NAPA
AMADOR
SOLANO
SACRAMENTO
MARIN
CALAVERAS
TUOLUMNE
MONO
SAN JOAQUIN
CONTRA COSTA
SAN FRANCISCO
ALAMEDA
STANISLAUS
MARIPOSA
SAN MATEO
SANTA CLARA
MERCED
MADERA
SANTA CRUZ
INYO
SAN BENITO
FRESNO
TULARE
MONTEREY
KINGS
KERN
SAN LUIS OBISPO
SAN BERNARDINO
SANTA BARBARA
VENTURA
LOS ANGELES
RIVERSIDE
ORANGE
IMPERIAL
SAN DIEGO
USGS

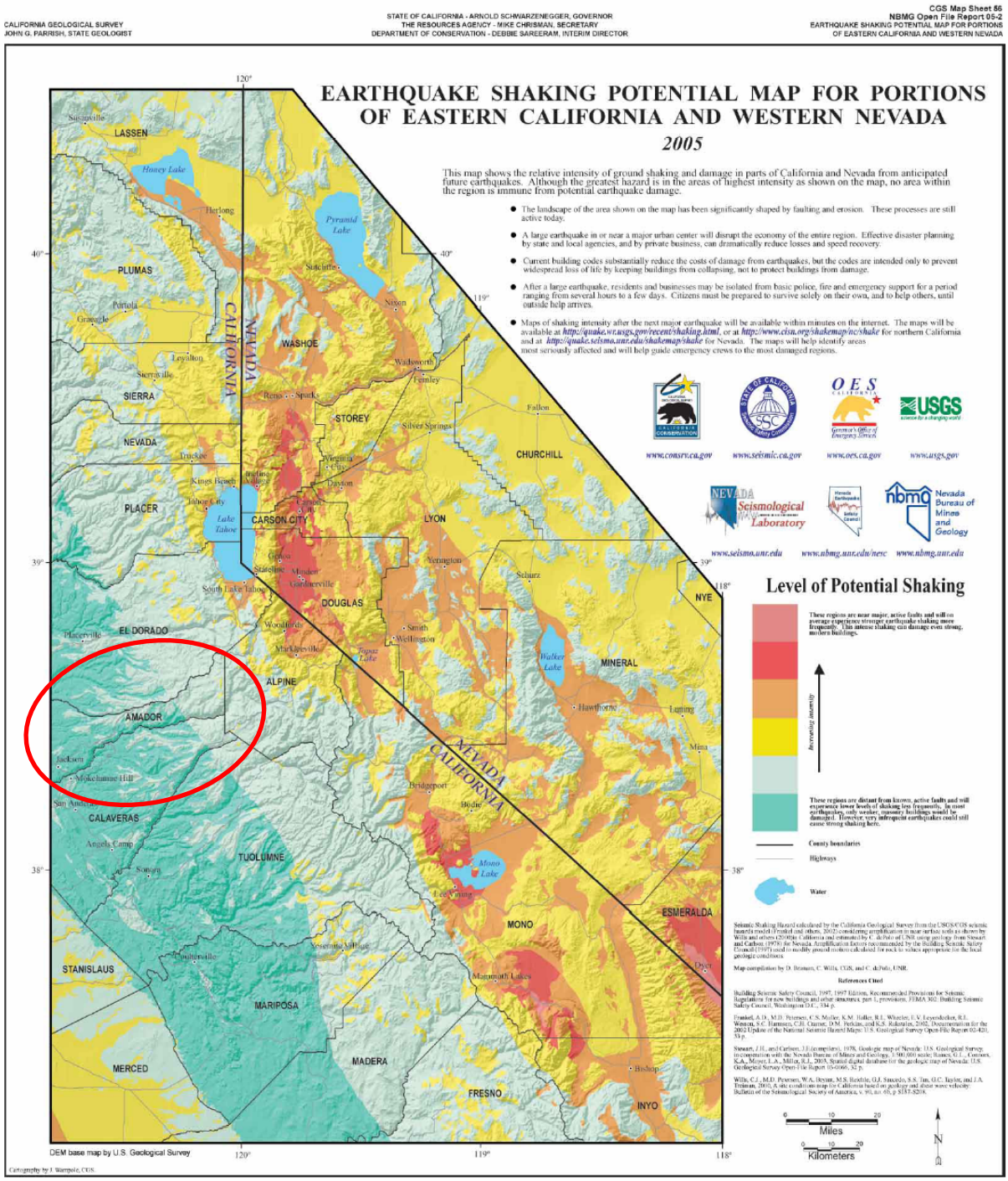
Interactive Ground Motion Map - Centered on 121° W (Longitude); 39° N (Latitude)

Peak Ground Acceleration - 10% of being exceeded in 50 years



(Source: http://www.consrv.ca.gov/CGS/rghm/pshamap/psha12139.html)

The map (on the following page) recently developed by the Department of Conservation's California Geological Survey shows earthquake shaking potential in the Reno-Tahoe and surrounding areas, including Amador County. Because of its location, the seismic hazard in this area is related to faults on both sides of the California-Nevada border. Based on this data, the eastern portion of the County is at greater risk from earthquakes.


CALIFORNIA GEOLOGICAL SURVEY
JOHN G. PARRISH, STATE GEOLOGIST
STATE OF CALIFORNIA - ARNOLD SCHWARZENEGGER, GOVERNOR
THE RESOURCES AGENCY - MIKE CHRISMAN, SECRETARY
DEPARTMENT OF CONSERVATION - DEBBIE SAREERAM, INTERIM DIRECTOR
CGS Map Sheet 55
NBMG Open File Report 05-2
EARTHQUAKE SHAKING POTENTIAL MAP FOR PORTIONS OF EASTERN CALIFORNIA AND WESTERN NEVADA
EARTHQUAKE SHAKING POTENTIAL MAP FOR PORTIONS OF EASTERN CALIFORNIA AND WESTERN NEVADA
2005
This map shows the relative intensity of ground shaking and damage in parts of California and Nevada from anticipated future earthquakes. Although the greatest hazard is in the areas of highest intensity as shown on the map, no area within the region is immune from potential earthquake damage.
The landscape of the area shown on the map has been significantly shaped by faulting and erosion. These processes are still active today.
A large earthquake in or near a major urban center will disrupt the economy of the entire region. Effective disaster planning by state and local agencies, and by private business, can dramatically reduce losses and speed recovery.
Current building codes substantially reduce the costs of damage from earthquakes, but the codes are intended only to prevent widespread loss of life by keeping buildings from collapsing, not to protect buildings from damage.
After a large earthquake, residents and businesses may be isolated from basic police, fire and emergency support for a period ranging from several hours to a few days. Citizens must be prepared to survive solely on their own, and to help others, until outside help arrives.
Maps of shaking intensity after the next major earthquake will be available within minutes on the internet. The maps will be available at http://quake.wr.usgs.gov/recent/shaking.html, or at http://www.cisn.org/shakemap/nc/shake for northern California and at https://quake.seismo.unr.edu/shakemap/shake for Nevada. The maps will help identify areas most seriously affected and will help guide emergency crews to the most damaged regions.
www.consrv.ca.gov
www.seismic.ca.gov
www.oes.ca.gov
www.usgs.gov
www.seismo.unr.edu
www.nbmg.unr.edu/nesc
www.nbmg.unr.edu
Level of Potential Shaking
These regions are near major, active faults and will on average experience stronger earthquake shaking more frequently. This intense shaking can damage even strong, modern buildings.
Increasing severity
These regions are distant from known, active faults and will experience lower levels of shaking less frequently. In most earthquakes, only weaker, masonry buildings would be damaged. However, very infrequent earthquakes could still cause strong shaking here.
County boundaries
Highways
Water
Seismic Shaking Hazard calculated by the California Geological Survey from the USGS/CGS seismic hazard model (Frankel and others, 2002) considering amplification in near-surface soils as shown by Wills and others (2000) in California and estimated by C. duPont of UNR using geology from Stewart and Carlson (1978) for Nevada. Amplification factors recommended by the Building Seismic Safety Council (1997) used to modify ground motions calculated for rock to values appropriate for the local geologic conditions.
Map compilation by D. Branum, C. Wills, CGS, and C. duPont, UNR.
References Cited
Building Seismic Safety Council, 1997, 1997 Edition, Recommended Provisions for Seismic Regulations for new buildings and other structures, part 1, provisions, FEMA 302: Building Seismic Safety Council, Washington D.C., 354 p.
Frankel, A. D., M.D. Petersen, C.S. Mueller, K.M. Haller, R.L. Wheeler, E.V. Leyendecker, R.L. Wesson, S.C. Harmsen, C.H. Cramer, D.M. Perkins, and K.S. Rukstales, 2002, Documentation for the 2002 Update of the National Seismic Hazard Maps: U.S. Geological Survey Open-File Report 02-420, 33 p.
Stewart, J.H., and Carlson, J.E. (compilers), 1978, Geologic map of Nevada: U.S. Geological Survey, in cooperation with the Nevada Bureau of Mines and Geology, 1:500,000 scale; Stamos, G.L., Conners, K.A., Moyer, L.A., Miller, R.J., 2003, Spatial digital database for the geologic map of Nevada: U.S. Geological Survey Open-File Report 03-066, 32 p.
Wills, C.J., M.D. Petersen, W.A. Bryant, M.S. Reichle, G.J. Saucedo, S.S. Tan, G.C. Taylor, and J.A. Treiman, 2000, A site conditions map for California based on geology and shear wave velocity: Bulletin of the Seismological Society of America, v. 90, no. 6b, p. S187-S208.
Miles
Kilometers
N
DEM base map by U.S. Geological Survey
Cartography by J. Wampole, CGS
LASSEN
PLUMAS
SIERRA
NEVADA
PLACER
EL DORADO
AMADOR
ALPINE
CALAVERAS
TUOLUMNE
STANISLAUS
MARIPOSA
MERCED
MADERA
FRESNO
INYO
MONO
ESMERALDA
NYE
MINERAL
LYON
CHURCHILL
DOUGLAS
CARSON CITY
WASHOE
STOREY
CALIFORNIA
NEVADA
Honey Lake
Pyramid Lake
Lake Tahoe
Topaz Lake
Walker Lake
Mono Lake
Susanville
Herlong
Portola
Graeagle
Loyalton
Sierraville
Truckee
Reno
Sparks
Wadsworth
Fernley
Fallen
Silver Springs
Virginia City
Dayton
Kings Beach
Tahoe City
South Lake Tahoe
Stateline
Minden
Gardnerville
Genoa
Placerville
Woodfords
Markleeville
Jackson
Mokelumne Hill
San Andreas
Angels Camp
Sonora
Coulterville
Yosemite Village
Mammoth Lakes
Bridgeport
Bodie
Lee Vining
Hawthorne
Luning
Mina
Schurz
Yerington
Smith
Wellington
Bishop
Dyer
120°
119°
118°
40°
39°
38°

AVALANCHE

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 and 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 create an avalanching episode. Avalanche hazards exist in eastern Amador County, where combinations of the above criteria occur.

Past Occurrences

Historically, avalanches occur within the County between the months of January and March, following snowstorms. Areas prone to avalanche hazards include the following areas within the County:

- Highway 88, Devils Gate Area
- Kirkwood Resort, Ski Area

Highway 88 and Devils Gate area. With respect to Highway 88, Caltrans is responsible for avalanche mitigation. There have been no known fatalities or injuries within this area. In 1982/1983, an avalanche destroyed some USFS lease summer cabins located west of Highway 88. The cabins are only allowed to be occupied during the summer months, and no one was injured.

Kirkwood Resort Ski area. With respect to avalanche hazards in the Kirkwood Resort Area, there have been no avalanche related fatalities, injuries, or property damage within Amador County during the existence of the Kirkwood Ski Resort since 1972/1973. The avalanche search and rescues at the resort that have taken place have all been on the Alpine County side. However, there are approximately 50 major avalanche starting zones in Amador County that were mapped by an avalanche consultant prior to the formation of the ski resort. The avalanche zones are within Kirkwood's Special Use Permit (SUP) boundary on Forest Service land. Another 50 plus major avalanche starting zones are in Alpine County in the SUP boundary. According to representatives from the resorts, the number of avalanches over the years in these areas would total in the thousands. There are a few starting zones that, while within the SUP, are outside of the current ski area boundary. Some avalanche control work has been done in this area over the years. Some of these starting zones are actually above existing housing in Amador County and nearest to Highway 88. The potential for a serious avalanche accident during a 100-year type of weather event is greatest in this area of Amador County at Kirkwood.

In 1982/1983, the mountain manager for Kirkwood ordered an evacuation of homes in this area during a multiple day Sierra snow storm. A representative from Kirkwood provided one unconfirmed report of a local skier getting caught in an avalanche and digging out and skiing away. It is likely that other avalanche incidents such as this one go unreported.

In 1993, a man was buried in an avalanche in Kirkwood's Button Bowl. He was buried for nearly 15 minutes under five feet of snow before he was discovered by one of the resort's avalanche rescue dogs. He survived, but suffered a broken back and ribs.

The Kirkwood Ski Area has conducted a series of Design-Magnitude Avalanche Mapping and Mitigation Analyses to guide future development of the area. Design-magnitude avalanches are of a size and destructive potential that should be considered in land-use planning and engineering. The design-magnitude avalanche path boundaries are subdivided into "red", "blue" and "white" zones which indicate the potential hazard severity based on the resulting impact pressure and return period (or frequency). Land use recommendations and restrictions are then applied to the identified hazard zones. This methodology for the identification of avalanche zones and the associated land use recommendations is relatively unique to the United States, and is based on similar methodologies used in other countries with development in and near avalanche areas (e.g., Switzerland and Austria). A summary of land use recommendations for identified zones is provided below.

Red Zone (High Hazard) – Residential development within the red zone is not recommended. Avalanche pressure potentials are beyond the practical design limits of most residential structures; avalanche frequency is high; and detached structural protection is difficult or impossible to build. Additionally, any development that concentrates human activity in Red zones (e.g., ski-lift terminals, ticket areas, parking lots, trail heads, skating ponds, and public buildings) should be avoided. Even though structural protection of some facilities might be feasible, people standing or working outside of these facilities could be exposed to avalanches. Road construction through some red zones might be acceptable unless the frequency of avalanches is high. Utilities should be buried whenever possible.

Blue Zone (Moderate Hazard) – By definition, blue zones are subject to much lower levels of avalanche frequency and energy than red zones. Thus construction of private buildings may be acceptable, but only if reinforced or protected for design avalanche loads. Even with structural protection, property owners must be made aware of the fact that living in an area designated as a blue zone means assuming the possibility of property damage or personal injury from avalanches because people outside may be exposed. Because of the potential for a greater concentration of people at public facilities, construction of public buildings in blue zones should be avoided. Other public facilities such as parking lots and ski-lift terminals should, if possible, be located near the outer limits of the blue zone and the area should be posted as potentially hazardous. Utilities should be buried. Road construction is acceptable.

White Zone (Hazard Free) – There are no identified land use recommendations or development restrictions associated with Hazard Free White Zones.

Likelihood of Future Occurrences

Likely: Given the topography and amount of snow falling on an annual basis in Eastern Amador County, avalanches will continue to occur. The loss of life due to an avalanche is usually due to people recreating in remote areas at the wrong time. Avalanche warnings are posted after winter storms; therefore, information is available to reduce the risk of being caught in one.

AGRICULTURAL HAZARD

Amador County is geographically and ecologically diverse, extending from the western edge of California's Central Valley east into the Sierra Nevada Mountains. Foothill growers produce a wide diversity of crops in a range of microclimates.

Amador County is home to over 375 farms that cover about 60 percent of its 363,500 acres. Over 3,500 acres of grapes were harvested in 2003, including Zinfandel, Sangiovese, Merlot, Cabernet Sauvignon, Syrah, and many more. Some of these are sold wholesale while others are turned into fine wines at one of the many local wineries in the county.

Livestock products such as beef, sheep, pigs, and goats are also raised in Amador County and contribute $7 million dollars to the local economy.

Fresh fruits and vegetables including peppers, cucumbers, tomatoes, carrots, celery, peas, beans, quinces, prunes, blackberries, and pumpkins, not to mention numerous other goods including walnuts, can be found at farmer's markets held throughout the county.

According to the 2004 Crop report, the 2004 total gross value for all agricultural commodities was $32,840,860. This represents an increase of 13.55% from the 2003 gross production values due to higher prices for grapes and cattle. It should also be noted that there was a 68% drop in timber production in Amador County in 2004. This report reflects the gross value of agricultural products and not the net income growers receive.

These production values only partially reflect the overall measure of the economic impact agriculture has on the local economy. Processing, transporting, marketing and other farm related services significantly multiply the value agriculture has to Amador County.

According to the HMPC, agricultural losses occur on an annual basis throughout the County and are usually associated with severe weather events. California is also at risk from many insects that, under the right circumstances, can cause severe economic and environmental harm to the agricultural industry. Insects of concern to plants and crops include: Asian longhorn beetle, Caribbean fruit fly, Glassy-winged sharp shooter, Guava fruit fly, Gypsy moth, Japanese beetle, Mediterranean fruit fly, Melon fruit fly, Mexican fruit fly, Olive fruit fly, Oriental fruit fly, and Bark beetle. According to the Draft California Multi-Hazard Mitigation Plan, the primary causes of agricultural disasters in California are associated with drought, freeze, and insect infestations.

Past Occurrences

The Draft State Multi-Hazard Mitigation Plan indicates that Amador County has not experienced any federal agricultural disaster proclamations between 1950 and 1997. The plan also looks at drought, freeze and insect disaster proclamations as indicative of potential loss to crops and provides the following Federal disaster declaration data for Amador County:

- Two disaster declarations for drought since 1972. These occurred in 1976/1977 and in 2002.
- Zero disaster declarations for freeze since 1950
- Zero disaster declarations for insect infestations since 1950

In addition to the two federally declared disaster declarations (i.e., drought) associated with Agricultural losses in Amador County, the following table includes information from USDA Damage Assessment Reports for agricultural damages related to drought. The 2002 drought event listed below is likely the same event that resulted in the 2002 Federal Disaster Declaration for drought.

Amador County
USDA Damage Assessment Report

Date	Description	Monetary Loss	% of Loss
1/2001-12/2002	Drought damage to dryland forage - 40,000 acres west side of Amador	$294,800	67% loss to forage and range production.
3/2004 – ongoing	Drought and lack of feed - Countywide	$1,340,034	46% loss to range and forage production

Likelihood of Future Occurrences

Likely: As long as severe weather events continue to be an ongoing concern to Amador County, the potential for agricultural losses remain.

DAM FAILURE

Dams are man-made structures built for a variety of uses including flood protection, power, agriculture, water supply, and recreation. When dams are constructed for flood protection, they usually are 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 a larger flood occurs, then that structure will be overtopped. Overtopping is the primary cause of earthen dam failure in the United States. Failed dams can create floods that are catastrophic to life and property as a result of the tremendous energy of the released water. A catastrophic dam failure could easily overwhelm local response capabilities

and require mass evacuations to save lives. Impacts to life safety will depend on the warning time available and the resources to notify and evacuate the public. Major loss of life could result and there could be associated health concerns as well as problems with the identification and burial of the deceased.

Dams typically are constructed of earth, rock, concrete, or mine tailings. Two factors that influence the potential severity of a full or partial dam failure include:

- The amount of water impounded, and
- The density, type, and value of development and infrastructure located downstream.

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

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

There are several major and minor dams, which, if they fail, may impact the people and resources of Amador County. According to information provided by the HMPC, four Dams in Amador County have a capacity of 10,000 acre-feet of water or greater. Nineteen smaller dams are located throughout the county. Failure of any one of these dams would flood downstream areas and could cause loss of life and property.

The table on the following page of dams provided by the HMPC identifies Amador County dams located within the jurisdiction of the State of California and that are owned or operated by a federal agency.

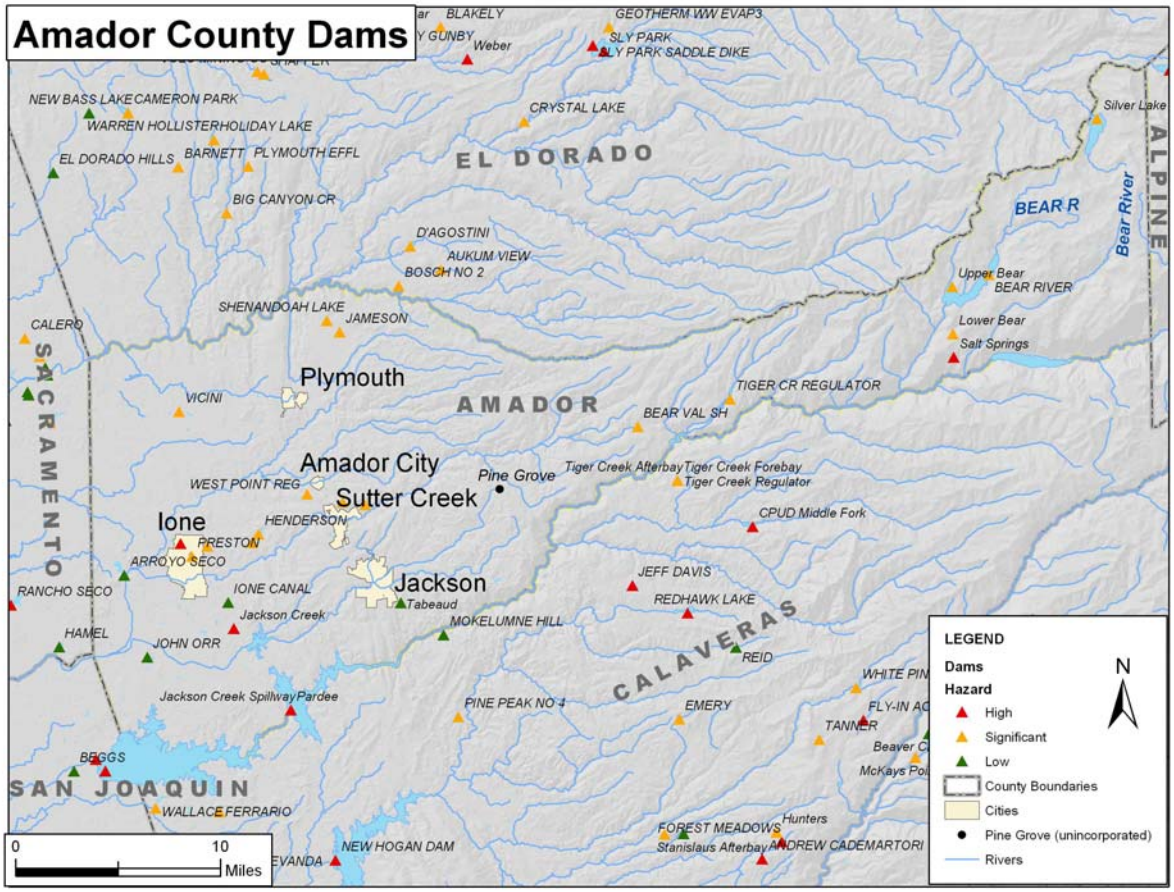
Amador County Federal Dam Inventory				
Name	**Capacity* (in acre feet)**	**Dam Number**	**Type**	**Hazard Ranking**
Arroyo Seco	2433	471-000	Earth	Low
Bear River	6757	97-061	Rock	Significant
CSP Mule Creek	535	1-081	Earth	High
Electra Diversion	65	97-114	Gravel	?
Goffinet	197	470-000	Earth	Significant
Henderson	500	2029-000	Earth	Significant
Ione Canal	24	2035-000	Earth	Low
Jackson Creek	22,000	1035-000	Earth	High
John Orr	152	483-000	Earth	Low
Lake Tabeaud	1,170	97-067	Earth	High
Lower Bear River	52,025	97-115	Rock	Significant
Pardee	210,000	31-004	Gravel	High
Plymouth Effl	187	489-000	Earth	Significant
Preston	268	2029-003	Earth	Significant
Preston Forebay	30	2029-002	Earth	Significant
Salt Springs	141,900	97-066	Rock	High
SGV Waste Pond #2		1470-000	Earth	Significant
Shenandoah Lake	168	486-000	Earth	Significant
Silver Lake	3840	97-058	Crib	Significant
Tiger CR Afterbay	3960	97-105	Vara	?
Tiger CR Regulator	523	97-104	Slbt	Significant
Tiger Creek FB	36	97-126	Earth	Low
Vicini	150	487-000	Earth	Significant

*One Acre Foot=326,000 gallons

Based on the National Inventory of Dams database provided with FEMA's HAZUS loss estimation software, there are 28 dams rated as "high" or "significant" hazard that could potentially impact Amador County if a failure were to occur. This includes dams that may lie in

neighboring counties that drain into Amador County. Seven of the 28 dams are classified as "high" hazard. Twenty-one are rated as a "significant" hazard. The database also identifies four additional dams within Amador County rated as "low" hazard.

The following map illustrates the locations of identified dams within and surrounding Amador County.



(Map Compilation: AMEC Earth & Environmental; Source data: HAZUS, CA-OES)

Past Occurrences

According to the HMPC, there have been no dam failures within or affecting Amador County.

Likelihood of Future Occurrences

Unlikely: Historically, there have been no dam failure flood events in the County. The County is potentially at risk from numerous dams under a variety of ownership and control and of varying ages and conditions. As a result, the potential exists for future dam failures in Amador County.

DROUGHT

Drought is a complex issue involving many factors, with differing conditions and drivers throughout the state making this more of a regional focus. Drought can be defined regionally based on its effects:

- Meteorological – this type of drought is usually defined by a period of below average water supply.

- Agricultural – this type of 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.

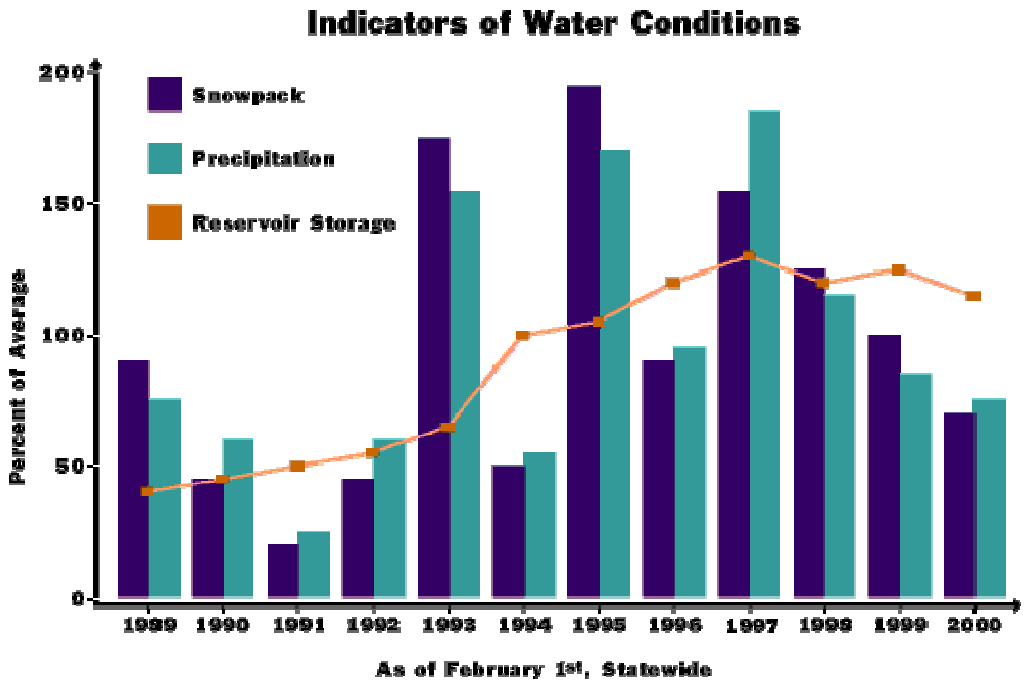
- Hydrological – a hydrological drought is defined as deficiencies in surface and subsurface water supplies. It is generally measured as stream flow, snowpack, and as lake, reservoir and groundwater levels.

- Socioeconomic – a socioeconomic drought occurs when the results of drought impacts the health, well being, and quality of life, or when a drought starts to have an adverse economic impact on a region.

According to the California Department of Water Resources (DWR), drought is defined as follows: "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 is further compounded by water-rights specific to any state or region. Water is a commodity possessed under a variety of legal doctrines. In addition, the prioritization of water rights between farming and federally protected fish habitats in the state is also at issue.

The graphic on the following page, from the California DWR website, illustrates several indicators commonly used to evaluate California water conditions. The percent of average values are determined for measurement sites and reservoirs in each of the State's ten major hydrologic regions. Snowpack is an important indicator of runoff from Sierra Nevada watersheds, the source of much of California's developed water supply.



(Source: California DWR Website)

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 multiyear period. There is no universal definition of when a drought begins or ends. Impacts of drought are typically felt first by those most reliant on annual rainfall—ranchers engaged in dryland grazing, rural residents relying on wells in low-yield rock formations, or small water systems lacking a reliable source. Criteria used to identify statewide drought conditions do not address these localized impacts. Drought impacts increase with the length of a drought, as carry-over supplies in reservoirs are depleted and water levels in groundwater basins decline.

Past Occurrences

Historically, California has experienced multiple severe drought conditions. According to the DWR website, 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. The table below compares the 1929-34 drought in the Sacramento and San Joaquin Valleys to the 1976-77 and 1987-92 droughts. The driest single year of California's measured hydrologic record was 1977. California's most recent multi-year drought was 1987-92.

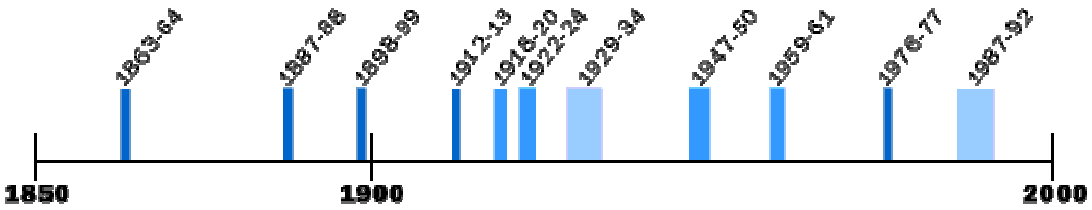
Severity of Extreme Droughts in the Sacramento and San Joaquin Valleys				
Drought Period	**Sacramento Valley Runoff**		**San Joaquin Valley Runoff**	
	(maf/yr)	***(% Average 1901-96)***	***(maf/yr)***	***(% Average 1906-96)***
1929-34	9.8	55	3.3	57
1976-77	6.6	37	1.5	26
1987-92	10.0	56	2.8	47

(Source: California DWR Website)

Based on additional information provided by the DWR, measured hydrologic data for droughts prior to 1900 are minimal. Multi-year dry periods in the second half of the 19th century can be qualitatively identified from the limited records available combined with historical accounts, as illustrated in the figure below, but the severity of the dry periods cannot be directly quantified.

California's Multi-Year Historical Dry Periods

1850 - Present



1. Dry periods prior to 1900 estimated from limited data.
2. Covers dry periods of statewide or major regional extent.

(Source: California DWR Website)

With respect to Amador County, the following relatively recent drought events were identified by the HMPC:

- In 1976, a Federal Disaster Declaration was declared as a result of a drought affecting Amador County and much of California.

- 2001-2002 drought conditions existed predominantly on the west side of Amador County, with severe impacts to the agricultural industry.

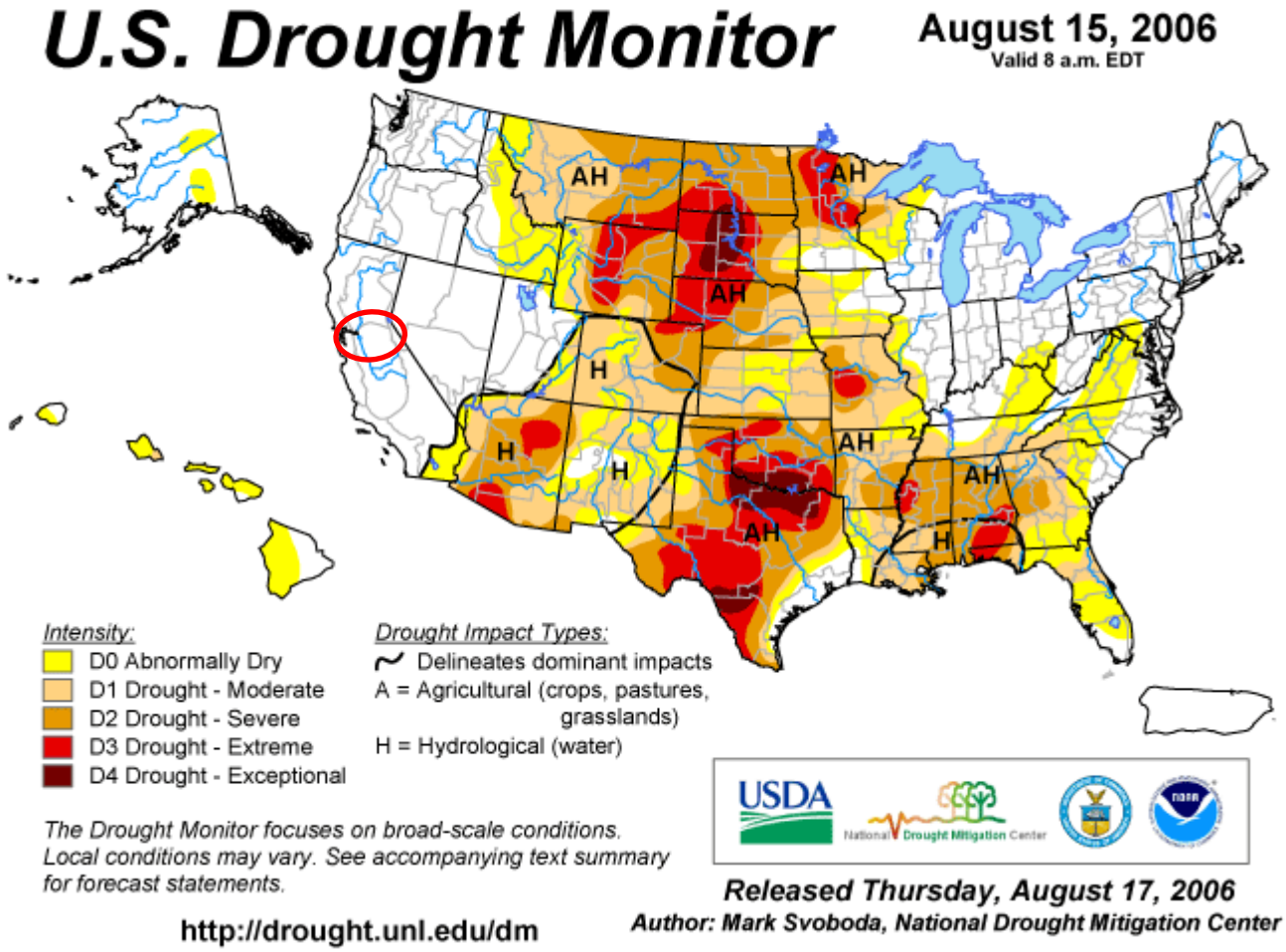
- In 2004, drought conditions existed on a County-wide basis, with significant losses to the agricultural industry.

No hard costs for these emergencies were identified, although the Amador Water Agency (AWA) did incur increased operating costs and extra expenses along with an effect on revenue.

Other periods of identified drought have impacted the County, including USDA designations and SBA declarations for drought events affecting agriculture from 2001 to present. These include the following:

- **USDA Designation # S1970:** 7/1/2003 to 6/30/2004 designating Amador County as a Contiguous affected county.
- **USDA Designation #S2020:** 1/1/2004 to 9/19/2005 designating Amador County as a Primary affected county.
- **SBA Declaration #9AI4:** Making Amador County eligible for Economic Injury Disaster Loans for impacts from July 2003 through June 2004.
- **SBA Declaration#10009:** Making Amador County eligible for Economic Injury Disaster Loans and to cover the impact of reduced revenue caused by drought conditions from January 2004 through September 2005.

The map that follows provides a "snapshot in time" perspective of the current drought conditions during August of 2006. According to the U.S. Drought Monitor, Amador County and California are not currently in a drought situation. This map considers several factors including the Palmer Drought Index, Soil Moisture Models, United States Geological Survey (USGS) Weekly Streamflows, Standardized Precipitation Index, and Satellite Vegetation Health Index.



Likelihood of Future Occurrences

Likely: Historical drought data for Amador County and the Sacramento and San Joaquin Valley regions indicate there have been five multi-year droughts in the last 76 years. This equates to a drought occurring every 15.2 years on average, or a 6.6% chance of a drought any given year. Based on this historical data, droughts affecting Amador County will likely continue to occur on a cyclic basis.

Generally, about 75 percent of California's average annual precipitation falls between November and March; half occurs between December and February. A persistent high-pressure zone over California during the December through February period usually results in a dry water year. Northern California is much wetter than Southern California. More than 70 percent of California's average annual precipitation and runoff occurs in the northern part of the State. The amount of precipitation over the next few years will be a major factor in determining the future drought situation in Amador County.

LANDSLIDES/DEBRIS FLOWS

Landslides refer to a wide variety of processes that result in the perceptible downward and outward movement of soil, rock, and vegetation under gravitational influence. Common names for landslide types include slump, rockslide, debris slide, lateral spreading, debris avalanche, earth flow, and soil creep. Although landslides are primarily associated with steep slopes (i.e., >15%), they may also occur in areas of generally low relief and occur as cut-and-fill failures; river bluff failures, lateral spreading landslides; collapse of wine-waste piles; failures associated with quarries and open-pit mines. Landslides may be triggered by both natural and human-induced changes in the environment resulting in slope instability.

Another type of landslide, debris flows, also occur in some areas of the County. These debris flows generally occur in the immediate vicinity of existing drainage swales or steep ravines. Debris flows occur when near surface soil in or near steeply sloping drainage swales becomes saturated during unusually heavy precipitation and begins to flow downslope at a rapid rate.

Precipitation, topography, and geology affect landslides and debris flows. Human activities such as mining, construction, and changes to surface drainage areas also affect the landslide potential. Landslides often accompany other natural hazard events, such as floods, wildfires, or earthquakes. Landslides can occur slowly or very suddenly and can damage and destroy structures, roads, utilities, forested areas and can cause injuries and death.

Past Occurrences

The Draft California Multi-Hazard Mitigation Plan indicates there have been no disaster declarations between 1950 and 1997 associated with landslides in Amador County. However, there are certain areas within the County that are susceptible to slope failure resulting in localized landslides, mudslides, and debris flows. Areas identified by the County with historic problems include those listed below. A map showing the location of these areas is included on page 28.

Unincorporated Amador County

Landslides/Mudslides

- Latrobe Road
- Michigan Bar Road
- Comanche Parkway No.
- Shakeridge Road
- Charleston Road
- Rams Horn Grade
- Sutter Creek Road

- Climax Road
- Middle Bar Road
- Electra Road

Debris Flows

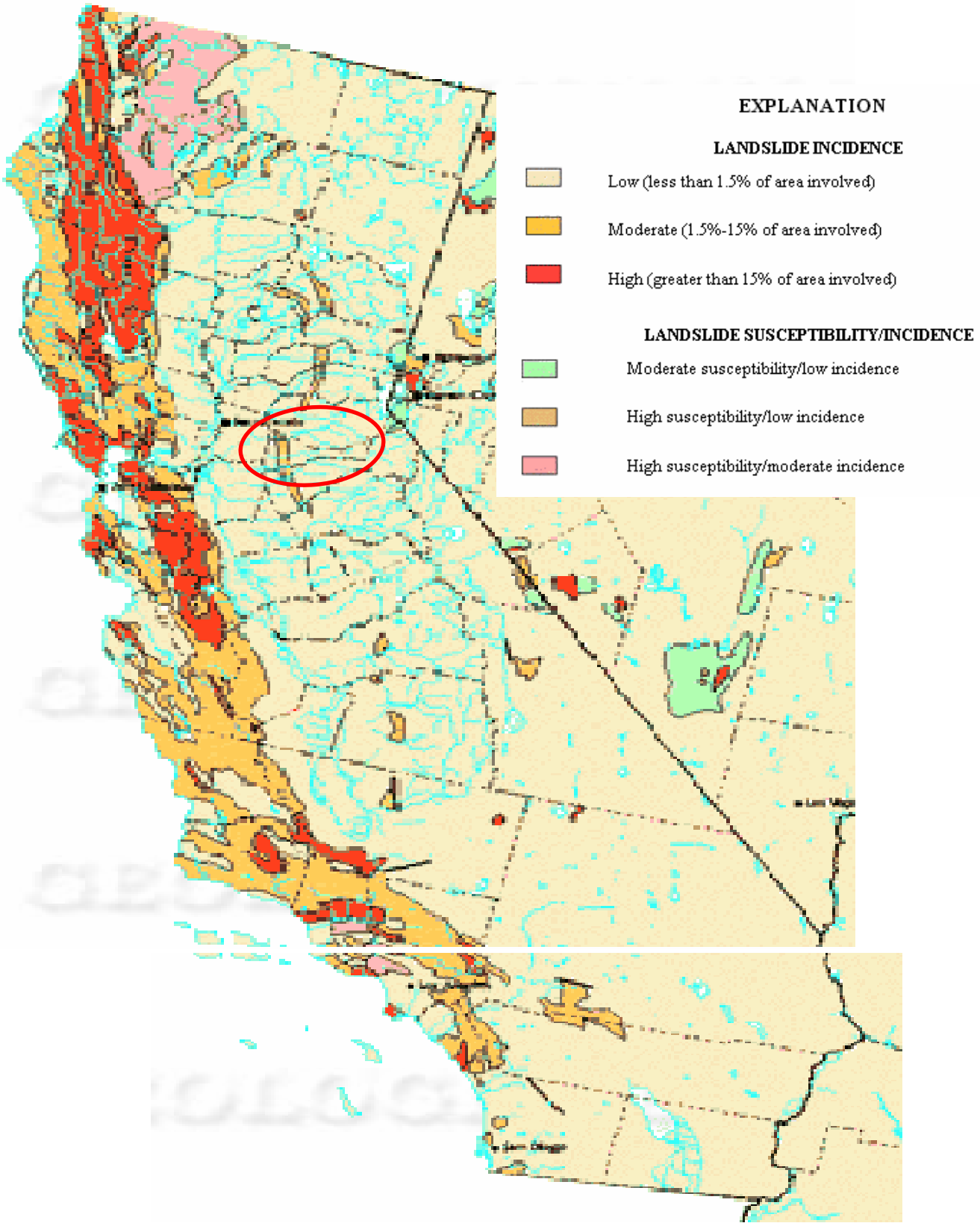
- Comanche Road Bridge
- Sutter Creek Road
- Pine Grove/Volcano Road

According to representatives from Sutter Creek, an area on highway 49 between Sutter Creek and Amador City has experienced landslides in the past.

Likelihood of Future Occurrences

Occasional: Although there are some areas within the County susceptible to slope failure, primarily as a result of severe weather, the landslide risk map (on the following page) developed for the Draft State Multi-Hazard Mitigation Plan identifies most of Amador County at low risk for landslides. However, the map indicates an area within the western portion of the County at moderate risk to landslides. Based on data provided by the HMPC, landsliding has occurred locally numerous times in the past, probably over the last several hundred years, as evidenced both by past deposits exposed in erosion gullies and recent landslide events. With significant rainfall, additional failures are likely. Given the nature of localized problems identified within the County, landslides and debris flows will likely continue to impact the area when heavy precipitation occurs, as they have in the past.

Map 7.3B – Landslide Risk Zones



LAND SUBSIDENCE

Land subsidence is defined as the sinking of the land over man-made or natural underground voids. In Amador County, the type of subsidence of greatest concern is the settling of the ground over abandoned mine workings. Past mining activities have created surface subsidence in some areas and have created the potential for subsidence in other areas.

Subsidence can result in serious structural damage to buildings, roads, irrigation ditches, underground utilities and pipelines. It can disrupt and alter the flow of surface or underground water. Weight, including surface developments such as roads, reservoirs, and buildings, and man-made vibrations from such activities as blasting, heavy truck or train traffic can accelerate the natural processes of subsidence. Fluctuations in the level of underground waters caused by pumping or by injecting fluids into the earth can initiate sinking to fill the empty space previously occupied by water or soluble minerals. The consequences of improper utilization of land subject to ground subsidence generally consists of excessive economic losses. This includes high repair and maintenance costs for buildings, irrigation works, highways, utilities and other structures. This results in direct economic losses to citizens, and indirect losses through increased taxes and decreased property values.

Past Occurrences

The HMPC identified the following areas with past subsidence issues:

- Eureka Street, near the foundry
- Eureka Street, near Susan's Place, 2005
- Skunk Hollow, ongoing

Likelihood of Future Occurrences

Occasional: Historically, land subsidence issues in the County have been minimal. However, given the history of mining activity within Amador County, the potential exists for subsidence to occur. If properly identified and managed, it is unlikely to be a significant concern.

NATURAL HEALTH HAZARDS

The impact to human health that wildlife and insects, can have upon an area is substantial. Two natural health hazards of concern in Amador County include West Nile Virus (WNV) and Rabies. These are discussed in the following sections.

West Nile Virus

A recent natural hazard to affect California is the West Nile Virus (WNV). Mosquitoes transmit this potentially deadly disease to livestock and humans. WNV first struck the United States in Queens, N.Y., in 1999 and killed four people. In 2003, all 50 states warned of an outbreak from

any of the 30 mosquito species known to carry it. From 62 severe cases in 1999, confirmed human cases of the virus spread to 39 states in 2002, and killed 284 people. Less than one percent of those infected develop severe illness. People over 70 years of age are at high risk for the severe aspects of the disease.

(Source: Amador County Website)

Amador County recognizes the potential for WNV to occur within the County and has initiated a public outreach campaign. The West Nile Task Force has prepared for the possible arrival of WNV the last two years through focused efforts on reducing the mosquito population and educating the public.

The County maintains records with dates and street addresses for all identified cases of the disease. However, due to residents' privacy concerns this information is not included in publicly disseminated documents. This information is available, however, on a need to know basis from the County Health Department.

Past Occurrences

WNV was detected on a very limited basis in horses and humans in California in 2003. San Diego County reported one veterinary case; Imperial County and Riverside County each reported one human case. According to the California West Nile Virus Surveillance Information Center sponsored by the California Department of Health Services, as of November 2, 2004, a total of 737 human WNV infections have been reported in 23 counties in the State. A total of 24 California residents died from WNV in 2004, with most deaths occurring in Southern California.

By August of 2004, WNV had arrived in Amador County. A dead bird discovered August 24 in Plymouth tested positive for the disease. As of September 2005, seven birds have tested positive in the County; these birds were from all areas of the County except the high country:

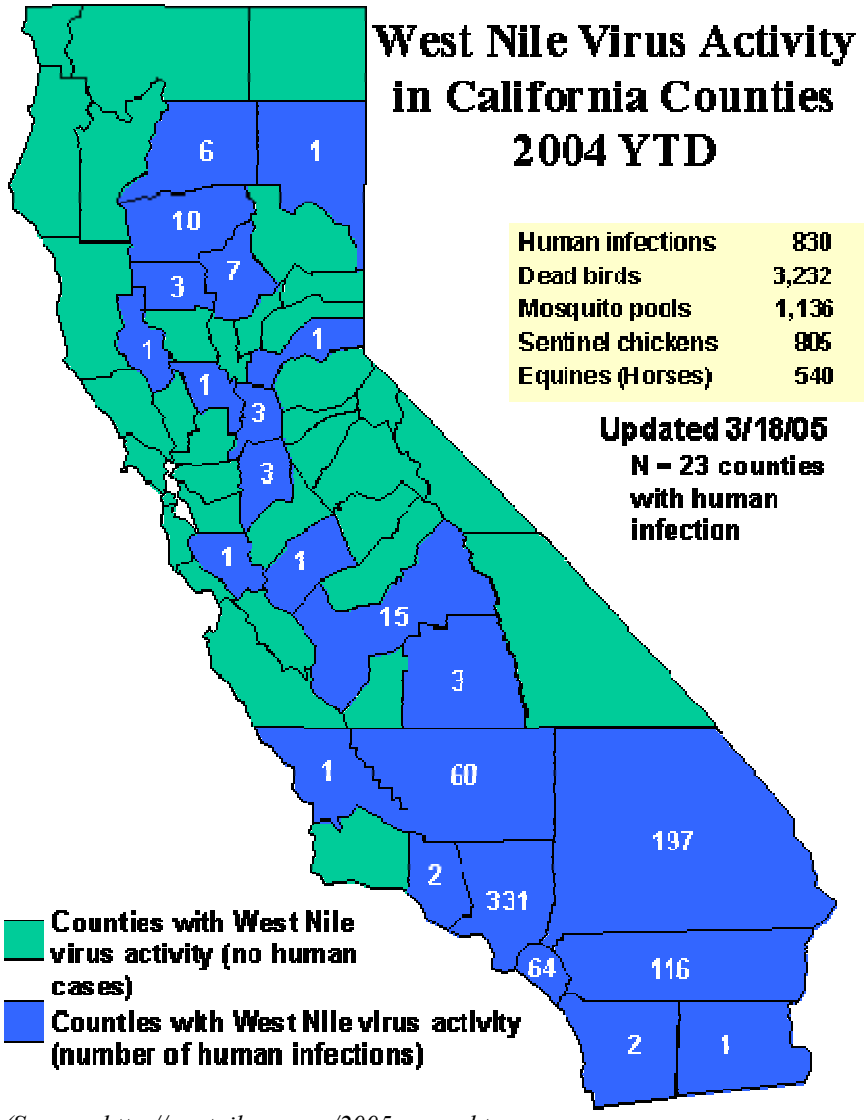
- August 24, 2004, Steller's Jay in Pine Grove
- August 30, 2005, a House Finch in Ione
- September 9, 2005, a Sparrow in Jackson
- September 14, 2005, a Gold Finch in Plymouth
- September 20, 2005, a Western Blue Bird in Jackson

- September 30, 2005, a Western Scrub Jay in Pioneer
- September 30, 2005, a Western Screech Owl in Volcano

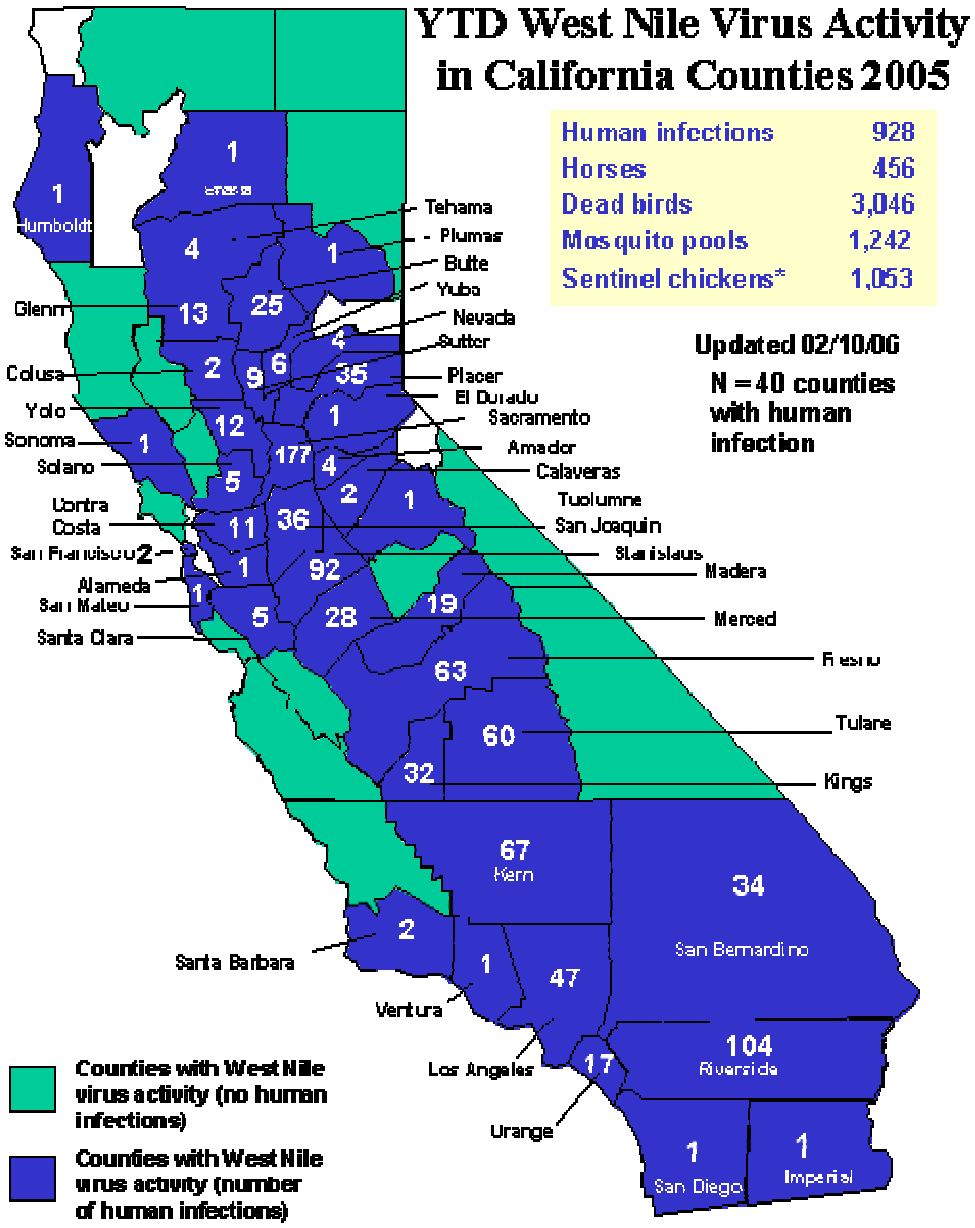
No equine or human cases were reported in 2004.

In 2005, Amador County had 24 positive birds, seven equine cases and four human cases. To date, there have been 928 human WNV cases in California from 40 counties, with 18 WNV fatalities, including one person (over 65) from Amador County.

WNV activity for 2004 and 2005 are illustrated in the following maps.



(Source: http://westnile.ca.gov/2005_maps.htm



(Source: http://westnile.ca.gov/2005_maps.htm)

For 2006, as of August 22, the following WNV activity in California and Amador County has been reported on the California West Nile Virus homepage.

- 47 counties have reported WNV activity in California
- 84 human cases have been identified in 19 counties; none in Amador County
- 16 equine cases have been identified in 10 counties; none in Amador County
- 586 dead bird have tested positive for WNV in 41 counties; none in Amador County

- 495 mosquito samples have tested positive for WNV in 30 counties; none in Amador County
- 233 chickens have developed antibodies to WNV from 18 counties; none in Amador County

Likelihood of Future Occurrences

Likely: Based on historical data, Amador County has experienced four human cases of WNV since its discovery in California in 2003. This is an average of 1.3 cases every year. The agricultural nature of much of Amador County combined with the great potential for standing water to be present in the area, puts Amador County at risk of WNV. The state will continue their surveillance for the disease in 2006.

Rabies

Rabies is a preventable viral disease of mammals most often transmitted through the bite of a rabid animal. The vast majority of rabies cases reported to the Centers for Disease Control and Prevention (CDC) each year occur in wild animals like raccoons, skunks, bats, and foxes. Domestic animals account for less than 10% of the reported rabies cases, with cats, cattle, and dogs most often reported rabid.

Rabies virus infects the central nervous system, causing encephalopathy and ultimately death. Early symptoms of rabies in humans are nonspecific, consisting of fever, headache, and general malaise. As the disease progresses, neurological symptoms appear and may include insomnia, anxiety, confusion, slight or partial paralysis, excitation, hallucinations, agitation, hypersalivation, difficulty swallowing, and hydrophobia (fear of water). Death usually occurs within days of the onset of symptoms.

Over the last 100 years, rabies in the United States has changed dramatically. More than 90% of all animal cases reported annually to CDC now occur in wildlife; before 1960 the majority were in domestic animals. The principal rabies hosts today are wild carnivores and bats. The number of rabies-related human deaths in the United States has declined from more than 100 annually at the turn of the century to one or two per year in the 1990's. Modern day prophylaxis has proven nearly 100% successful. In the United States, human fatalities associated with rabies occur in people who fail to seek medical assistance, usually because they were unaware of their exposure.

Past Occurrences

Amador County Rabies Task Force first convened in October 1999 as the result of numerous rabies situations that had arisen over the previous months, including a rabid cow and a rabid goat. Rabies exposures in Amador and nearby counties include the following:

September 2000 – A 49-year-old Amador County man died of rabies four days after being admitted to the hospital. This victim's death was the first attributed to rabies in California since 1995 and was caused by a virus variant associated with the Mexican Free-tailed bat.

April 2003 – A bat in Amador County tested positive for rabies.

June 2003 – A skunk in the Golden Hills subdivision of Mokelumne Hill, Calaveras County tested positive for rabies.

May 21, 2004 – A rabid bat is taken to school. As a result four people received rabies treatments.

According to the Amador County Health Department for the years ending 2003 and 2004, there were 264 and 244 calls relating to possible exposure. 75 animals were tested in 2003 with one bat testing positive; 70 animals were tested in 2004, with no positive results. For both 2003 and 2004, approximately 28% of all exposure reports resulted in testing. In 2003, post-exposure prophylaxis was given to 23 individuals and in 2004 to 22 individuals.

Likelihood of Future Occurrences

Likely: Based on the occurrence of rabies detected in both animals and humans within the County since the Rabies Task Force was convened in 1999, the risk of continued occurrence in the area is likely. In Amador County skunk rabies is endemic. While only a small percentage of bats and other wild animals have rabies in the County, once a bat is affected by the virus, they drop to the ground and are easily accessible to other animals and humans. Until the rabies virus is totally eliminated, rabies will likely continue to be present to some extent within the County.

VOLCANO

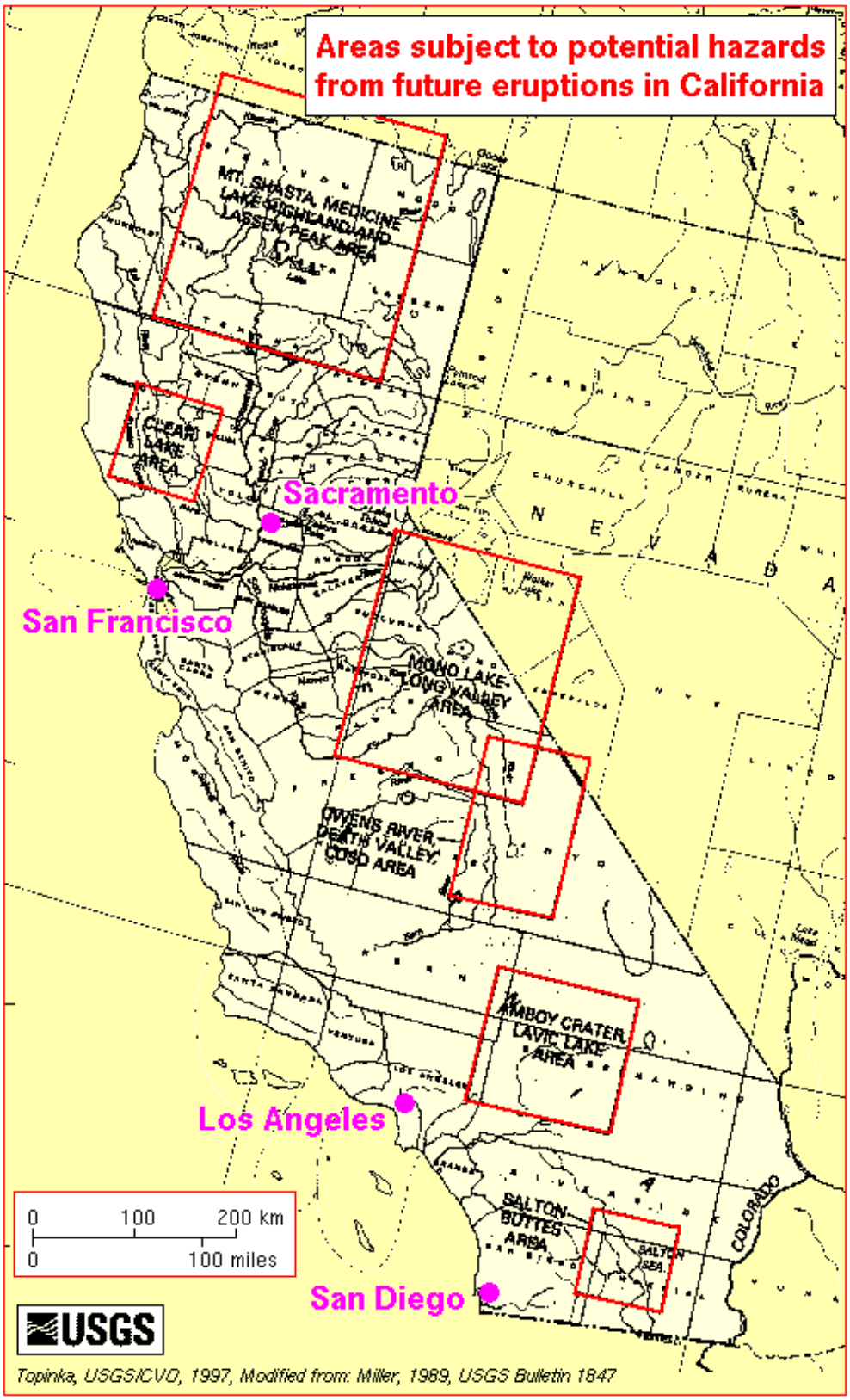
The Draft California Multi-Hazard Mitigation Plan identifies volcanoes as one of the hazards adversely impacting the state. Of the approximately 20 volcanoes in the state, only a few are active and pose a threat. Of these, Long Valley Caldera and Lassen Peak (see map that follows) are the closest to Amador County. Populations living near volcanoes are most vulnerable to volcanic eruptions and lava flows, although volcanic ash can travel and affect populations many miles away.

Past Occurrences

The HMPC was unable to find any evidence of volcanic activity within Amador County.

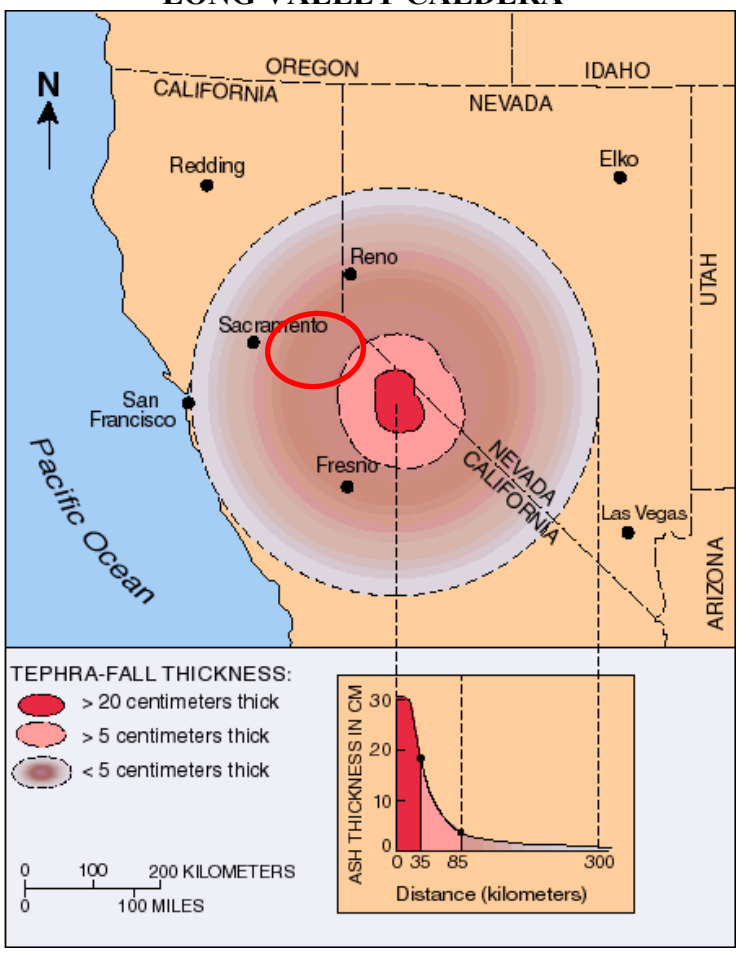
Likelihood of Future Occurrences

Highly Unlikely: Based on available data and the location of the County relative to potentially active volcanoes, it is highly unlikely that volcanic activity of sufficient magnitude to adversely impact the County will occur. The USGS map that follows illustrates areas subject to potential volcanic hazards from future eruptions in California. The Long Valley Caldera is the closest volcano with the potential to impact Amador County, but impacts would likely be limited to ash fall as shown in the second map that follows.



(Source: http://vulcan.wr.usgs.gov/Volcanoes/California/Hazards/Bulletin1847/map_calif_hazards_potential.html)

VOLCANIC HAZARDS ASH DISPERSION MAP
LONG VALLEY CALDERA



The map above illustrates volcanic hazards based on activity in the last 15,000 years. Areas in blue or purple show regions at greater or lesser risk of local volcanic activity, including lava flows, ashfall, lahars (volcanic mudflows), and debris avalanches. Areas in pink show regions at risk of receiving five or more centimeters of ashfall from large or very large explosive eruptions, originating at the volcanic centers. An eruption from Long Valley has the potential to adversely impact Amador County with ashfall less than 5 centimeters thick.

Multi-Hazard Mitigation Plan
4.2 Vulnerability Assessment

As the second part of the Risk Assessment process, the HMPC conducted a Vulnerability Assessment to describe the impact that each hazard identified in the preceding section would have upon the Amador County Planning Area. The vulnerability assessment was conducted, based on the best available data and significance of the hazard. This assessment is an attempt to quantify assets at risk, by jurisdiction where possible, to further define populations, buildings, and infrastructure at risk to natural hazards. The vulnerability assessment for this Countywide Multi-Hazard Mitigation Plan followed the methodology described in the FEMA publication 386-2 *"Understanding Your Risks – Identifying Hazards and Estimating Losses"* (FEMA, 2002) and addressed steps 3 and 4, where data permits, of the following four-step process:

(1) Identify hazards

(2) Profile hazard events

(3) **Inventory assets and**

(4) **Estimate losses.**

Data to support the vulnerability assessment was collected and compiled from the following sources:

(1) County GIS data (hazards, base layers, and assessor's data);

(2) Statewide GIS datasets compiled by the CAL-OES to support mitigation planning;

(3) FEMA's HAZUS-MH MR 1 GIS-based inventory data (January 2005)

(4) Written descriptions of inventory and risks provided by participating jurisdictions;

(5) Existing plans and studies; and

(6) Personal interviews with planning team members and County staff.

The initial scope of the vulnerability assessment was to describe the risks to the county as a whole. Data from each jurisdiction was also evaluated and is integrated here, and noted where the risk differs for a particular jurisdiction across the planning area.

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

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

An estimate of the vulnerability of the Amador County Planning Area to each identified hazard, in addition to the estimate of risk or likelihood of future occurrence, is provided in each of the following hazard-specific sections

The DMA regulations require that the HMPC evaluate the risks associated with each of the hazards identified through the planning process. The hazards identified in Section 4.1 are:

- Avalanches
- Agricultural Hazards
- Dam Failure
- Drought
- Earthquakes
- Floods
- Landslides/Mudslides
- Natural Health Hazards
    - Rabies
    - West Nile Virus
- Severe Weather
    - Extreme Temperatures
    - Heavy Rains/Thunderstorms/Wind/Hail/Lightning

    - Snow
    - Tornadoes
- Soil Hazards
    - Erosion
    - Land Subsidence
- Wildfires
- Volcanoes

The HMPC has determined that the risk of the following hazards occurring within the Amador County Planning Area is minimal or non-existent (i.e., cause minimal or no damages), as described in Section 4.1 and are no longer addressed in this plan:

- Fog

TOTAL VULNERABILITY AND VALUES AT RISK

As a starting point for analyzing the Planning Area's vulnerability to identified hazards, the HMPC utilized a variety of data to define a baseline against which all disaster impacts could be compared. If a catastrophic disaster were to occur in the Planning Area, the following information describes significant assets at risk in the County. Data used in this baseline assessment included:

- Total Values at Risk: Assessor Data indicating value of County's building infrastructure inventory
- Critical Facility Inventory
- Cultural and Natural Resource Inventory
- Development Trends

Total Values at Risk

The following data obtained from the Amador County Assessor's office is based on the Roll Values for 2005. The data should 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 until a property transfer occurs. As a result, overall value information is 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, 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. The total 2005 Roll Values for Amador County are provided in the following tables.

CITY OF AMADOR CITY 2005 Roll Values						
Property Type	**Units Improved**	**Totals Improved**	**Units Vacant**	**Totals Vacant**	**Grand Totals**	
					Units	**$$**
Residential	91	$14,561,266	81	$1,313,210	**172**	**$15,874,476**
Commercial	12	$2,347,779	2	$115,858	**14**	**$2,463,637**
Industrial	1	$4,634	1	5,044	**2**	**$9,678**
Agricultural	1	$9,300	4	$214,420	**5**	**$223,720**
Total Value	**105**	**$16,922,979**	**88**	**$1,648,532**	**193**	**$18,571,511**

CITY OF IONE 2005 Roll Values						
Property Type	**Units Improved**	**Totals Improved**	**Units Vacant**	**Totals Vacant**	**Grand Totals**	
					Units	**$$**
Residential	1241	$200,522,386	164	$44,113,723	**1405**	**$244,636,109**
Commercial	58	$15,405,784	4	$146,061	**62**	**$15,551,845**
Industrial	0	$0	0	$0	**0**	**$0**
Agricultural	3	$117,039	4	$16,894,838	**7**	**$17,011,877**
Total Value	**1,302**	**$216,045,209**	**172**	**$61,154,622**	**1474**	**$277,199,831**

CITY OF JACKSON 2005 Roll Values						
Property Type	**Units Improved**	**Totals Improved**	**Units Vacant**	**Totals Vacant**	**Grand Totals**	
					Units	**$$**
Residential	1589	$257,931,702	303	$13,034,048	**1892**	**$270,965,750**
Commercial	212	$126,585,097	48	$3,761,702	**260**	**$130,346,799**
Industrial	3	$4,153,159	6	$1,194,010	**9**	**$5,347,169**
Agricultural	2	$507,811	5	$11,928,490	**7**	**$12,436,301**
Total Value	**1,806**	**$389,177,769**	**362**	**$29,918,250**	**2,168**	**$419,096,019**

CITY OF PLYMOUTH 2005 Roll Values						
Property Type	**Units Improved**	**Totals Improved**	**Units Vacant**	**Totals Vacant**	**Grand Totals**	
					Units	**$$**
Residential	383	$43,144,224	105	$1,971,528	**488**	**$45,115,752**
Commercial	45	$9,421,461	15	$758,523	**60**	**$10,179,984**
Industrial	0	$0	0	$0	**0**	**$0**
Agricultural	5	$2,720,791	0	$0	**5**	**$2,720,791**
Total Value	**433**	**$55,286,476**	**120**	**$2,730,051**	**553**	**$58,016,527**

CITY OF SUTTER CREEK 2005 Roll Values						
Property Type	Units Improved	Totals Improved	Units Vacant	Totals Vacant	Grand Totals	
					Units	$$
Residential	970	$172,990,515	203	$11,111,380	**1173**	**$184,101,895**
Commercial	103	$43,346,894	22	$4,877,631	**125**	**$48,224,525**
Industrial	1	$397,237	0	$0	**1**	**$397,237**
Agricultural	0	$0	1	$1,842,095	**1**	**$1,842,095**
Total Value	**1,074**	**$216,734,646**	**226**	**$17,831,106**	**1,300**	**$234,565,752**

UNINCORPORATED AMADOR COUNTY 2005 Roll Values						
Property Type	Units Improved	Totals Improved	Units Vacant	Totals Vacant	Grand Totals	
					Units	$$
Residential	10,612	$1,889,065,482	4,849	$187,434,532	**15,461**	**$2,076,500,014**
Commercial	287	$118,740,369	80	$13,140,209	**367**	**$131,880,578**
Industrial	37	$25,189,026	35	$6,187,882	**72**	**$31,376,908**
Agricultural	327	$95,731,463	1,493	$184,115,466	**1,820**	**$279,846,929**
Total Value	**11,263**	**$2,128,726,340**	**6,457**	**$390,878,089**	**17,720**	**$2,519,604,429**

Combining the values of all properties within the incorporated and unincorporated portions of the County results in the following total values at risk:

AMADOR COUNTY 2005 Roll Values Total Values at Risk						
Property Type	Units Improved	Totals Improved	Units Vacant	Totals Vacant	Grand Totals	
					Units	$$
Amador City	**105**	**$16,922,979**	**88**	**$1,648,532**	**193**	**$18,571,511**
Ione	**1,302**	**$216,045,209**	**172**	**$61,154,622**	**1,474**	**$277,199,831**
Jackson	**1,806**	**$389,177,769**	**362**	**$29,918,250**	**2,168**	**$419,096,019**
Plymouth	**433**	**$55,286,476**	**120**	**$2,730,051**	**553**	**$58,016,527**
Sutter Creek	**1,074**	**$216,734,646**	**226**	**$17,831,106**	**1,300**	**$234,565,752**
Unincorporated County	**11,263**	**$2,128,726,340**	**6,457**	**$390,878,089**	**17,720**	**$2,519,604,429**
Total Value	**15,983**	**$3,022,893,419**	**7,425**	**$504,160,650**	**23,408**	**$3,527,054,069**

Critical Facility Inventory

Of significant concern with respect to any disaster event is the location of critical facilities within the County. Critical facilities can generally be defined as, those services and facilities essential during a major emergency, including hospitals, law enforcement stations, fire stations, communication control stations, and other facilities of disaster control, response, and

refuge/shelter (e.g., schools) These facilities should remain operational during any major disaster and be designed, located and constructed accordingly.

This definition was refined by delineating three categories of critical facilities based on the definitions utilized within FEMA's HAZUS-MH loss estimation program. These three categories include: Essential Facilities, High Potential Loss Facilities, and Transportation and Lifeline Facilities. These categories are described further below.

Essential Facilities

The loss to these facilities would be devastating when responding to or recovering from a hazard event:

- Hospitals
- Other medical facilities
- Police stations
- Fire station
- Emergency Operations Centers

High Potential Loss Facilities

These types of facilities would have a high loss or impact on the community:

- Power plants
- Dams
- Levees
- Military Installations
- Hazardous Material sites

Transportation and Utility Lifeline Facilities

These types of facilities are also critical to the community:

- Highways, bridges, and tunnels
- Railroads and facilities
- Bus facilities
- Water treatment facilities
- Natural gas facilities and pipelines
- Oil facilities and pipelines
- Communication facilities

According to the HAZUS inventory, for Essential Facilities, there is 1 hospital in the region with a total bed capacity of 66 beds. There are 22 schools, 3 fire stations, and 5 police stations. With respect to HPL facilities, there are 26 dams identified within the region. Of these, 6 of the dams are classified as 'high hazard'. The inventory also includes 4 hazardous material sites. For Transportation and Utility Lifeline facilities, there are seven transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six utility systems that include potable water, wastewater, natural gas, crude and refined oil, electric power, and communications. The total value of the lifeline inventory is over $1,391.00 (millions of dollars). This inventory includes over 200 kilometers of highways, 58 bridges, and 4,623 kilometers of pipes. NOTE: These HAZUS inventories are based on data available at the time the program was run and may not accurately reflect current inventories for Amador County. As such, this information should be used for general planning purposes only.

To supplement the data found within HAZUS, the following inventories were provided by the HMPC:

- Critical facilities data provided by the Amador County Public Works Agency
    - 33 bridges located throughout the County, with a small bridge valued at $2,000,000
    - 409 miles of roads (658.22 km) in the County, valued at $120,000 per road

- "Special Populations" taken from the Amador County OES, HazMat plan, January 2004:
    - 1 Adult Care Center
    - 24 Children Day Care Centers
    - 3 Detention Centers
    - 1 Hospital
    - 5 Residential Care Facilities
    - 13 Schools

Cultural and Natural Resource Inventory

In evaluating the vulnerability of a given area to disaster, it is important to inventory the cultural and natural resources specific to that area. Cultural and natural resources are important to identify pre-disaster for four reasons:

- First, the community may decide that these sites are worthy of a greater degree of protection than currently exists, due to their unique and irreplaceable nature;

- Second, should these resources be 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;

- Third, the rules for repair, reconstruction, restoration, rehabilitation and/or replacement usually differ from the norm; and

- Fourth, natural resources, such as wetlands and riparian habitat, can have beneficial functions that contribute to the reduction of flood levels and damage.

Cultural Resources

To inventory the County's cultural resources, the HMPC, with assistance from the Amador County Archives collected information from the following sources:

- National Register Inventory List: a list of properties in Amador County which have been designated National Historic properties via the National Register maintained by the National Park Service.
- State Historic Landmarks List: a list of historic properties which have been designated California State Historic Landmarks maintained by the California Office of Historic Preservation in conjunction with the California Department of Parks and Recreation.
- Historic American Building Survey List: a list of properties which were included in a survey of historic buildings in the US. This includes historic properties in Amador County documented during this survey as obtained from the Library of Congress website.
- Historic Spots in California: a list of historic settlements and towns in Amador County which are no longer in existence.

It should be noted that these lists may not be complete, as they may not include those currently in the nomination process and not yet listed. And, as defined by the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA), any property over 50 years of age is considered an 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, the property must be evaluated under the guidelines set forth by CEQA and NEPA.

Further, by definition, an historic property not only includes buildings or other types of structures, such as bridges and dams, but also includes prehistoric or Native American Sites, roads, byways, historic landscapes, and many other features. Given the history of the County, these types of historic properties also exist within the County; however, a current inventory associated with these types of properties does not exist.

The **National Register Information System** includes the following sites:

Resource Name	Address	Location	Listed
Amador County Hospital Building	708 Court St.	Jackson	1972-02-23
Butterfield, John A., House	115 Broadway	Jackson	1986-09-11
Chichizola Family Store Complex	1316--1330 Jackson Gate Rd.	Jackson	1992-08-14
DePue, Grace Blair, House and Indian Museum	215 Court St.	Jackson	1982-05-07

Resource Name	Address	Location	Listed
Fiddletown	Off CA 49	Fiddletown	1978-06-07
Five Mile Drive--Sutter Creek Bridge	Five Mile Drive	Ione	1986-04-11
Indian Grinding Rock	Address Restricted	Volcano	1971-05-06
Ione City Centenary Church	150 W. Marlette St.	Ione	1977-05-26
Jackson Downtown Historic District	Roughly along Main St. from 215 Main St. to 14 Broadway	Jackson	2000-04-14
Kennedy Tailing Wheels	Jackson Gate Rd.	Jackson	1981-07-07
Knight's Foundry and Shops	13 Eureka St.	Sutter Creek	1975-07-01
Preston Castle	N of Ione on Preston Ave.	Ione	1975-07-30
Saint Sava Serbian Orthodox Church	724 N. Main	Jackson	1986-03-06
Scully Ranch	Marlette St.	Ione	1978-11-21
St. George Hotel	2 Main St.	Volcano	1984-09-07
Sutter Creek Grammar School	Between Broad and Cole Sts.	Sutter Creek	1976-12-12

The California Office of Historic Preservation identifies the following **State Historical Landmarks** in Amador County:

NO. 28 MAIDEN'S GRAVE - It is said that in 1850 a young girl, Rachel Melton, native of Iowa, was accompanying her parents on a journey west via covered wagon train when she became violently ill. Camp was made and every effort was made to cure her, as she was the joy of the party, but she passed away and was buried on this spot.
Location: On State Hwy 88 (P.M. 61.3), 10.5 mi W of Kirkwood

NO. 29 VOLCANO - The spot was discovered in 1848 by Colonel Stevenson's men, who mined Soldiers Gulch in 1849. By 1853 the flats and gulches swarmed with men who named them picturesquely. Hydraulic operations, begun in 1855, brought thousands of fortune seekers to form a town of 17 hotels, a library, a theater, and courts of quick justice. During the Civil War, Volcano's gold served the Union - Volcano Blues smuggled the cannon 'Old Abe' in by hearse to quell rebels.
Location: Intersection of Main and Consolation Sts, Volcano

NO. 30 LANCHA PLANA - Lancha Plana (Flat Boat) was well settled by 1850 due to the hydraulic mining operations in the extensive gravel beds along the Mokelumne River. The Amador Dispatch newspaper was born here in 1856. Poverty Bar, Camp Opra, Copper Center, and Put's Bar were 'suburbs' of the larger town.
Location: North shore of Camanche Reservoir, 1 mi W of County Line Bridge on Lancha Plana Buena Vista Rd, 6.0 mi S of Buena Vista

NO. 31 DRYTOWN - Founded in 1848, this is the oldest town and first in which gold was discovered in Amador County. Its venerable town hall and other picturesque structures remain. The town was not 'dry,' as the name implies-it once contained 26 saloons.
Location: On State Hwy 49 (P.M. 13. 7), 0.2 mi N of Drytown

NO. 34 PIONEER HALL - The Order of Native Daughters of the Golden West was organized on these premises, the site of the Pioneer Hall, on September 11, 1886.
Location: 113 Main St, Jackson

NO. 35 OLETA (OLD FIDDLETOWN) - Settled by Missourians in 1849, Fiddletown was a trading center for American, Loafer, and French Flats, Lone Hill, and other rich mining camps. Called Fiddletown because residents "were always fiddling," the settlement became Oleta in 1878 but the original name was later restored. Bret Harte added to the community's fame in An Episode of Fiddletown.
Location: South side of street from Dr. Yee's Chinese Herb Shop, Fiddletown

NO. 36 MIDDLE BAR - Site of gold rush town on the Mokelumne River, now inundated by Pardee Reservoir at certain times of the year.
Location: 2.8 mi S of State Hwy 49 (P.M. 2.5) on Middle Bar Rd at Mokelumne River, 4.5 mi S of Jackson

NO. 37 CLINTON - Clinton was the center of a placer mining community during the 1850s and of quartz mining as late as the 1880s. This town once decided Amador County elections as its votes were always counted last.
Location: Intersection of E Clinton and Clinton Rd, 1.0 mi SE of State Hwy 88, 3.2 mi SW of Pine Grove

NO. 38 IRISHTOWN - This was an important stopping place for emigrants on their way to the southern mines. The first white settlers on this spot found it a 'city of wigwams,' and hundreds of mortars in the rocks testify that this was a favorite Indian camping ground.
Location: On State Hwy 88 (P.M. 20.8) at Pine Grove Wieland Rd, 2.2 mi SW of Pine Grove

NO. 39 BUTTE STORE - This is the only structure remaining of Butte City, prosperous mining town of the 1850s. As early as 1854 Xavier Benoist was conducting a store and bakery in this building. Later Ginocchio had a merchandise business here.
Location: On State Hwy 49 (P.M. 1.4), 2.6 mi S of Jackson

NO. 40 KIRKWOOD'S - Resort, stage station, and post office were originally built by Zack Kirkwood in 1864. When Alpine County was formed from Amador County, the division left the barn and milkhouse in Alpine, while the Alpine-El Dorado line went directly through the barroom of the inn.
Location: On State Hwy 88 (P.M. 71.8), Kirkwood

NO. 41 BIG BAR - The Mokelumne River was mined at this point in 1848. Established in 1849, the Whale Boat Ferry operated until the first bridge was built, about 1852.
Location: On State Hwy 49 (P.M. 0.0) at county line, 4.0 mi S of Jackson

NO. 118 JACKSON GATE - Jackson Gate, on the north fork of Jackson Creek, takes its name from a fissure in a reef of rock that crosses the creek. In 1850 about 500 miners worked here and the first mining ditch in the county was dug here - its water sold for $1 per inch.
Location: On N Main St, 1.3 mi NE of Jackson

NO. 322 SUTTER CREEK - This town was named after John A. Sutter, who came to the region in 1846, and was the first to mine the locality in 1848. There was little activity at Sutter Creek until 1851, when quartz gold was discovered. In 1932 the Central Eureka mine, discovered in 1869, had reached the 2,300-foot level. By 1939, it was the best-paying mine at Sutter Creek.
Location: Veteran's Memorial Hall, Main and Badger Sts, Sutter Creek

NO. 470 PLYMOUTH TRADING POST - This building, constructed entirely of brick, was built by Joe Williams in 1857. In 1873 the many small mines of the area were combined to become Plymouth Consolidated, and this building became the new company's office and commissary.
Location: On Main St, between Mill and Mineral Sts, next to Wells Fargo Bank, Plymouth

NO. 506 THE COMMUNITY METHODIST CHURCH OF IONE - The cornerstone was laid in 1862 and the church, constructed of locally fired brick, was completed in 1866. Dedicated as the Ione City Centenary Church and later popularly known as the Cathedral of the Mother Lode, this church was the first to serve the people in the area.
Location: 150 W Marlette, Ione
Listed on the National Register of Historic Places: NPS-77000287

NO. 662 OLD EMIGRANT ROAD - Here the Old Emigrant Road began a long loop around the Silver Lake basin, reaching an elevation of 9,640 feet at one place. This difficult portion of the road was used by thousands of vehicles from 1848 to 1863, when it was superseded by a route approximating the present highway.
Location: On State Hwy 88 (P.M. 63.1) at Mud Lake Rd, 8. 7 mi W of Kirkwood

NO. 715 SITE OF FIRST AMATEUR ASTRONOMICAL OBSERVATORY OF RECORD IN CALIFORNIA - On the knoll behind this marker George Madeira built the first amateur astronomical observatory of record in California. It was there that he discovered the Great Comet of 1861 with a three-inch refractor telescope.
Location: Volcano

NO. 762 D'AGOSTINI WINERY - D'Agostini Winery was started in 1856 by Adam Uhlinger, a Swiss immigrant. The original wine cellar, with walls made from rock quarried from nearby hills, hand-hewn beams, and oak casks, is part of the present winery - some of its original vines are still in production.
Location: On Plymouth-Shenandoah Rd, 72 mi NE of Plymouth

NO. 786 ARGONAUT AND KENNEDY MINES - Argonaut Mine, discovered 1850, and Kennedy Mine, discovered 1856, played dramatic roles in the economic development of California, producing $105,268,760 in gold. Kennedy Mine has a vertical shaft of 5,912 feet, the

deepest in the United States. The Argonaut was the scene of the Mother Lode's most tragic mine disaster-on August 27, 1922, 48 miners were trapped in a fire at the 3,500-foot level - few survived. Both mines closed in 1942.
Location: W roadside rest, State Hwy 49 (P.M. 5.6), 1.6 mi N of Jackson

NO. 788 D. STEWART CO. STORE - This general merchandise store built by Daniel Stewart in 1856 was the first building erected in lone Valley from nearby Muletown brick. Once known as 'Bed-Bug' and 'Freeze Out,' Ione was an important supply center on the main road to the Mother Lode and Southern Mines.
Location: 18 E Main St, lone

NO. 865 SITE OF JACKSON'S PIONEER JEWISH SYNAGOGUE - On September 18, 1857, Congregation B'nai Israel of Jackson dedicated on this site the first synagogue in the Mother Lode. High holy day worship continued until 1869 when the larger Masonic Hall was used to accommodate the congregation. The wooden structure then served as a schoolhouse until 1888. Relocated onto a nearby lot, it became a private dwelling, and was razed in 1948.
Location: SE corner of Church and Main Sts, Jackson

NO. 867 PRESTON CASTLE - The 'Castle,' built in 1890-1894, is the most significant example of Romanesque Revival architecture in the Mother Lode. It was built to house the Preston School of Industry, established by the State Legislature as a progressive action toward rehabilitating, rather than simply imprisoning, juvenile offenders. Doors of the 120-room 'Castle' closed in 1960 after new facilities were completed.
Location: Preston School of Industry, Waterman Rd - plaque located 0.9 miles N of site on State Hwy 104 (P.M. 4.3), 1 mi N of lone
Listed on the National Register of Historic Places: NPS-75000422

NO. 1001 CALIFORNIA NATIVE AMERICAN CEREMONIAL ROUNDHOUSES (THEMATIC), CHAW SE' ROUNDHOUSE - In a village, the roundhouse served as the center of ceremonial and social life. Constructed in 1974, the Chaw se' roundhouse continues this tradition. With its door facing the east, towards the rising sun, four large oaks are the focal point of this sixty-foot-in-diameter structure. Today ceremonial roundhouses are the most significant architectural manifestation of the continuing Mistook spiritual heritage.
Location: Chaw Se Indian Grinding Rock State Historic Park., 14881 Pine Grove/Volcano Rd, Pine Grove

NO. 1007 KNIGHT FOUNDRY - Knight Foundry was established in 1873 to supply heavy equipment and repair facilities to the gold mines and timber industry of the Mother Lode. Samuel N. Knight developed a high speed, cast iron water wheel which was a forerunner of the Pelton Wheel design. Knight Wheels were used in some of the first hydroelectric plants in California, Utah, and Oregon. This site is the last water powered foundry and machine shop in California. A 42-inch Knight Wheel drives the main line shaft, with smaller water motors powering other machines.
Location: 81 Eureka St, Sutter Creek
Listed on the National Register of Historic Places: NPS-75000423

The following sites, by area of Amador County, are included in the Historic American Building Survey List:

Amador City
1. Amador Hotel, Highway 49, Amador City, Amador County, CA
2. Brick House, Highway 49, Amador City, Amador County, CA
3. Commercial Buildings, Highway 49, Amador City, Amador County, CA
4. Imperial Hotel, Highway 49, Amador City, Amador County, CA

Buena Vista
Buena Vista Stone Store, Lancha Plana & Jackson-Stockton Roads, Buena Vista, Amador County, CA

Butte City
Benoist-Ginocchio Store (Walls), Highway 49, Butte City, Amador County, CA

Dry Town
1. Drytown Hall, Drytown, Amador County, CA
2. Masonic Temple, Drytown, Amador County, CA

Fiddletown
St. Charles Hotel, Fiddletown, Amador County, CA

Ione Vicinity
Dry Creek Bridge, Spanning Dry Creek at Cook Road, Ione vicinity, Amador County, CA

Jackson Gate
Chichizola Store, Jackson Gate Road, Jackson Gate, Amador County, CA

Jackson
1. Brick House, Jackson, Amador County, CA
2. Chichizola Store, Jackson Gate Road, Jackson Gate, Amador County, CA
3. Hotel, Marcucci & Broadway, Jackson, Amador County, CA
4. National Hotel, Main & Waxer Streets, Jackson, Amador County, CA
5. Native Daughters of the Golden West Building, Jackson, Amador County, CA
6. Serbian Church, Jackson, Amador County, CA
7. Toll House, Jackson, Amador County, CA
8. Wells Fargo Express Office, Jackson, Amador County, CA

Michigan Bar
Heath's Store, Michigan Bar, Amador County, CA

Oleta
Frame Barn, Oleta, Amador County, CA

Pine Grove
First House, Pine Grove, Amador County, CA

Plymouth
House, Plymouth, Amador County, CA

Round Top
Kirkwood Inn & Round Top Post Office, U.S. Highway 88, Round Top, Amador County, CA

Sutter Creek
Knight Foundry, Sutter Creek, Amador County, CA

Volcano
1. Adams Express Company Building, Main & Consolation Streets, Volcano, Amador County, CA
2. Main Street (Commercial Buildings, Stone Walls), Volcano, Amador County, CA
3. Masonic & I. O. O. F. Building, Main Street, Volcano, Amador County, CA
4. "Old Abe" Cannon, Volcano, Amador County, CA
5. St. George Hotel, Main & National Streets, Volcano, Amador County, CA
6. Stone Store, Main Street, Volcano, Amador County, CA
7. Volcano, General View, Volcano, Amador County, CA
8. Wine Shop, Volcano, Amador County, CA

Historic Spots in California include the following areas from Amador County:

- Kit Carson Emigrant Trail
- Gold Bars of the Mokelumne
- Lancha Plana
- Butte City
- Drytown
- Lower Rancheria
- Volcano
- Cosumnes Mining Camps
- Sutter Creek
- Amador City
- Jackson
- Ione Valley

Natural Resources

For purposes of this plan, natural resources include threatened and endangered species, wetlands, and other natural resources identified by the HMPC.

Threatened and Endangered Species
To further evaluate the County's vulnerability in the event of a disaster, it is important to inventory key natural resources such as threatened and endangered species.

Endangered Species means any species of fish, plant life, or wildlife, which is in danger of extinction throughout all or a significant part of its range and is protected by law.

Threatened Species means any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range and protected by law.

The following is a list of the animals found within California or off the coast of the State that have been classified as Endangered or Threatened by the California Fish and Game Commission (state list) or by the U. S. Secretary of the Interior or the U. S. Secretary of Commerce (federal list).

STATE AND FEDERALLY LISTED ENDANGERED AND THREATENED ANIMALS OF CALIFORNIA July 2005	
Designation	**Totals as of July 2005**
SE = State-listed as Endangered	47
ST = State listed as Threatened	32
FE = Federally listed as Endangered	84
FT = Federally listed as Threatened	39
SCE = State candidate (Endangered)	0
SCT = State Candidate (Threatened)	0
FPE = Federally proposed (Endangered)	1
FPT = Federally proposed (Threatened)	2
FPD = Federally proposed (Delisting)	1
Total number of animals listed	**154**
Total number of candidate/proposed animals for listing	3
Number of animals State listed only	31
Number of animals Federally listed only	69
Number of animals listed under both State & Federal Acts	54

The list on the following page includes plants that have been classified as Endangered or Threatened. The State listing is pursuant to the Native Plant Protection Act of 1977 and the California Endangered Species Act of 1984 of the Fish and Game Code. Federal listing is pursuant with the Federal Endangered Species Act of 1973, as amended.

STATE AND FEDERALLY LISTED ENDANGERED, THREATENED AND RARE PLANTS OF CALIFORNIA July 2005	
Designation	**Totals as of July 2005**
SE = State-listed as Endangered	131
ST = State listed as Threatened	22
SR=State-listed Rare	67
SC State candidate for listing	1
FE = Federally listed as Endangered	138
FT = Federally listed as Threatened	47
FPE = Federally proposed (Endangered)	0
FPT = Federally proposed (Threatened)	0
Listed under both State & Federal Acts	**123**

Wetlands
Wetlands in Amador County are also an important and legally protected resource. Wetland communities play a vital role in groundwater recharge, water quality protection, and provide habitat for dependent plant and wildlife species. A variety of wetlands occur in the County, and activities that affect these wetlands may require special permitting under Section 404 of the Federal Clean Water Act.

Other Natural Resources
The HMPC identified additional assets of value within the County. These assets are managed by the U.S. Forest Service and the Bureau of Land Management (BLM) as described further below.

Eldorado National Forest. This forest service area includes many assets of value to the County as described in the following table:

Eldorado National Forest Acres of Managed Land in Amador County

Category		Acres
Total Acres of FS land in Amador County		74,302
Wilderness		22,506
Wild and Scenic Rivers		786
Wildland Urban Intermix (WUI)		
	Defense Zone	1,802
	Threat Zone	13,199
Owl and Goshawk		
	Home Range Core Area (SO)	16,941

Eldorado National Forest Acres of Managed Land in Amador County

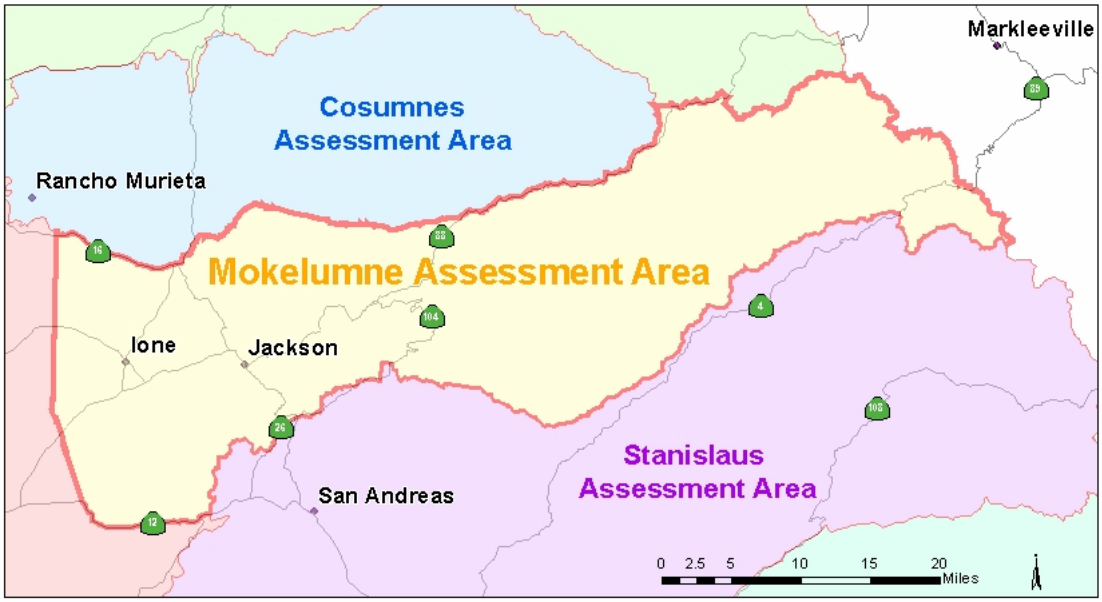
Category	Acres
Owl Protected Activity Center	4,279
Goshawk Protected Activity Center	1,037
Old Forest	44,468
General Forest	6,343
Riparian Conservation Area - Perennial	7,647
Riparian Conservation Area - Seasonal	24,423
Forest Carnivore Den Site Buffers	0
Great Gray Owl Protected Activity Center	0
Southern Sierra Fisher Conservation Area	0
Critical Aquatic Refuge	0

Acres may be overlapping, therefore, double-counting has probably taken place.
Analysis run by Terry Tenley, taken from on-going Fireshed Assessment project.
Information provided by Debra Tatman, Geospatial Services Coord., Eldorado National Forest

Bureau of Land Management. Information obtained from the BLM identified natural inventories specific to the watershed assessment areas of the Mokelumne and Consumnes Rivers. These inventories are detailed below by assessment area.

The Mokelumne Assessment Area

The Mokelumne Assessment Area is illustrated in the figure that follows. A description of the area and plant and animal species of special status is also provided.



Mokelumne River Assessment Area

The Mokelumne River Assessment area is home to many habitats and an abundance of wildlife. The most significant wildlife habitat within the assessment area is the riparian habitat, especially within the river corridors of the three forks of the Mokelumne River. The river corridor represents not only a wide diversity of habitat, but a relatively continuous corridor of habitat.

Other habitat types represented within the watershed include mixed conifer forest, montane hardwood, chaparral, oak woodland, and grassland. Each habitat type is important to different species of wildlife. Some wildlife species will use only one habitat type, whereas other species will use multiple habitat types. Elevation is also important in determining which species may occur. Micro habitats such as cliffs, snags, old trees, ponds, seeps, etc. will also influence wildlife use.

Special Status Plant Species that are know to occur or could potentially occur on BLM-administered land within the watershed are identified in the following table.

Special Status Species of the Mokelumne Assessment Area			
Common Name	**Scientific Name**	**Status**	**Occurrences**
Ione manzanita	*Arctostaphylos myrtifolis*	FT	
Apricum Hill buckwheat	*Eriogonum apricum var. apricum*	FE	
Parry' horkelia	*Horkelia parryi*	BLM-S	
Red Hills soaproot	*Chlorogalum grandiflorum*	BLM-S	
Pleasant Valley mariposa lily	*Calochortus clavatus avius*	BLM-S	Potentially occur within the assessment area
Tuolumne button-celery	*Eryngium pinnatisectum*	BLM-S	Potentially occur within the assessment area

FE – Federal Endangered; FT – Federal Threatened; FSC – Federal Special Concern; BLM-S - BLM Sensitive

Special Status Animal Species that are known to occur, historically occurred, or could potentially occur on BLM-administered land within the watershed are identified in the following table.

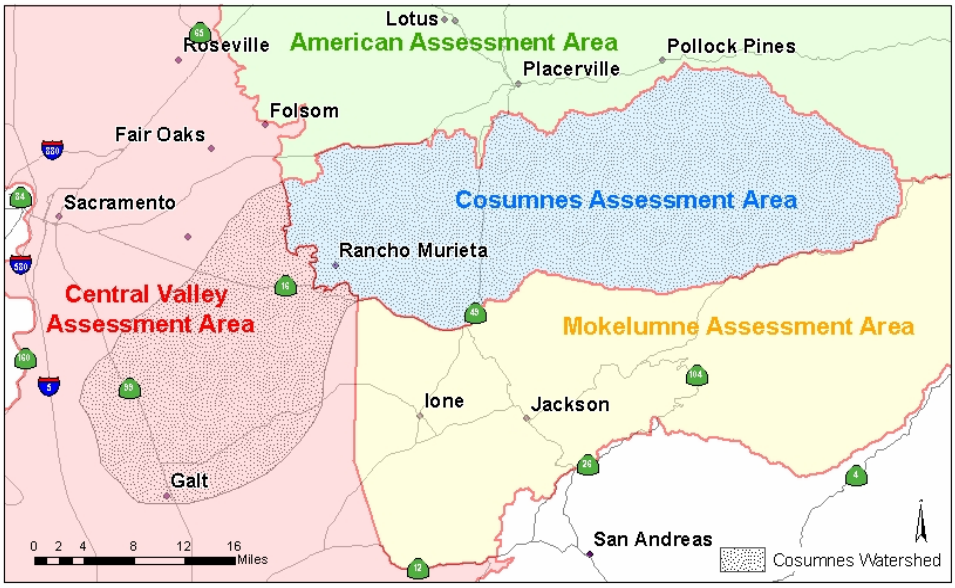
Special Status Species of the Mokelumne Assessment Area			
Common Name	**Scientific Name**	**Status**	**Occurrences**
California spotted owl	*Strix occidentalis occidentalis*	BLM-S	South Fork Mokelumne River near Pine Ridge; Licking Fork near Gold King Mine; South Fork Mokelumne River; Independence Road; Near Victory Dude Ranch; Esperanza Creek
Northern goshawk	*Accipiter gentilis*	FSC	Near Wilseyville
Foothill yellow-legged frog	*Rana boylii*	BLM-S	Wet Gulch; Esperanza Creek; Salamander Creek

Special Status Species of the Mokelumne Assessment Area			
Common Name	**Scientific Name**	**Status**	**Occurrences**
California red-legged frog	*Rana aurora draytonii*	FT	Hunt Gulch near Pardee Reservoir
Valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*	FT	North Fork Mokelumne River near Tiger Reservoir

FE – Federal Endangered; FT – Federal Threatened; FSC – Federal Special Concern; BLM-S - BLM Sensitive

The Consumnes Assessment Area

The Consumnes Assessment Area is illustrated in the figure that follows. A description of the area and plant and animal species of special status is also provided.



Cosumnes River Assessment Area:

The Cosumnes River, including all of its forks and major tributaries, is recognized nationwide for its unique values. Although it is not abounding in special status species, it maintains its natural hydrological processes. In turn, the rich biodiversity found in this assessment area is unlike any other. The Cosumnes River Assessment Area serves as a key wintering area and wildlife corridor between the Sierra Nevada Mountains and the Central Valley for migratory species. For other species, this assessment area provides optimal habitat for foraging, resting, and breeding. Although there are few special status species in the area, there are hundreds of species are known to occur within this assessment area. Some of these species, mostly aquatic, are endemic to the area. Habitat types in the area include, annual grasslands, oak woodlands, Blue oak woodlands, chaparral, coniferous forests, and riparian areas.

Special Status Plant Species that are know to occur or could potentially occur within the assessment area are identified in the following table.

Special Status Species with the *Potential to Occur* within the Cosumnes River Assessment Area			
Common Name	Scientific Name	Status	Occurrences
Parry's horkelia	*Horkelia parryi*	BLM-S	Potentially occurs in the assessment area
Pleasant Valley Mariposa lily	*Calochortus clavatus avius*	BLM-S	Potentially occurs in the assessment area
Jepson's Onion	*Allium jepsonii*	BLM-S	Potentially occurs in the assessment area
Nissenan manzanita	*Arctostaphylos nissenana*	BLM-S	Potentially occurs in the assessment area
Layne's butterweed	*Senecio layneae*	FT	Potentially occurs in the assessment area
Pale big-eared bat	*Corynorhinus (=Plecotus) townsendii*	FSC	Potentially occurs in the assessment area

FE – Federal Endangered; FT – Federal Threatened; FP – Federal Proposed; FSC – Federal Special Concern; BLM-S - BLM Sensitive; SE - State Endangered

Special Status Animal Species that are known to occur or could potentially occur within the assessment area are identified in the following table.

Special Status Species *Known to Occur* within the Cosumnes River Assessment Area			
Common Name	Scientific Name	Status	Occurrences
California spotted owl	*Strix occidentalis occidentalis*	BLM-S	Near Round Mountain, between Middle and South Forks of Cosumnes River
Foothill yellow-legged frog	*Rana boylii*	BLM-S	Middle Fork Cosumnes River near Melsons Corner
Red Hills soaproot	*Chlorogalum grandiflorum*	BLM-S	Indian Diggings, between Middle and South Forks of the Cosumnes River

FE – Federal Endangered; FT – Federal Threatened; FP – Federal Proposed; FSC – Federal Special Concern; BLM-S - BLM Sensitive; SE - State Endangered

Development Trends

According to the 2004-2009 Housing Element for Amador County adopted by the County Board of Supervisors in May of 2005, the following information taken from this report illustrates recent and projected growth and development trends in the County:

Current Status (2000 Census)

- 20,503 individuals, or 58.4% of Amador County's Residents live in the unincorporated county
- 14,597 individuals, or 41.6%, live within the county's incorporated cities

Growth Rate

- The county should expect a growth rate of approximately 2% through 2009 with a projected increase in the population of the unincorporated county to 23,953. The County

is experiencing a higher range of growth due to the close proximity to Sacramento and the increasing demands of Bay Area residents wanting to move to a more rural setting. Also, neighboring counties have experienced significant growth over the past 10 years. It is expected that the growth rate in Amador County will increase significantly due to these pressures.

- Statistics illustrate that population growth for Amador County is occurring primarily in its incorporated cities in particular, in the cities of Plymouth and Sutter Creek. The following three tables taken from the Housing Element illustrate the past and projected growth rate for Amador County.

Population Change 1990-2000
Amador County

Jurisdiction	1990 Population	2000 Population	Numeric Change	Percent Change	Annual Percent Change
Amador City	196	196	0	0.0	0.0
Ione	6,516	7,129	613	9.4	0.9
Jackson	3,545	3,989	444	12.5	1.3
Plymouth	811	980	169	20.8	2.1
Sutter Creek	1,835	2,303	468	25.5	2.6
Unincorporated	17,136	20,503	3,367	19.6	2.0
Amador County Total	**30,039**	**35,100**	**5061**	**16.8**	**1.7**

Population Change 2002-2003
Amador County

Jurisdiction	2002 Population	2003 Population	Numeric Change	Annual Percent Change
Amador City	210	210	0	0.0
Ione	7,450	7,450	0	0.0
Jackson	4,020	4,060	40	1.0
Plymouth	1,030	1,070	40	3.9
Sutter Creek	2,370	2,440	70	3.0
Unincorporated	20,970	21,270	300	1.4
Amador County Total	**36,050**	**36,500**	**450**	**1.2**

Projected Population Growth Amador County: 2005 – 2020				
Year	Incorporated + Unincorporated County/a/	Unincorporated County Low Projection (1.7%)	Unincorporated County Moderate Projection (2.0%)	Unincorporated County High Projection (2.9%)
2004	--	21,632	**21,696**	21,887
2005	35,400	22,000	**22,129**	22,522
2006		22,374	**22,572**	23,175
2007		22,754	**23,023**	23,847
2008		23,143	**23,483**	24,539
2009	37,235	23,536	**23,953**	25,251
2010	37,600	23,936	**24,432**	25,983
2015	40,300	25,971	**26,875**	29,751
2020	41,300	28,178	**29,563**	34,065

/a/ California Department of Finance Projections

Development Trends

- Amador County anticipates that 946 residential units will be necessary to fill the County's housing needs for the planning period of 2004 to 2009. 391 of these units are needed to house low and very low income households (See table that follows).

Projected Housing Needs By Income Group Amador County 2001-2009 **Median Family Income (Family of 4): $51,226** **Median Household Income: $42,280**	
Income Group (Gross Annual Wage-Family of 4)	**New Units Needed By 2009/a/**
Very low ($28,000-$44,799)	231
Low ($44,800-$55,999)	160
Moderate ($56,000 – $67,199)	177
Above Moderate ($67,200 and above)	378
Total	**946**

/a/a Draft Regional Housing Needs Assessment May, 2003; Central Sierra Planning Council

- **Housing Costs:** Housing costs continue to increase without a corresponding increase in the county's median wage. The average sale price of a two bedroom home in Amador County in 2002 was $164,878. The median income for a family of three will purchase a home of approximately $126,000, leaving an affordability gap of approximately $38,100.

- **Housing Stock:** 1.5% of the county's housing units are classified as substantially deteriorated or dilapidated. The median year of construction for a structure in Amador County is 1977. Amador City has the oldest median for its structures—the median year of construction there is 1939.

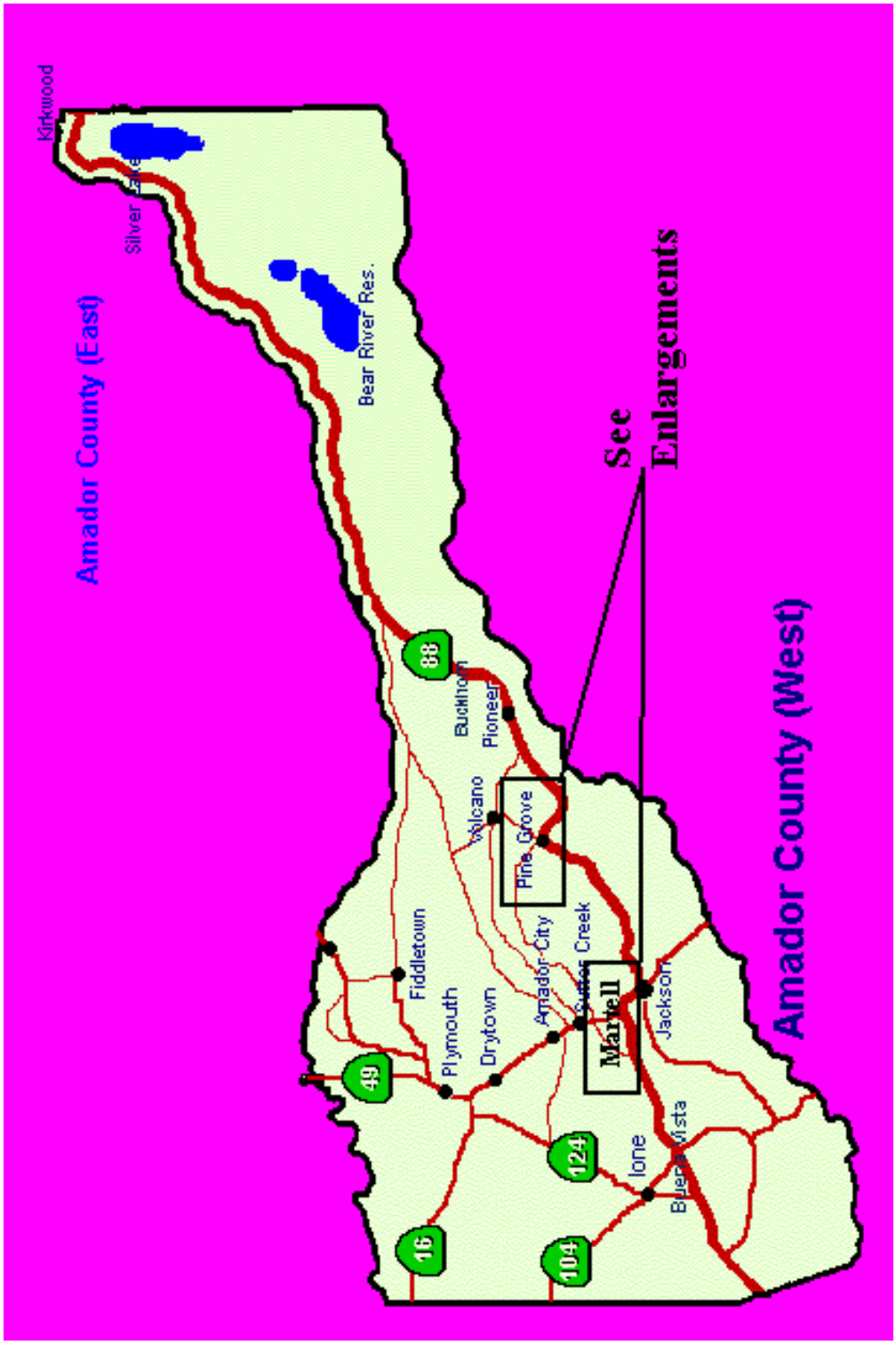
- **Land Availability:** Existing vacant and underdeveloped land zoned for multifamily use in the unincorporated area of the county potentially could support 1,117 residential units at the existing county density allowance of 18 units per acre. The housing element proposes an increase in the 18 unit/acre density (to 25 units per acre) which would result in a corresponding increase in the potential number of housing units that the county could support.

- **Constraints:** The removal of land use constraints (e.g., requirements for special permits for various uses) is one of the most economical and efficient means by which county government can assist in the development of affordable housing. This element places an emphasis on removing governmental constraints as necessary to encourage the construction of affordable housing throughout the county. Many constraints are outside of the direct control of county government. The expansion of water and wastewater

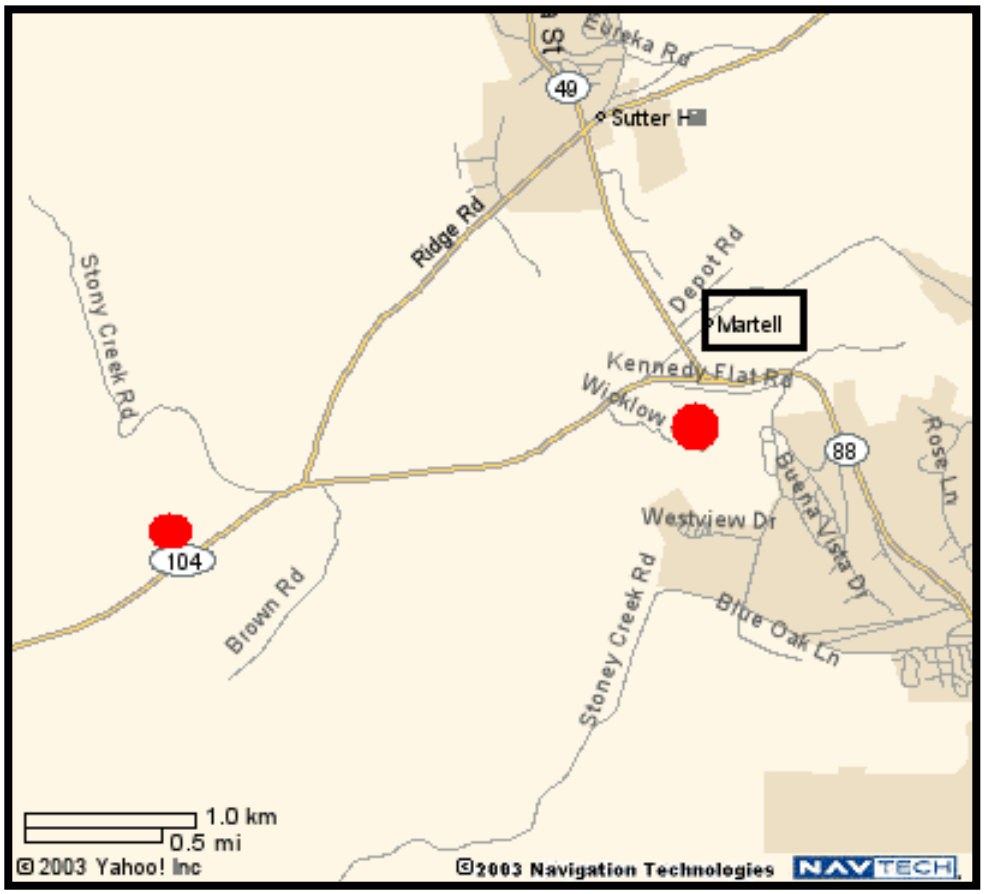
facilities sufficient to serve development continues to be one of the primary deterrents to the development of affordable housing.

- **New Development Areas:** An inventory and assessment of high density parcels available for single and multifamily residential development is included in the table that follows. The two primary areas targeted for high density development, Martell and Pine Grove, are also depicted in the three maps that follow.

Amador County Inventory of High Density Parcels Available for Residential Development						
Parcel Number(s)	**General Plan**	**Zoning**	**Acreage**	**Density Standard (Maximum Density)**	**Discussion of Development Potential & Constraints**	**Practical (Adjusted) Development Density/a/**
011-027-013, (Martell Area)	SP	R3	5.1	18 du/acre	Water/Sewer – See Note /c/ Roads – not currently on site, will require expense to construct Topography – ridge top (should not present obstacle to development) Other - none	**91**
011-027-015 (Martell Area)	SP	R3	5.19	18 du/acre		**93**
011-027-016 (Martell Area)	SP	R3	5.32	18 du/acre		**95**
011-027-017 (Martell Area)	SP	R3	5.04	18 du/acre		**90**
011-027-018 (Martell Area)	SP	R3	5.6	18 du/acre		**100**
044-100-027 (portion) Martell Area	SP-R/b/	R3	31	18-25/acre (558-775)	Water/Sewer – See Note /d/ Roads – requires expenditure to construct, but otherwise unlikely to be an impediment Topography – Relatively gentle Other: Owner is investigating annexation to the City of Jackson; portion of the site is within Airport Land Use Noise Contours, but unlikely to affect ability to construct	**558**
038-170-018 (portion) Pine Grove Area	RL	R3	1	7/acre 4 units already existing	Water/Sewer – See Note /e/ Roads – On site Topography – On site Other - None	**3**
030-080-118 Pine Grove Area	SP	PD-R3	5.39	18 du/acre (97 du/acre) (20 units existing; 4 additional approved)	Water/Sewer—See Note /f/ Roads – Existing Topography – relatively flat Other – None.	**73**
					TOTAL	**1,103 units**

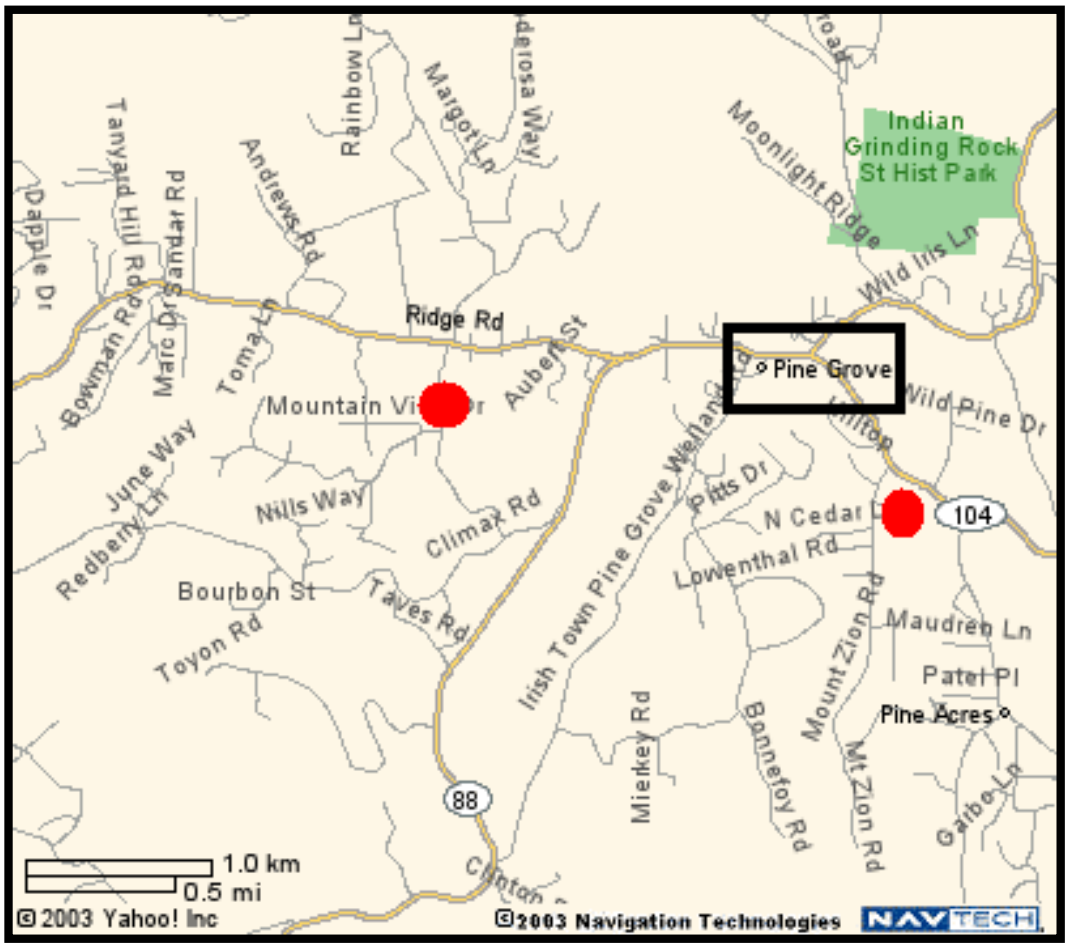

Amador County (East)
Amador County (West)
Kirkwood
Silver Lake
Bear River Res.
See
Enlargements
Pine Grove
Volcano
Pioneer
Buckhorn
Fiddletown
Plymouth
Drytown
Amador City
Sutter Creek
Martell
Jackson
Ione
Buena Vista
88
49
16
104
124

Martel Area



Red=Vacant, Underdeveloped

Pine Grove Area



Red=Vacant, Underdeveloped

- **Infill Areas:** Parcels identified in the following tables and maps depict vacant, single family residential parcels targeted as infill areas. All necessary roads, public water and public sewer should be assumed to be present. On larger acreage parcels, individual wells and septic systems are required and should be assumed to be absent.

Major Residential Subdivisions (Named and Unnamed) with 6+ Vacant Parcels in Unincorporated Amador County – 2003					
Subdivision or Unincorporated Community	**Assessor Book - Page**	**Community Nearby**	**Ave Lot Size or Range**	**# Lots Vacant**	**Anticipated Affordability Income Classification**
1. Lake Camanche Village #1	**3**-01 to 09, 1,12, 13, 17-22, 25-41	Camanche Village	167@ <1.0 ac (ave. 0.5) 117@ 1.0 ac. +	284	Low to Moderate (167) Moderate (117)
2. Lake Camanche Village #2	**3**-13, 14, 15,16,23, 24, 29		21@ 1.9-3.1acs 3@ 4+ acs	24	Moderate to Above Moderate
3. Lake Camanche Village 3A	**3**-49 to 62		35@ 0.5-0.7 ac. 78@ 1.0-3.4 ac. 2@ 6.8-7.8 ac.	115	Low to Moderate (35) Moderate to Above Moderate (80)
4. Lake Camanche Village 3B	**3**-78 to 82		152@0.5-0.9 129@ 1.0-2.0	281	Low to Moderate (152) Moderate to Above Moderate (129)
5. Lake Camanche Village #4	**3**-63, 64, 65		17@2.4-2.9 ac 2 4+ acres	19	Moderate to Above Moderate
6. Lake Camanche Village #6	**3**-66 to 73, 76, 77		0.25-0.7 ac. (1@ .94)	111	Low to Moderate
7. The Oaks Mobile Community		Near Buena Vista	MHP Lots	9	Low to Moderate
8. Pardee/Stony Creek Rd. (Unnamed)	**12**-29	North of Lake Pardee	3.0-6.6 acres	6	Moderate to Above Moderate
9. Adjacent (North) of Willow Creek Ranch Estates		W. of Rancho Murrieta along Hwy. 16	4 ac - 9.95 ac	7	Moderate to Above Moderate
10. Willow Creek Ranch Estates 1-3	**11**-21, 22,23,24 **8**-12, 39 40, 41		5-7 acres	30	Moderate to Above Moderate
11. Mt. Echo Ranch (and adjacent)		North of Ione along Hwy. 124	2.8 – 6 acres	12	Moderate to Above Moderate
12. Drytown (Includes Viewpoint Subdivision)	**8**-17, 18,19,20, 37,38, 44, 45	Drytown (North of Amador City)	14@< 0.5 ac 6@<0.5-1 ac 6@ 1.1-3.9 ac 9@4 ac-9.6ac	35	Low to Moderate (20) Moderate to Above Moderate (15)
13. River Pines (1-4) & Pine Lodge (Units 1-2) Subdivisions	**14**-04, 05,06, 07, 08, 09	North of Fiddletown near the Amador – El Dorado County border	0.05 -0.2 ac	99	Low (Limited Moderate)
14. Fiddletown Townsite	**14**-24, 25, 26	Fiddletown	0.1-5.04 ac.	21	All

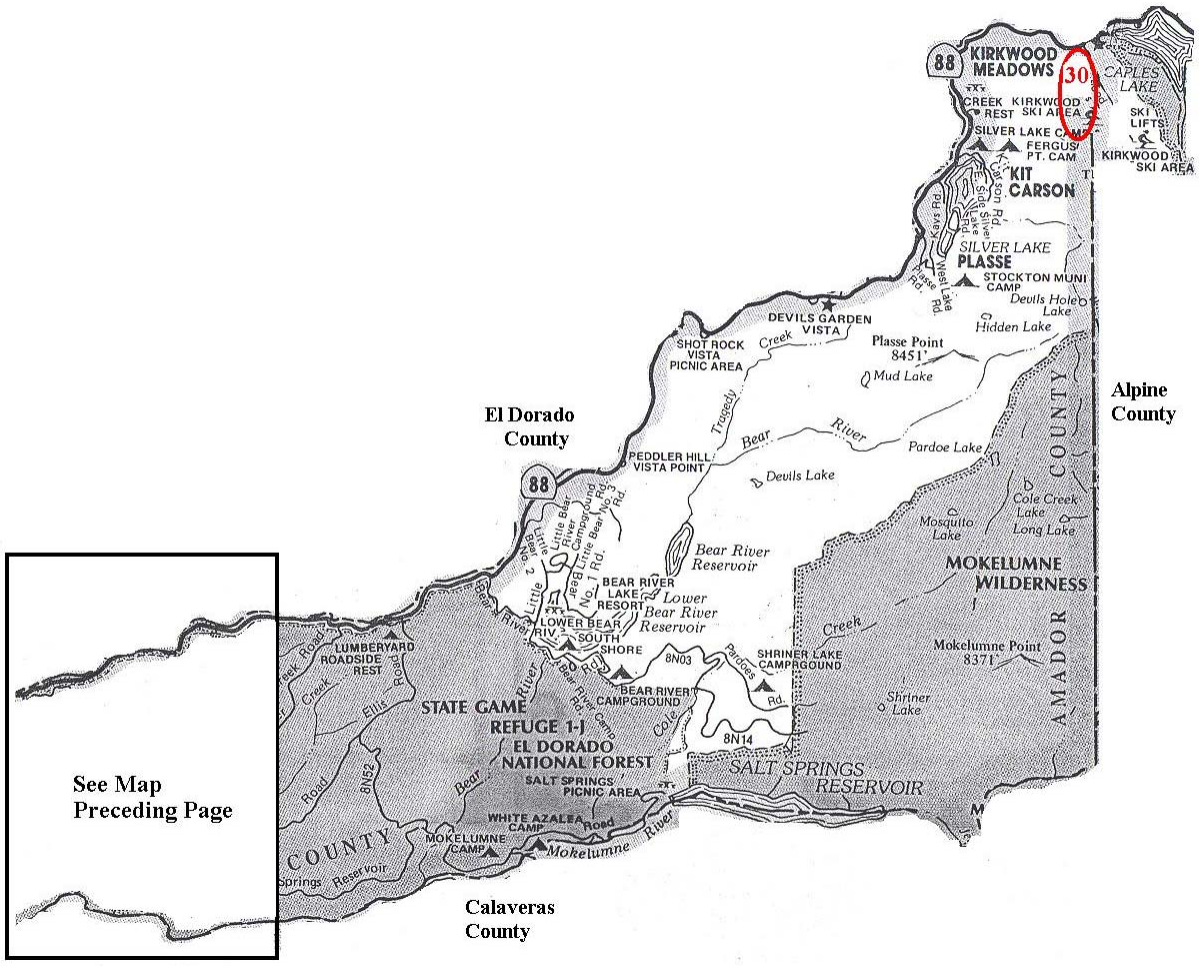
Major Residential Subdivisions (Named and Unnamed) with 6+ Vacant Parcels in Unincorporated Amador County – 2003					
Subdivision or Unincorporated Community	**Assessor Book - Page**	**Community Nearby**	**Ave Lot Size or Range**	**# Lots Vacant**	**Anticipated Affordability Income Classification**
15. Rolling Oaks Ranchettes, Oak Hill Subdivision	**14**-27 **15**-27, 28,29, 50, 52	South of Fiddletown	2.6-10 acres	35	Moderate to Above Moderate
16. Ridge Top/Nina Rd. (Unnamed)	**15**-06		10 ac	8	Moderate to Above Moderate
17. Rancho Del Monte (and adjacent)	**21**-05, 33, 38	East of Fiddletown near Amador – El Dorado County border	6 @ < 5 acres 25 @ 5.1-10 ac	31	Moderate to Above Moderate
18. Surrey Junction	**15**-51, 53	West of Pine Grove	5 acres	22	Moderate to Above Moderate
19. Sutter Highlands #1	**15**-23, 30, 31, 33-40, 42, 44	Sutter Highlands (east of Sutter Creek)	1.4-6.43 acres	32	Moderate to Above Moderate (Limited Low)
20. Sutter Highlands #2			1.1-9.75 acres	91	
21. NE and East of Sutter Highlands (Unnamed)	**15**-17, 19, 20, 26		0.5 – 10.0	30	
22. Burke Ranch Subdivision Units 1-4	**8**-42, 43	East of Plymouth	5.1 acres	6	Moderate to Above Moderate
23. Amador Pines	**23**-03, 04, 05, 06, 28 to 39, **32**-03, 06, 08, 09, 11 to 31, 36 to 42	Shake Ridge Road below Junction with Hwy. 88	0.9-7.9 ac	336	Moderate to Above Moderate
24. Shake Ridge Rd/Hummingbird (Unnamed)	**15**-45, 46	NE of Sutter Highlands	1-8.3	14	Moderate to Above Moderate
25. Cedar Pines Estates	**21**-08, 09, 10,	East of Fiddletown	3.9-7.9	21	Moderate to Above Moderate
26. Allan Rd - Shake Ridge (Unnamed) (Allen subdivision)	**44**-42, 43	North of Volcano	13 @ < 1 acre 12 @1.0-2.6 ac 2@4.8-9.6 ac	27	Moderate
27. Gold Creek Trail/Shake Ridge	**21**-32	North Volcano	14@ 1.0-1.7 ac. 4@ 5.0 ac.	18	Moderate to Above Moderate
28. Brockman Mill & Ponderosa	**21**-28	East of Fiddletown	2 @ 1.5-1.9 2 @ 3.0-4.2 ac. 5@5.3 ac.	9	Moderate to Above Moderate

Major Residential Subdivisions (Named and Unnamed) with 6+ Vacant Parcels in Unincorporated Amador County – 2003					
Subdivision or Unincorporated Community	**Assessor Book - Page**	**Community Nearby**	**Ave Lot Size or Range**	**# Lots Vacant**	**Anticipated Affordability Income Classification**
29. Fiddletown Rd & Bootstrap	**21**-30	North of Volcano	7@ 0.2 – 0.5 ac. 7@ -1.0-1.9 ac. 13@2.2-8.0 ac.	27	Moderate to Above Moderate
30. Kirkwood Meadows Units 1, 2	**26**-14 to 20	Kirkwood	Condominium to 0.5 ac.	44	Above Moderate
31. Mother Lode & Red Corral Estates	**30**-22 to 25, 29	SW of Pioneer (Near Millers)	1.0 – 7.0 acres	14	Moderate to Above Moderate
32. Pioneer Glenn	**23**-13, 14	NE of Pioneer	1.2 – 4.5 acres	6	Moderate to Above Moderate
33. Sherwood Forest	**23**-61, 67	S. of Lockwood (S. of Fiddletown/Shake Ridge Rd. intersection)	2.6 – 6.7 acres	18	Moderate to Above Moderate
34. River View Tract 1-4	**31**-12, 13, 15, 21, 22, 23, 33	S. of Pioneer on Hwy. 26	0.59-7.66	18	Moderate
35. Rabb Park	**33**-02,7,11, 44,45,46,47, 71,73,75,76	E of Pioneer on Hwy. 88	0.3 to 1.2 ac	39	Moderate (Limited Low)
36. Hei View Estates	**30**-72 **31**-25	NW of Pioneer	5 @ 0.2 - 0.9 2@ 1.76 - 2.15	7	Moderate (Limited Low)
37. Mace Meadows	**23**-40, 41, 45, 46, 47, 48, 52, 53, 54, 55, 56, 57 **33**-20, 21,22,23, 37, 38, 39, 40, 41, 48, 52	E of Pioneer on Hwy. 88	Majority < 1.0 acre	127	Moderate to Above Moderate (Limited Low)
38. Buckhorn Ridge	**23**-15, 16, 19 **33**-14	NE of Pioneer on Hwy. 88	0.6-1.7 ac	5	Moderate
39. Silver Lake Pines	**33**-54, 55, 58 to 70	E of Pioneer on Hwy. 88	0.4 ave	84	Moderate (Limited Low)
40. Meadow Pines Estates	**31**-32, 34	N of Pioneer	0.2 – 0.5	12	Moderate (Limited Low)
41. Fairway Pines	**33**-77, 78, 79, 81	E of Pioneer	0.27 – 0.7	70	Moderate (Limited Low)

Major Residential Subdivisions (Named and Unnamed) with 6+ Vacant Parcels in Unincorporated Amador County – 2003					
Subdivision or Unincorporated Community	**Assessor Book - Page**	**Community Nearby**	**Ave Lot Size or Range**	**# Lots Vacant**	**Anticipated Affordability Income Classification**
42. Cedar Heights (Unnamed)	**31**-27	E of Pioneer (on Hwy. 88)	0.5 – 1.2 acres	6	Moderate (Limited Low)
43. Sierra Highlands	**33**-24, 25, 32, 33, 34, 35, 36, 42, 43, 49, 50, 51, 57	SE of Pioneer	0.4-0.8 ac.	38	Moderate (Limited Low)
44. Sierra Vista Pines, Panorama Estates, Cal-Am Estates	**23**-58, 59, 66	E of Fiddletown and Shake Ridge Road intersection	12@ 1-2 acres 16 @2.5 -5 acres	28	Moderate to Above Moderate
45. Ponderosa Hills	**36**-37, 39	South of Clinton	5.0 acres ave.	7	Moderate to Above Moderate
46. Ponderosa Heights, Pine Acres & adjacent	**38**-05, 06, 07, 10, 11, 12, 13, 14, 17, 18, 20	SE Pine Grove on Hwy. 88	41@ 0.95 – 1.8 acs 6@ 12.0-9.2 acs	47	Moderate (Limited Low)
47. Red Berry Hill	**38**-02, 03, 04	Pine Grove	1.0 – 5.0 ave.	18	Moderate
48. Jackson Pines Estates	**36**-41, 42, 43	Clinton	0.7 – 3.2 ac.	27	Moderate
49. Tiger Creek Estates	**33**-29, 74	E of Pioneer	12@ 0.6 – 1.1 ac 4 @ 3.0+ acres	16	Moderate (Limited Low)
50. Pioneer Hills and Adjacent (South)	**31**-29, 30, 31	Pioneer	8 @ 0.4 – 0.8 ac. 4 @ 4.0+ acres	12	Moderate
51. Foster Ranch Estates/Oakview	**31**-36	N of Pioneer	0.77 – 3.6 ac.	8	Moderate to Above Moderate (Limited Low)
52. Roden Tract	**30**-40	E of Pine Grove	1.0 – 2.2	7	Moderate
53. Butte Mountain/Clinton (Unnamed)	**44**-20, 22, 23, 24, 25, 26, 27, 28	East of Jackson (Butte Mt. Road)	1.0 – 7.0 acres	39	Moderate to Above Moderate
54. Pine Acres Ranchettes	**30**-45, 46, 47	NW of Millers (W of Pioneer)	5.0 acres	11	Moderate to Above Moderate
55. Carson Pass Pines	**23**-65, 68	Shake Ridge Rd (E of Fiddletown and Shake Ridge intersection)	20 @ 1.0 2 @ 2-4 acres	22	Moderate to Above Moderate (Limited Low)
56. Volcano (townsite)	**29**-01, 02, 03, 04, 05, 06	Volcano	0.15 - 9.6 (Majority 0.1-0.4 ac	35	All

Major Residential Subdivisions (Named and Unnamed) with 6+ Vacant Parcels in Unincorporated Amador County – 2003					
Subdivision or Unincorporated Community	**Assessor Book - Page**	**Community Nearby**	**Ave Lot Size or Range**	**# Lots Vacant**	**Anticipated Affordability Income Classification**
	30 -		ave.)		
57. Warner Tract West/East	**30**-21	E of Pine Grove	1.0 acre average	10	Moderate (Limited Low)
58. Tanyard Hill (Unnamed)	**30**-09	N of Pine Grove	0.99 – 9.3 ac	7	Moderate
59. Meadowood Drive (Unnamed)	**36**-25, 29, 30, 32	Near Clinton	1.0 – 9.3 acs	31	Moderate to Above Moderate
60. Gayla Manor	**38**-62	E of Pine Grove on Hwy. 88	0.9 – 1.9 ac.	16	Moderate
Total – Vacant Single Family Residential Parcels In Major Subdivisions (Unincorporated)				**2589**	

Amador County Subdivisions
See Map Next Page
El Dorado County
Calaveras County
Rancho Murietta
Sacramento County
San Joaquin County
AMADOR COUNTY
SUTTER CREEK
AMADOR CITY
DRYTOWN
PLYMOUTH
IONE
JACKSON
VOLCANO
FIDDLETOWN
RIVER PINES
ENTERPRISE
SUTTER HIGH LANDS
CAMANCHE VILLAGE
CAMANCHE NORTH SHORE
CAMANCHE SOUTH SHORE
BUENA VISTA
CARBONDALE
FOREST HOME
MARTELL
PINE ACRES
CLINTON
RICHARDSON
ICOOKS STATION
HAMS STATION
Hwy. 26
1-6
9-10
11
12
13
14
15
16
19-21
22
23, 44
25
28
33
34
35, 39
37
41
43
53
55



The following map also taken from the Amador County Housing Element illustrates agricultural land in Amador County.

STATE OF CALIFORNIA
Arnold Schwarzenegger, Governor

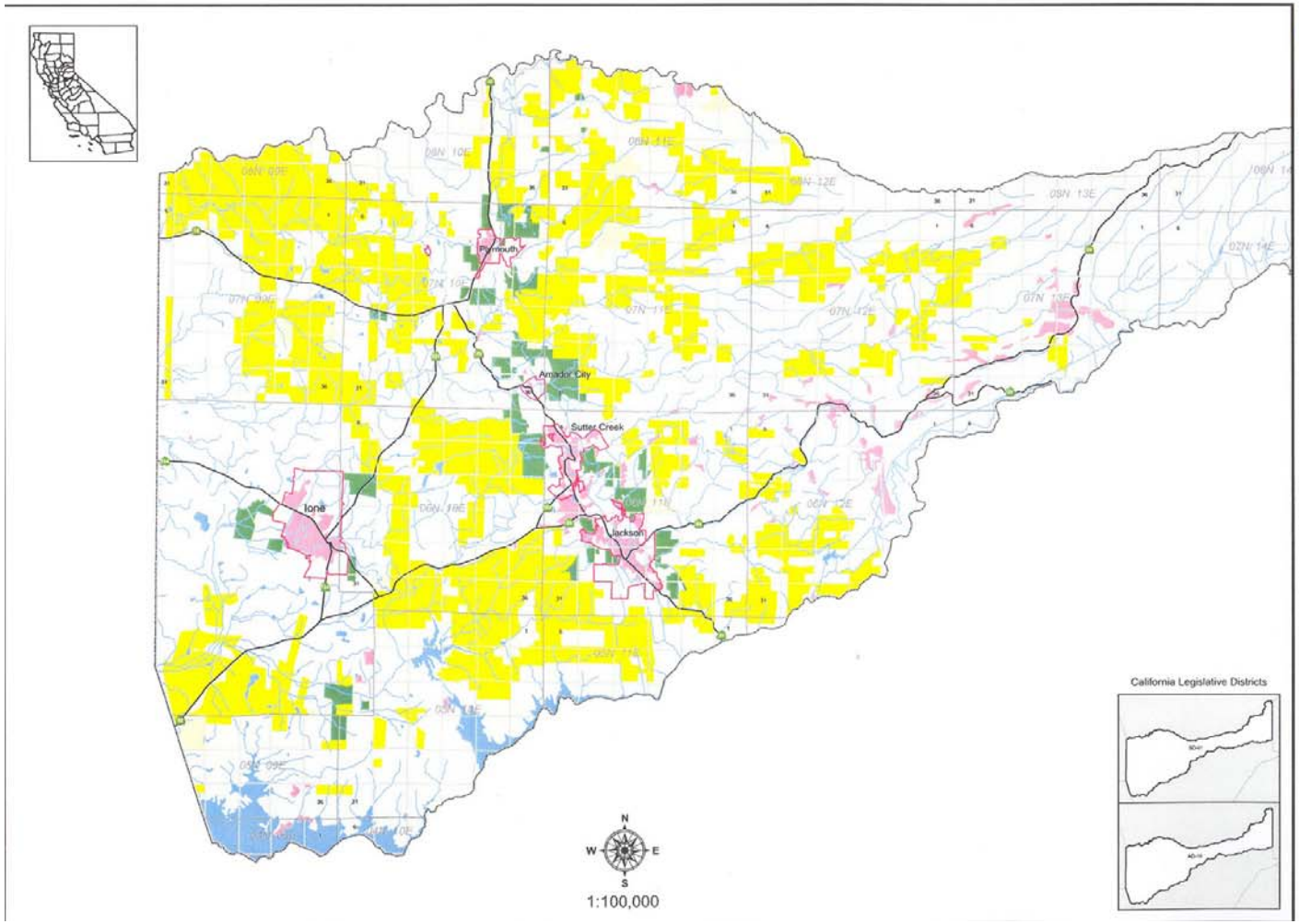
THE RESOURCES AGENCY
Michael Chrisman, Secretary for Resources

DEPARTMENT OF CONSERVATION
Darryl Young, Director

Amador County Williamson Act Lands 2003

Land Enrolled in Williamson Act and Farmland Security Zone Contracts as of 01-01-2003

Department of Conservation
Division of Land Resource Protection



Williamson Act - Prime Agricultural Land
Williamson Act - Non-Prime Agricultural Land
Williamson Act - Non-Prime Land in Non-Renewal
Non-Enrolled Land
Urban and Built-up Land
Water
City Limits or City Boundary
Highways
Public Land Survey System

Williamson Act - Prime Agricultural Land
Land which is enrolled under California Land Conservation Act contract and meets any of the following criteria (as set forth under California Government Code Section 51201):
1. Land which qualifies for rating as class I or class II in the Natural Resources Conservation Service land use capability classifications;
2. Land which qualifies for rating 80 to 100 in the Storie Index Rating;
3. Land which supports livestock used for the production of food and fiber and which has an animal carrying capacity equivalent to at least one animal unit per acre as defined by the United States Department of Agriculture;
4. Land planted with fruit or nut-bearing trees, vines, bushes or crops which have a nonbearing period of less than five years and which will normally return during the commercial bearing period on an annual basis from the production of unprocessed agricultural plant production not less than two hundred dollars per acre;
5. Land which has returned from the production of unprocessed agricultural plant production and has an annual gross value of not less than two hundred dollars per acre for three of the previous five years.

Williamson Act - Non-Prime Agricultural Land
Land which is enrolled under California Land Conservation Act contract and does not meet any of the criteria for classification as Prime Agricultural Land. Non-Prime Land is defined as Open Space Land of statewide Significance under the California Open Space Subvention Act (see California Government Code Section 16143), and may be identified as such in other documents. Most Non-Prime Land is in agricultural uses such as grazing or non-irrigated crops. However, Non-Prime Land may also include other open space uses which are compatible with agriculture and consistent with local general plans.

Williamson Act - Agricultural Land in Non-Renewal
During the Non-Renewal process, the annual tax assessment gradually increases. At the end of the 9-year Non-Renewal period, the contract is terminated.

Non-Enrolled Land
County land not enrolled with the Williamson Act Program.

Urban and Built-up Land
Land occupied by structures with a build density of at least one unit to one and one-half acres. The areal extent of Developed Land was provided by the Department of Conservation's Farmland Mapping and Monitoring Program.

The California Land Conservation Act of 1965 - commonly referred to as the Williamson Act - is the State's primary program for the conservation of private land in agricultural and open space use. It is a voluntary, locally administered program that offers preferential property taxes on lands which have enforceable restrictions on their use via contracts between individual landowners and local governments. For more information on the Williamson Act please contact the Department of Conservation, 801 K Street, MS13-71, Sacramento, CA 95814. Phone (916) 324-0850, email: dlrp@conservation.ca.gov, web page: www.conservation.ca.gov/DLRP

Maps depicting Williamson Act enrollment are produced in cooperation with the participating counties and the California Department of Conservation's Division of Land Resource Protection using manual cartographic methods and Geographic Information Systems. The Department of Conservation is mandated to record, analyze and publish data regarding areas enrolled under Williamson Act contract.

The information necessary to depict areas enrolled under contract was derived from sources supplied by county planning agencies and / or assessor offices. This map is intended for internal review and update only and should be used within the limits of this purpose. All questions regarding the contract status of specific property should be directed to the county assessor or planning agency office.

The Department of Conservation makes no warranties as to suitability of this map for any particular purpose.

Printed on 03-03-2004

VULNERABILITY OF AMADOR COUNTY FROM SPECIFIC HAZARDS

Community 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. Further, other information can be collected, such as the location of critical community facilities (e.g., a fire station), historic structures, and valued natural resources (e.g., an identified wetland or endangered species habitat) that are within the specific hazard area. Together, this information portrays the impact, or *vulnerability*, of that area to that hazard.

Identified Hazard Risk Areas: Flood and Wildfires

The HMPC identified two hazards within the Planning Area where specific geographical hazard areas have been defined: flood and wildfires. For these two hazards, the HMPC has inventoried the following for each community, to the extent feasible, as a means of quantifying the vulnerability within the identified hazard areas:

- General hazard-related impacts, including impacts to life, safety and health;
- Values at Risk/Assessor Data (i.e., Types, numbers, and value of land and improvements);
- Insurance coverage, Claims paid, and Repetitive losses;
- Identification of Critical Facilities at risk;
- Identification of Cultural and Natural Resources at risk;
- Overall Community Impacts; and
- Development trends within the identified hazard area.

Vulnerability and potential impacts from hazards that do not have specific mapped areas, such as drought and severe weather, are discussed in more general terms, based on past events.

The Sections that follow present the vulnerability analysis for unincorporated Amador County, for each of the five incorporated communities and two special districts participating in this Plan.

VULNERABILITY TO FLOODS

100-year Flood: Risk - Occasional; Vulnerability – High
< 100-year Flood/Localized Flooding: Risk – Likely; Vulnerability - Medium

Historically, portions of Amador County have always been at risk to flooding. Flooding has occurred, both within the 100-year floodplain and in other localized areas. With the exception of Amador City, portions of all other incorporated cities in the County are at least partially located within the FEMA regulated 100-year floodplain. Flooding events generally occur throughout the county and have caused significant damages in the

western portion of the County, especially in the incorporated areas of City of Jackson, Ione, and Sutter Creek.

The risk potential or likelihood of a flood event occurring in the county increases with the annual onset of heavy rains from November through March. In addition to damages to area infrastructure, other problems associated with flooding include erosion, sedimentation, degradation of water quality, loss of environmental resources, and certain health hazards.

Insurance Coverage, Claims Paid, and Repetitive Losses

Unincorporated Amador County joined the NFIP on 09/24/1984. For the unincorporated portion of Amador County, there is one Flood Insurance Rate Map (FIRM):

Map Number	Effective Date
060015E	06/06/2000

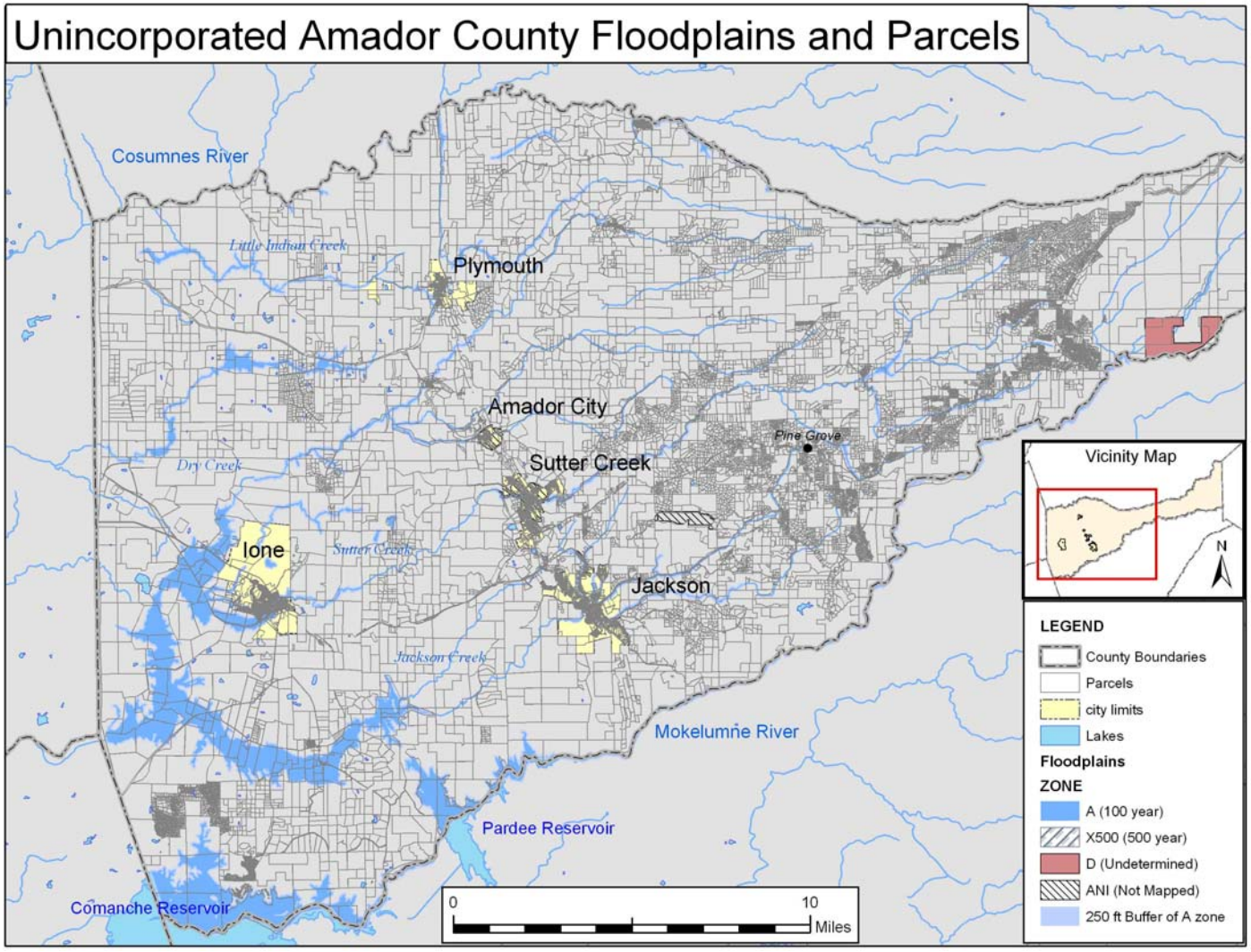
NFIP Insurance data indicates that as of 09/20/2005, there are 50 flood insurance policies in the unincorporated portions of the County, providing $8,287,900 of insurance coverage. 28 policies are for parcels located within the A and AE Zones; 22 policies are for parcels located within the B, C, and X Zones. There have been nine historical claims for flood losses totaling $94,309. Of the nine claims paid, four were within the A Zone totaling $16,211.07 and four were standard policy claims within the B, C, and X zone totaling $76,310.40. One of these claims was associated with a post-FIRM property located within a B, C, and X Zone (standard policy). Details associated with the ninth claim were unavailable.

According to the Draft California Multi-Hazard Mitigation Plan and FEMA insurance data, there are no RL properties located within the incorporated portions of the County.

Values at Risk

After evaluating available flood loss data, the next step was to quantify the flood vulnerability by jurisdiction. The HMPC used GIS to model and quantify potential flood losses to Amador County within the mapped floodplain areas using FEMA's Q3 100-year floodplain data and overlaying the information on Amador County's GIS parcel layers.

Specifically, the methodology involved intersecting parcels with the current FEMA Q3 100-year floodplain data (with a 250 foot uncertainty buffer). A 250 foot buffer on the 100-year floodplain is recommended when using this data in risk assessments to allow for uncertainty. A list of parcels that intersected the floodplain was generated. All parcels that touched the floodplain are included in the result. This file was linked with the assessor's data to quantify the value of property that potentially lies in a floodplain. The following map shows the floodplain, the 250-foot floodplain buffer and parcels for Unincorporated Amador County.



(Map Compilation: AMEC Earth & Environmental/ Source Data: Amador County GIS/FEMA Q3)

The result of the flood hazard analysis summarizes the values at risk in the floodplain of the unincorporated portions of Amador County.

UNINCORPORATED AMADOR COUNTY 100-YEAR FLOODPLAIN *VALUES AT RISK*						
Property Type	**Units Improved**	**Totals Improved**	**Units Vacant**	**Totals Vacant**	**Grand Totals**	
					Units	**$$**
Residential	559	$84,235,419	389	$16,357,369	**948**	**$100,592,788**
Commercial	48	$11,363,137	13	$927,524	**61**	**$12,290,661**
Industrial	8	$4,262,546	1	$125,821	**9**	**$4,388,367**
Agricultural	59	$18,556,915	329	$61,589,116	**388**	**$80,146,031**
Total Value	**674**	**$118,418,017**	**732**	**$78,999,830**	**1406**	**$197,417,847**

Base on this analysis, Unincorporated Amador County has significant assets at risk to the 100-year and greater floods. Of the 674 improved parcels located within the 100-year floodplain of the unincorporated portions of the County, only 28 of those parcel owners maintain flood insurance. This equates to only 4.2% of those living within the 100-year floodplain having insurance coverage in the event of a 100-year flood. Note that there are an additional 22 policy holders for parcels outside of the 100-year floodplain.

The values of identified parcels at risk for the areas located within the 100-year floodplain for all of Amador County is summarized in the table below. The valuation details for the incorporated communities are discussed in the Jurisdictional Element Section included at the end of this Section.

These values can be refined a step further. 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 values at risk in the following tables were further refined assuming 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 4 feet for two-story buildings with no basement.

Application of the 20% damage estimate to the Improved Parcel Value of $118,418,017 results in an estimated $23,683,603 at risk to damage from a 100-year flood within the unincorporated portions of the County. Thus there is a 1% chance in any given year of a 100-year flood causing $23,683,603 in damages. While there are several limitations to this model, it does present a methodology to estimate potential damages. Note, this model may include structures located within the 100-year floodplain that are elevated 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 are well

below the actual market value of improved parcels located within the 100-year floodplain. Thus the actual value of assets at risk is significantly above those included in the above calculation and tables.

AMADOR COUNTY
100-YEAR FLOODPLAIN
VALUES AT RISK

Property Type	Units Improved	Totals Improved	Units Vacant	Totals Vacant	Grand Totals	
					Units	$$
Amador City	0	$0	0	$0	0	$0
Ione	567	$90,559,261	110	$39,764,754	677	$130,324,015
Jackson	548	$159,061,784	126	$15,500,768	674	$174,562,552
Plymouth	61	$9,962,359	24	$693,889	85	$10,656,248
Sutter Creek	209	$36,490,829	32	$3,036,778	241	$39,527,607
Unincorporated County	674	$118,418,017	732	$78,999,830	1406	$197,417,847
Total Value	**2,059**	**$414,492,250**	**1,024**	**$137,996,019**	**3,083**	**$552,488,269**

*Values based on assessed value

Application of the 20% damage estimate to the Improved Parcel Value of $414,492,250 for all of Amador County, results in an estimated $82,898,450 at risk to damage from a 100-year flood in both the incorporated and unincorporated portions of the County.

In addition to the parcel information above, the Draft California Multi-Hazard Mitigation Plan estimates that 3.3 percent (or 1,144 people) of the total County population (of 35,100) reside within the 100-year flood plain.

While this analysis, attempts to quantify the risk in the unincorporated portions of the County to the 100-year flood, it does not fully capture the risk associated with specific problem areas identified in the Hazard Identification section of the plan. These problem areas identified by the County Public Works include areas located both within and outside of the 100-year floodplain. As previously stated, over the last 10-years, only 7.62% of all IA flood damage claims occurred in the 100-year floodplain. Heavy rains in higher and lower elevations have caused widespread street flooding and closures of roadways at creek crossings, minor landslides, and washouts of road shoulders and gravel roadways. Specific problem areas at risk to localized flooding include:

- Old Sacramento Road
- Spring Valley Road
- Fiddletown Road
- Quartz Mountain East
- Quartz Mountain North
- New Chicago Road
- Vaira Ranch Road
- Tonz Road
- Barney Road
- Irish Hill Road
- Carbondale Road
- Amador Creek Road
- Mayflower Road
- Turner Road

- Stringbean Alley
- Paine Road
- Martin Lane
- Jackson Valley Road
- Camanche Road
- Buena Vista Road
- Coal Mine Road
- Curran Road
- Maxwell Road
- Bell Road
- Ostorm Road
- Hale Road
- Sutter Creek Road
- Pine Grove/Volcano Road
- New York Ranch Road
- Argonaut Lane

Critical Facilities at Risk

As described earlier, critical facilities are located throughout the County. Amador County does not have a current mapped inventory of these facilities; therefore, the HMPC was unable to conduct an accurate analysis of critical facilities located within the mapped floodplain areas.

Cultural and Natural Resources at Risk

Amador County has substantial cultural and natural resources located throughout the County as previously described. However, the County does not currently have a current mapped inventory of this data to support further analysis of identified cultural and natural resources located within the mapped floodplain areas.

Overall Community Impact

Floods and their impacts will vary by community and will likely only affect certain areas of the County during specific timeframes. Based on the risk assessment, it is evident that flooding in some areas will have an economic impact on the community. However, many of the floods are minor, localized flood events creating more of a nuisance (e.g., maintenance issues and traffic disruptions) than a significant economic impact to a given area. The overall impact to the community from a devastating flood includes:

- Potential for loss of life and disruption of infrastructure;
- Commercial and residential structural damage;
- Damages to road/bridges resulting in loss of mobility;
- Possible damage/loss of sewer and drinking water treatment plants;
- Significant economic impact (jobs, sales, tax revenue) upon the community with the loss of commercial structures and impacts to the larger agricultural community;

- Negative impact upon commercial and residential property values; and
- Economic impacts due to washed out or flooded roads that necessitate detours:

Development Trends

The risk of flooding in future developments should be minimized by floodplain management within the County and its jurisdictions that participate in the NFIP and adherence to sound stormwater management practices for future development. Problems are occurring and could still occur in areas that have no mapped floodplain or where floodplain maps are inaccurate.

VULNERABILITY TO WILDFIRES

Risk – Likely; Vulnerability – High

Risk and vulnerability to the Amador County Planning Area from wildfire is of significant concern. High fuel loads (from dense vegetation) in Amador County, along with geographical and topographical features of the area, create the potential for both natural and human-caused fires resulting in loss of life and property.

According to the Amador County Fire Reduction Plan, Amador County, like most Sierra Nevada counties, is at very high risk of experiencing catastrophic wildfires. Because of the extensive distribution and quantities of wildland vegetation in Amador County, most of the County is considered to be in a WUI zone as shown in the map on the following page taken from Amador County's Fire Hazard Reduction Plan. Wildfires in the WUI pose great risks to life, property, and infrastructure and is one of the most dangerous and complicated situations firefighters encounter.

Many of the WUI areas within the County have high levels of fuel loadings due to aggressive fire suppression activities over the past 50 years by state and federal agencies. These high fuel loads have increased the potential for large catastrophic wildfires that could destroy millions of dollars of private and public property if they were to occur. The problem of fuel loading continues to grow with each passing year as chaparral and forest stands become more dense and as fire suppression continues to exclude fire from the natural ecosystem. This problem has been substantially increased by rapid population growth and residential building in the County's WUI areas.

These factors, when further combined with natural weather conditions common to the area, including periods of drought, high temperatures, low relative humidity, and periodic high wind conditions can result in frequent and catastrophic fires. Even the relatively flat, highly urbanized western portion of the County is not immune. Any fire, once ignited, has the potential to quickly become a large, out-of-control fire.

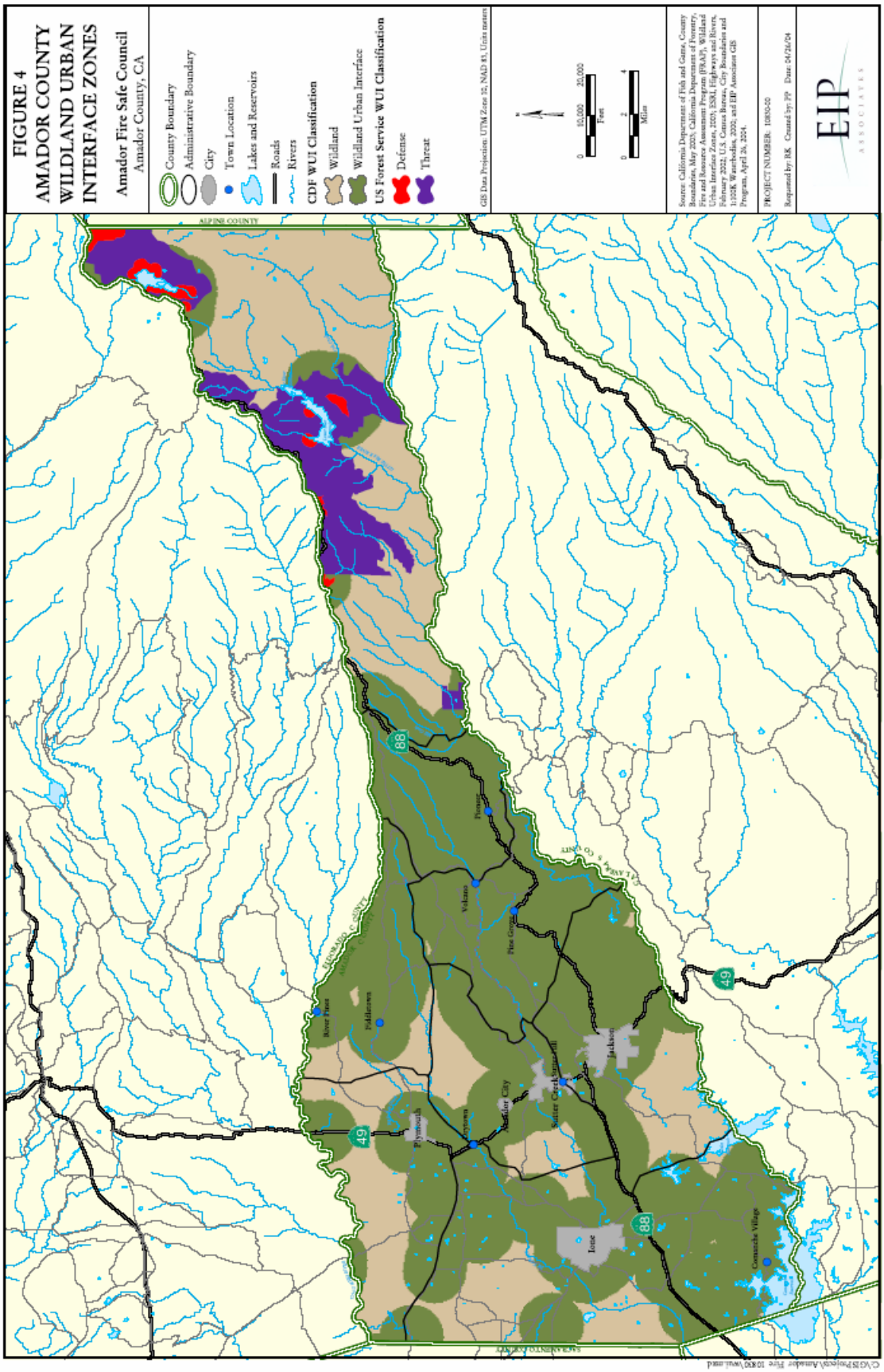


FIGURE 4
AMADOR COUNTY
WILDLAND URBAN
INTERFACE ZONES
Amador Fire Safe Council
Amador County, CA
County Boundary
Administrative Boundary
City
Town Location
Lakes and Reservoirs
Roads
Rivers
CDF WUI Classification
Wildland
Wildland Urban Interface
US Forest Service WUI Classification
Defense
Threat
GIS Data Projection: UTM Zone 10, NAD 83, Units meters
0 10,000 20,000 Feet
0 2 4 Miles
Source: California Department of Fish and Game, County Boundaries, May 2005, California Department of Forestry, Fire and Resource Assessment Program (FRAP), Wildland Urban Interface Zones, 2005, ESRI, Highways and Rivers, February 2002, U.S. Census Bureau, City Boundaries and 1:100K Waterbodies, 2002, and EIP Associates GIS Program, April 26, 2004.
PROJECT NUMBER: 10800.0
Requested by: RK Created by: PP Date: 04/26/04
EIP ASSOCIATES
ALPINE COUNTY
AMADOR COUNTY
CALAVERAS COUNTY
Pioneer
Volcano
Fiddletown
River Pines
Plymouth
Sutter Creek
Amador City
Jackson
Ione
Comanche Village
Pine Grove
88
49

According to the County's Fire Hazard Reduction Plan, both the National Fire Plan and the Ten-Year Comprehensive Strategy for Reducing Wildland Fire Risks to Communities and the Environment have placed a priority on working collaboratively within communities in the WUI. A major component of the National Fire Plan is funding for projects designed to reduce fire risks to people and their property. A fundamental step in realizing this goal is the identification of areas that are at high risk of damage from wildfire.

Thus, as required by federal law creating the National Fire Plan, CDF generated a list of communities at risk for wildfire. Specifically, the intent was to evaluate the risk to a given area from fire escaping off federal lands. Three main factors were used to determine wildland fire threat in the WUI areas of California. These include, 1) Ranking fuel hazards, 2) Assessing the probability of fire, and 3) Defining areas of suitable housing density that could create wildland-urban interface fire protection strategy situations. Those communities adjacent to federal lands (i.e., USDA Forest Service, Bureau of Land Management, Department of Defense, etc.) are indicated as such with an "F" in the Federal Threat column. The Hazard Level Code included on the list designates a community's fire threat level, with 3 indicating the highest threat.

The communities in Amador County and the identified risk to these communities from fire escaping off federal lands are listed in the following table.

AMADOR COUNTY COMMUNITIES AT RISK OF WILDFIRE

PLACE NAME	FED THREAT	HAZARD LEVEL
Amador City	F	3
Fiddletown	F	3
Ione	F	3
Jackson	F	3
Pine Grove	F	3
Pioneer	F	3
Plymouth	F	3
River Pines	F	3
Sutter Creek	F	3
Volcano	F	3

(Source: California Fire Alliance, www.cafirealliance.org)

Amador County Fire Hazard Reduction Plan Risk and Vulnerability Analysis

CDF also provides fire and other resource information to the public through its Fire Resource Assessment Program (FRAP) to identify those areas at greatest risk from wildfire. The 2004 Amador County Fire Hazard Reduction Plan (Fire Plan) includes a hazard and vulnerability analysis using FRAP data for purposes of identifying the potential locations of future fuel reduction projects. Data relied on in their analysis includes; Fire Hazard, Surface Fuels, Fuel Rank, Fire Threat, Condition Class, Fire Regime, and Fire Rotation Class.

For its analysis, the Fire Plan divided the County into nine administrative units. Each of the Units encompasses a population center except Unit 9, which covers the largely unpopulated eastern

end of the County. The following table and map taken from the Fire Plan identifies the locations of each Unit.

TABLE 3

ADMINISTRATIVE UNITS

Unit Name	Unit #	ZIP	Cities/Towns/Area
Plymouth	1	95669	Plymouth Shenandoah Valley
Ione	2	95640	Ione
Comanche	3	95640	Jackson Valley Lake Comanche
Jackson	4	95642 95654	Jackson Martell
Sutter/Amador	5	95685 95601	Sutter Creek Amador City
Fiddletown	6	95629	Fiddletown
Pine Grove	7	95665	Pine Grove
Pioneer/Volcano	8	95666 95689	Pioneer Volcano
Upcountry	9	95666	SPI Land USFS Land

Source: APSC

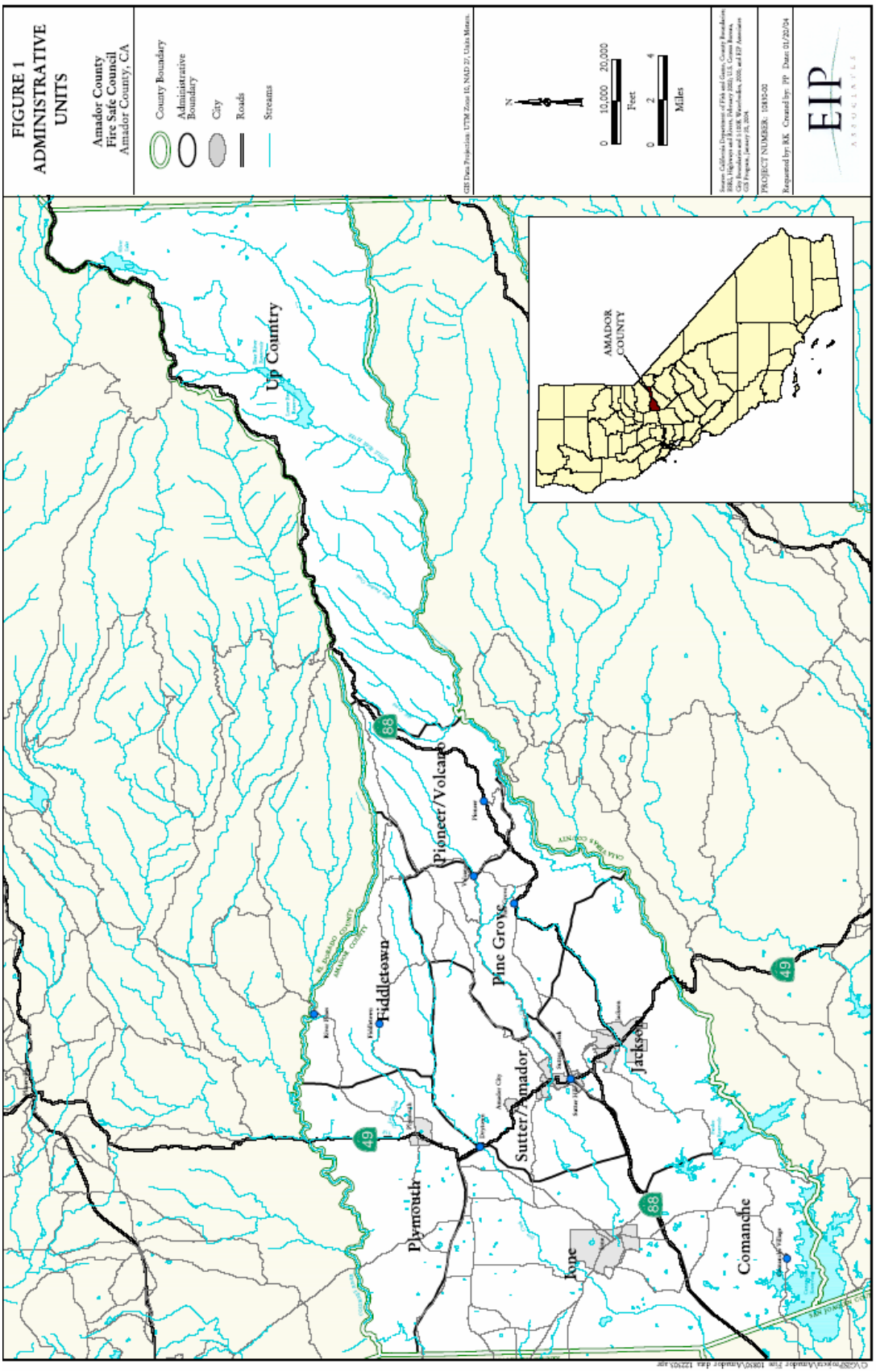


FIGURE 1
ADMINISTRATIVE UNITS
Amador County
Fire Safe Council
Amador County, CA
County Boundary
Administrative Boundary
City
Roads
Streams
N
0 10,000 20,000
Feet
0 2 4
Miles
AMADOR COUNTY
Up Country
Pioneer/Volcano
Pine Grove
Fiddletown
Sutter Amador
Jackson
Plymouth
Ione
Comanche
88
49
EIP

Fire Hazard

The Wildland Fire Hazard Map that follows shows the average hazard rating for areas throughout the County. The hazard rating zones are classified into three different ratings: Moderate, High or Very High. Zones were delineated based on areas with similar vegetative cover, slope and weather. The zones are designed to give an average hazard rating for the area. Variations in fuels, slope, weather, as well as factors not considered in this analysis such as aspect, elevation, and air stability will influence hazard conditions at actual locations within each zone. For individual structures, the risk of damage from fire also depends on site-specific factors such as access, water supply, clearance, and characteristics of the structure. The complete methodology for this assessment is detailed in the Amador County Fire Hazard Reduction Plan.

Unlike the Communities at Risk determination previously described, which looks at risk from fire escaping off federal lands, this analysis looks at the risk of fire occurring in a given area, based on conditions specific to that area.

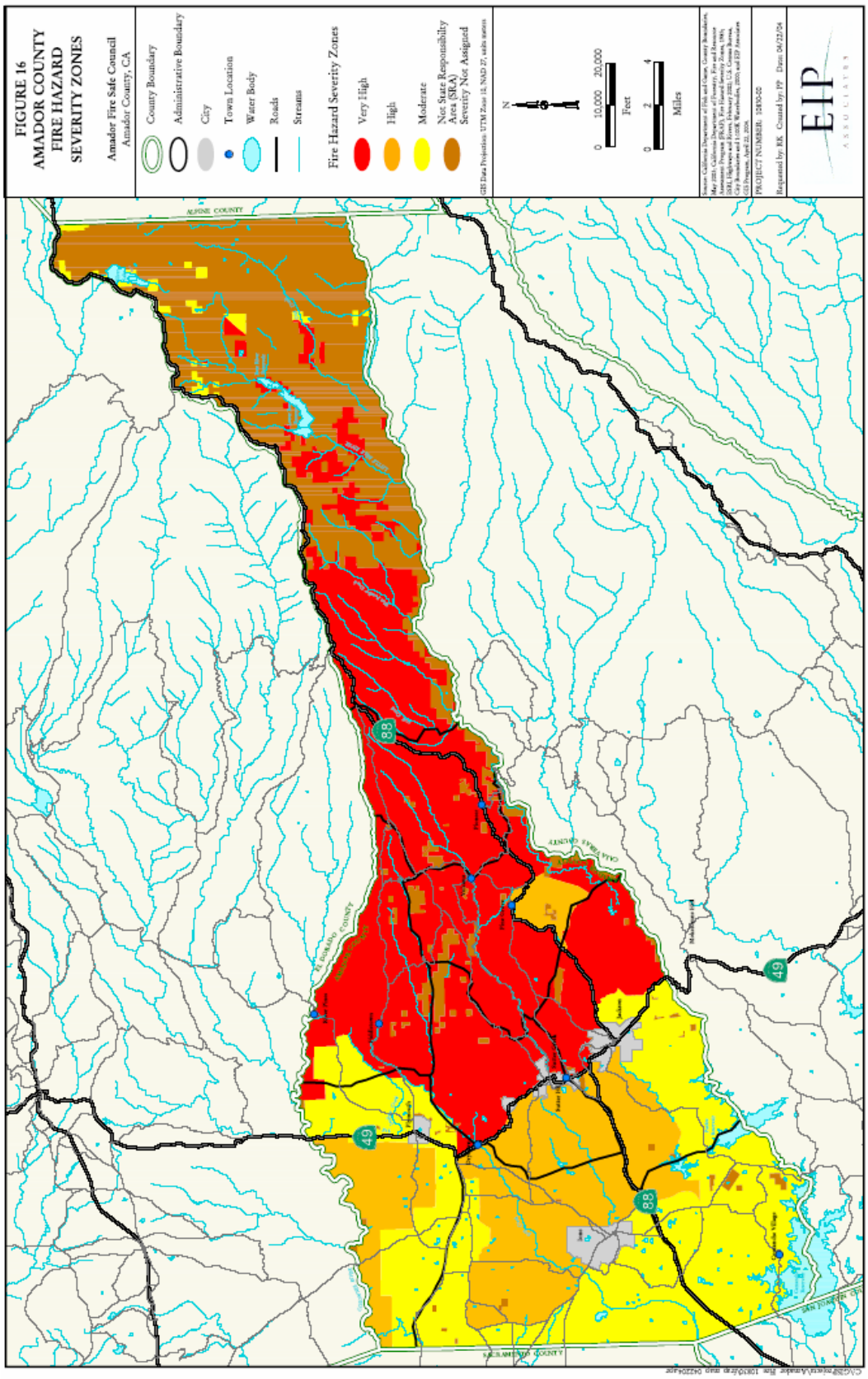


FIGURE 16
AMADOR COUNTY
FIRE HAZARD
SEVERITY ZONES
Amador Fire Safe Council
Amador County, CA
County Boundary
Administrative Boundary
City
Town Location
Water Body
Roads
Streams
Fire Hazard Severity Zones
Very High
High
Moderate
Not State Responsibility Area (SRA)
Severity Not Assigned
GIS Data Projection: UTM Zone 10, NAD 27, units meters
N
0 10,000 20,000
Feet
0 2 4
Miles
PROJECT NUMBER: 3850-05
Requested by: RK Created by: PP Date: 04/22/06
EIP
ASSOCIATES
ALPINE COUNTY
EL DORADO COUNTY
CALAVERAS COUNTY
SACRAMENTO COUNTY
88
49

Fire Threat

The Amador County Fire Hazard Reduction Plan also looked at Fire Threat in the community. Fire Threat is defined as a combination of two factors: 1) fire frequency, or the likelihood of a given area burning, and 2) potential fire behavior. These two factors are combined to create four threat classes ranging from moderate to extreme as shown in the map that follows. The complete methodology is set forth in the Fire Plan. Fire threat can be used to estimate the potential for impacts on various assets and values susceptible to wildfire. Impacts are more likely to occur and/or be of increased severity for the higher threat classes. The table that follows the map gives the Fire Threat acres within each administrative unit.

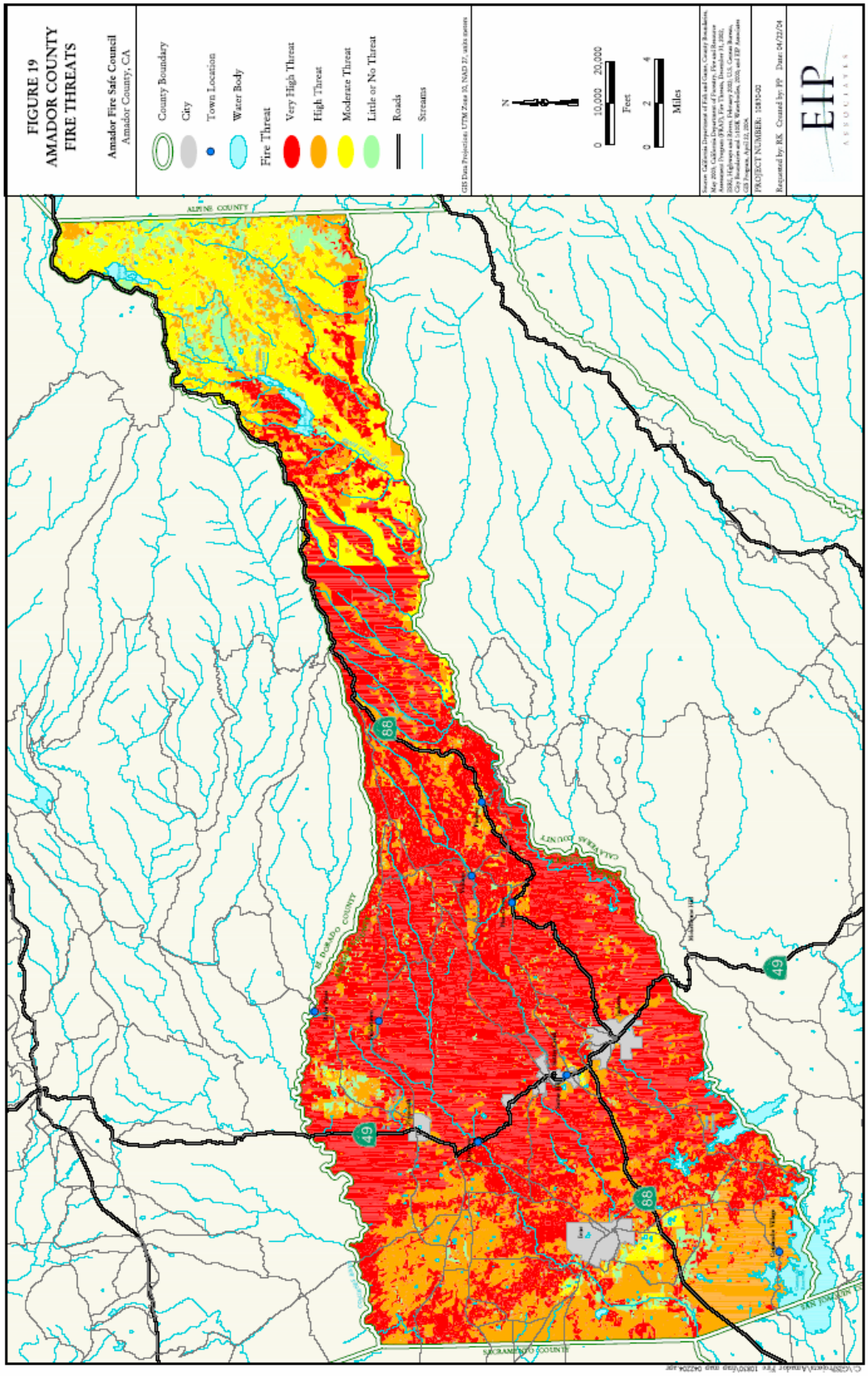


FIGURE 19
AMADOR COUNTY
FIRE THREATS
Amador Fire Safe Council
Amador County, CA
County Boundary
City
Town Location
Water Body
Fire Threat
Very High Threat
High Threat
Moderate Threat
Little or No Threat
Roads
Streams
GIS Data Projection: UTM Zone 10, NAD 27, units meters
N
0 10,000 20,000
Feet
0 2 4
Miles
PROJECT NUMBER: 5203-00
Requested by: RK Created by: PF Date: 04/22/04
EIP
ASSOCIATES
ALPINE COUNTY
EL DORADO COUNTY
CALAVERAS COUNTY
SACRAMENTO COUNTY
49
88

TABLE 13

AMADOR COUNTY
FIRE THREAT ACREAGE WITHIN ADMINISTRATIVE UNITS

Unit	Threat	Acres	Percent of Admin Unit	Percent of County
Plymouth	Little or No Threat	1,355	3.7	0.4
	Moderate	324	0.9	0.1
	High	11,982	32.5	3.1
	Very High	23,154	62.9	6.0
Ione	Little or No Threat	2,976	5.3	0.8
	Moderate	2,401	4.3	0.6
	High	25,891	46.1	6.7
	Very High	24,902	44.3	6.4
Comanche	Little or No Threat	3,575	11.4	0.9
	Moderate	312	1.0	0.1
	High	16,637	53.1	4.3
	Very High	10,794	34.5	2.8
Jackson	Little or No Threat	1,252	2.9	0.3
	Moderate	1,384	3.2	0.4
	High	8,583	20.1	2.2
	Very High	31,440	73.7	8.1
Sutter/Amador	Little or No Threat	378	1.3	0.1
	Moderate	524	1.8	0.1
	High	3,171	10.7	0.8
	Very High	25,453	86.2	6.6
Fiddletown	Little or No Threat	1,252	4.6	0.3
	Moderate	172	0.6	0.0
	High	3,488	12.8	0.9
	Very High	22,235	81.9	5.7
Pine Grove	Little or No Threat	886	2.9	0.2
	Moderate	164	0.5	0.0
	High	3,151	10.3	0.8
	Very High	26,534	86.3	6.9
Pioneer/Volcano	Little or No Threat	506	2.2	0.1
	Moderate	349	1.5	0.1
	High	5,253	22.8	1.4
	Very High	16,900	73.5	4.4
Upcountry	Little or No Threat	11,242	10.3	2.9
	Moderate	40,704	37.2	10.5
	High	23,979	21.9	6.2
	Very High	33,452	30.6	8.6

Source: CDF FRAP 2002

Values at Risk

Using the Fire Threat Map and other data compiled for the Fire Plan, the HMPC conducted additional analyses to identify and determine values of assets at risk in identified fire threat zones as described further below.

Information was extracted from the Fire Plan to quantify the potential wildfire losses to Amador County. Information included a listing by Administrative Unit of: 1) Assets at Risk and 2)A list of improved residential properties. Utilizing the list of improved residential properties, the County Assessor provided data on the average assessed value of improved residential properties by administrative unit to quantify the value of residential properties that are at risk to Wildfire in each Administrative Unit.

The results of this analysis are included in the following sections. The valuation details for the incorporated communities are discussed further in the Community Element sections included at the end of this section.

Assets at Risk

According to the Amador County Fire Plan, the primary goal of wildland fire protection is to safeguard the wide range of assets found across wildland areas. Assets at risk refer to real and societal values that have the potential for damaged by wildfire. CDF uses seventeen categories of assets and ranks each as to its risk from wildfire. Knowledge of the types and magnitudes of assets at risk to wildfire, as well as their locations, is critical to project selection and planning. The table below provides a description of the assets evaluated during this previous planning process.

Risk Factors

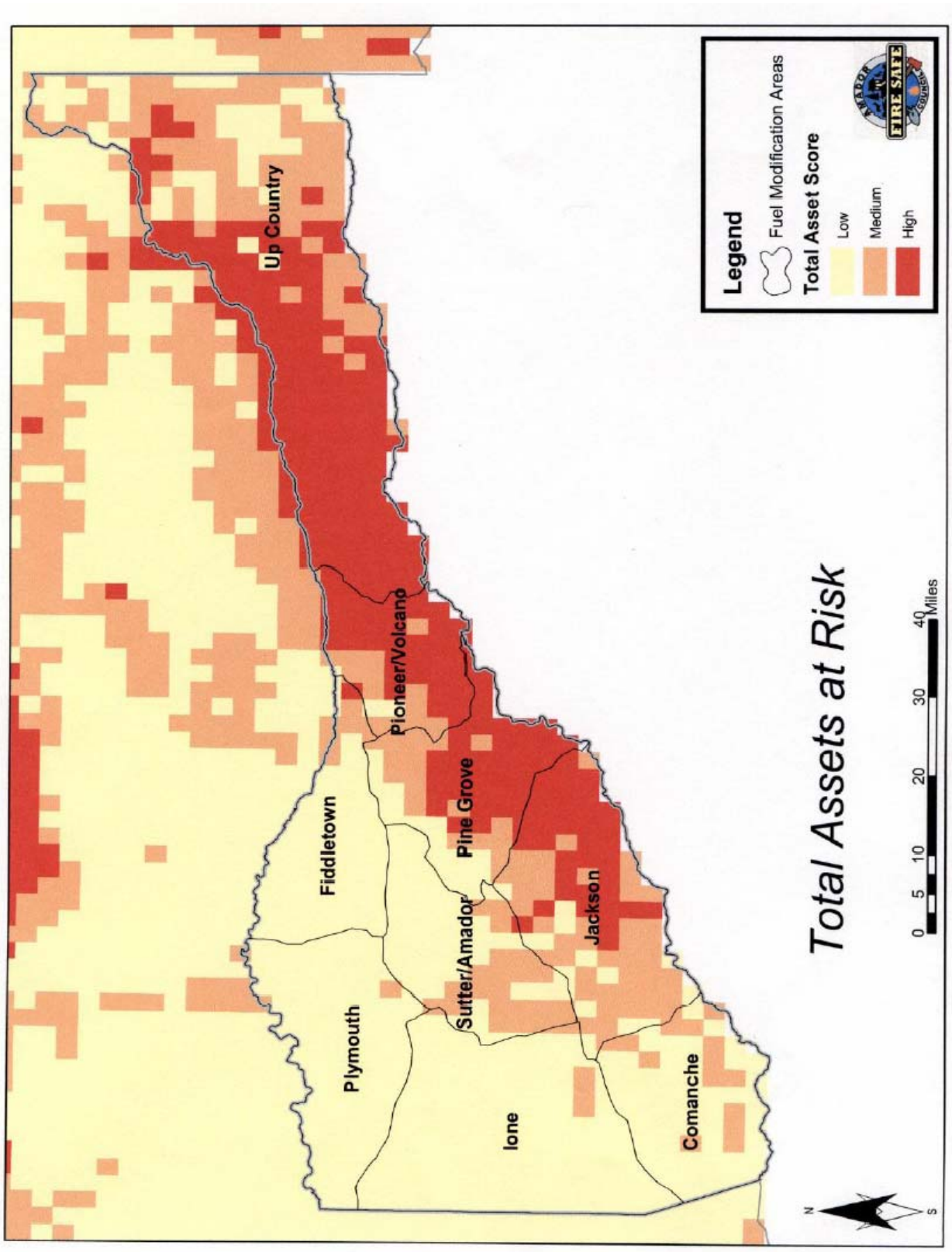
Asset at Risk	Public Issue Category	Location and ranking methodology
Hydroelectric power	Public welfare	1) Watersheds that feed run of the river power plants, ranked based on plant capacity; 2) cells adjacent to reservoir based plants (Low rank); and 3) cells containing canals and flumes (High rank)
Fire-flood watersheds	Public safety Public welfare	Watersheds with a history of problems or proper conditions for future problems, ranked based on affected downstream population
Soil erosion	Environment	Watersheds ranked based on erosion potential
Water storage	Public welfare	Watershed area up to 20 miles upstream from water storage facility, ranked based on water value and dead storage capacity of facility
Water supply	Public health	1) Watershed area up to 20 miles upstream from water supply facility (High rank); 2) grid cells containing domestic water diversions, ranked based on number of connections; and 3) cells containing ditches that contribute to the water supply system (High rank)
Scenic	Public welfare	Four mile view shed around Scenic Highways and 1/4 mile view shed around Wild and Scenic Rivers, ranked based on potential impacts to vegetation types (tree versus non-tree types)
Timber	Public welfare	Timberlands ranked based on value/susceptibility to damage
Range	Public welfare	Rangeland ranked based on potential replacement feed cost by region/owner/vegetation type
Air quality	Public health Environment Public welfare	Potential damages to health, materials, vegetation, and visibility; ranked based on vegetation type and air basin
Historic buildings	Public welfare	Historic buildings ranked based on fire susceptibility
Recreation	Public welfare	Unique recreation areas or areas with potential damage to facilities, ranked based on fire susceptibility
Structures	Public safety Public welfare	Ranked based on housing density and fire susceptibility
Non-game wildlife	Environment Public welfare	Critical habitats and species locations based on input from California Department of Fish and Game and other stakeholders
Game wildlife	Public welfare Environment	Critical habitats and species locations based on input from California Department of Fish and Game and other stakeholders
Infrastructure	Public safety Public welfare	Infrastructure for delivery of emergency and other critical services (e.g. repeater sites, transmission lines)
Ecosystem Health	Environment	Ranking based on vegetation type/fuel characteristics

To determine the relative value of these assets over a broad geographical area, CDF used the planning blocks of 450 acre Administrative Units as previously described. Assets within these blocks were inventoried and each given a numerical rating. These ratings produced a Total Asset Score for each 450-acre block as presented in the following table.

Assets at risk by fuel modification management areas

FMMA	Low	Medium	High	Ranking
Plymouth	99%	1%	0%	9
Ione	96%	4%	0%	8
Comanche	92%	8%	0%	7
Jackson	16%	43%	41%	4
Sutter/Amador	69%	31%	0%	5
Fiddletown	91%	9%	0%	6
Pine Grove	24%	28%	48%	3
Pioneer/Volcano	5%	23%	72%	1
Upcountry	13%	34%	53%	2

The “Total Assets at Risk” map, that follows, illustrates the ranking of each 450-acre plot. This ranking provides a means of identifying areas having the highest combined asset values at risk. Based on this analysis, it is clear that the highway 88 corridor from Pine Grove eastward scores highest.


Legend
Fuel Modification Areas
Total Asset Score
Low
Medium
High
Total Assets at Risk
Up Country
Pioneer/Volcano
Pine Grove
Fiddletown
Jackson
Sutter/Amador
Plymouth
Ione
Comanche
0 5 10 20 30 40 Miles
N
S

As indicated in the Fire Plan, the best measure of potential for a damaging fire is "Assets at Risk". When combined with other factors of fuels, weather, slope, residential structure density, etc., it is possible to develop a matrix which represents the relative potential for large damaging fires within each of the nine areas. This additional analysis is presented in the following table. Based on this analysis, the areas with the highest risk factors include: 1) Pioneer/Volcano, 2) Pine Grove, 3) Upcountry, and 4) Fiddletown. These areas are all located in the higher elevations, east of Highway 49. This area contains the most hazardous fuels, the most difficult terrain, and currently the largest population. In addition, most of the manmade values at risk from wildfire (e.g., structure, human, watershed improvement, etc.) are also located in the eastern portion of the County between highway 49 and the Eldorado National Forest Boundary.

Risk Factors by Fuel Modification Management Area (Highest risk =1, lowest = 7)

Risk Factor	Assets At Risk	Weather	Slope	Residential Distribu-tion	Hazardous Fuels Dis-tribution	Ladder Fuel Dis-tribution	Composite Score	Overall Ranking
Plymouth	9	6	8	8	7	7	45	7
Ione	8	8	9	4	8	8	45	7
Comanche	7	7	7	6	9	9	45	7
Jackson	4	5	6	3	6	6	30	6
Sutter/Amd.	5	4	4	5	5	5	28	5
Fiddletown	6	3	5	7	3	3	27	4
Pine Grove	3	3	2	1	2	2	13	2
Pioneer/Vol.	1	2	3	2	1	1	10	1
Upcountry	2	1	1	9	4	4	21	3

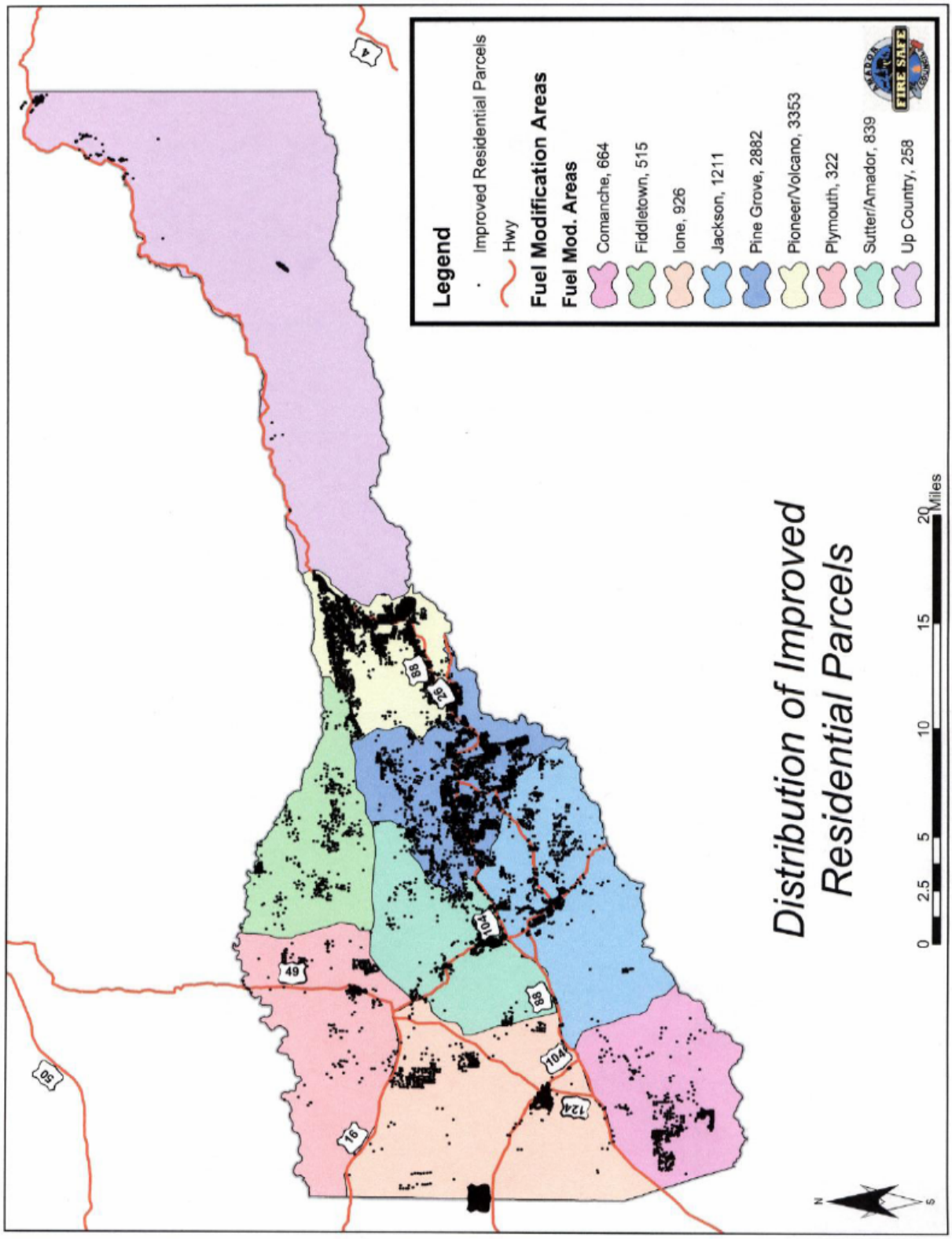
Value of Improved Residential Properties

Deserving of additional consideration when analyzing the risk and vulnerability of Amador County to wildfire, is the location of improved parcels throughout the County, with emphasis on residential property. This analysis originally conducted for purposes of the Fire Plan is provided below.

The Fire Plan looked at residential property distribution as a count of *improved* residential properties, not a count of properties zoned R1. According to the Plan, the number of residential structures present in each Administrative Unit is only important when combined with other risk factors that in combination create a wildfire environment capable of multiple structure losses. Not surprisingly, the greatest numbers of residential structures in Amador County are located in the highest risk areas. This poses a risk of massive structure losses should a catastrophic wildfire occur. A table of improved residential properties by Administrative Unit is provided below. A map detailing these areas follows.

Residential Structures Density by Fuel Modification Management Area

FMMA	Count	Ranking
Plymouth	322	8
Ione	926	4
Comanche	664	6
Jackson	1211	3
Sutter/Amador	839	5
Fiddletown	515	7
Pine Grove	2882	2
Pioneer/Volcano	3353	1
Upcountry	258	9


Legend
Improved Residential Parcels
Hwy
Fuel Modification Areas
Fuel Mod. Areas
Comanche, 664
Fiddletown, 515
Ione, 926
Jackson, 1211
Pine Grove, 2882
Pioneer/Volcano, 3353
Plymouth, 322
Sutter/Amador, 839
Up Country, 258
FIRE SAFE
Distribution of Improved Residential Parcels
0
2.5
5
10
15
20
Miles
N
S
4
88
26
49
104
16
124
50

Using this data identifying residential structures at risk to wildfire, the HMPC obtained both the average assessed and average market value of improved residential parcels for each area. The following table calculates the values at risk in the fire hazard zones associated with improved residential parcels.

AMADOR COUNTY
RESIDENTIAL VALUES AT RISK TO WILDFIRE

Administrative Unit	Number of Residential Structures	Average Assessed Value*	Total Average Assessed Value of Residential Structures
Plymouth	322	$112,648	$36,272,656
Ione	926	$161,581	$149,624,006
Comanche	664	$178,012	$118,199,968
Jackson	1,211	$162,323	$196,573,153
Sutter/Amador	839	$169,177	$141,939,503
Fiddletown	515	$178,012	$91,676,180
Pine Grove	2,882	$178,012	$513,030,584
Pioneer/Volcano	3,353	$178,012	$596,874,236
Upcountry	258	$178,012	$45,927,096
Totals	**10,970**	**-**	**$1,890,117,382**

*All average assessed values were calculated using County assessor data. The average assessed value of the unincorporated portions of the county were used for all unincorporated areas.

Other (Non-County) Assets at Risk

In addition to the vulnerability of the County and its jurisdictions, many other stakeholders reside or have significant assets in the area that should be considered in a vulnerability analysis. These stakeholders include individuals, agencies or business entities that could be directly impacted by a catastrophic wildfire. Impacts to stakeholders could range from increased demands on administrative and fire fighting resources, to direct loss of life and assets. The table below identifies these other stakeholders and summarizes their risks. A landowner distribution map follows.

TABLE 4

LAND OWNERSHIP

Stakeholders	Primary Interests At Risk	Estimated Acres At Risk	Acreage (%)
USDA, Forest Service	Natural Resources & Recreation	78,000[1]	21
USDI, Bureau of Land Management	Natural Resources & Recreation	8700[2]	2
Pacific Gas & Electric	Constructed Assets	1700[3]	0.5
Sierra Pacific Industries	Timber Resources	26,000[4]	7
State of California	Natural Resources, Recreation, & Constructed Assets	1,850[3]	0.5
County of Amador	Public Safety	All County	Not Applicable
California Department of Forestry & Fire Protection	Public Safety, Constructed Assets & Natural Resources	294,545 Acres SRA Lands[5]	Not Applicable
East Bay Municipal Utility District	Water Quality	11,000[6]	3
Miscellaneous and Small Private Property & Business Owners	Personal Safety & Constructed Assets	248,831[7]	66
Total County		376,081[6]	100

Acreage Sources & Comments:

1. Judy Yandoh, Amador Ranger District, USFS
2. Based on 2% of county as listed in 1999-2000 Sierra Nevada Wealth Index & verified with BLM's Folsom Office
3. Estimate derived from Parcel Quest Program
4. Craig Ostergaard, Sierra Pacific Industries
5. State Responsibility Lands means areas of the County in which the financial responsibility of preventing and suppressing fires has been determined pursuant to PRC 4125, to be primarily the responsibility of the State. SRA land in Amador County comprises 294,545 acres.
6. Susan Grijalva, Amador County Planning Department
7. This is the residual value required to balance to total County acreage

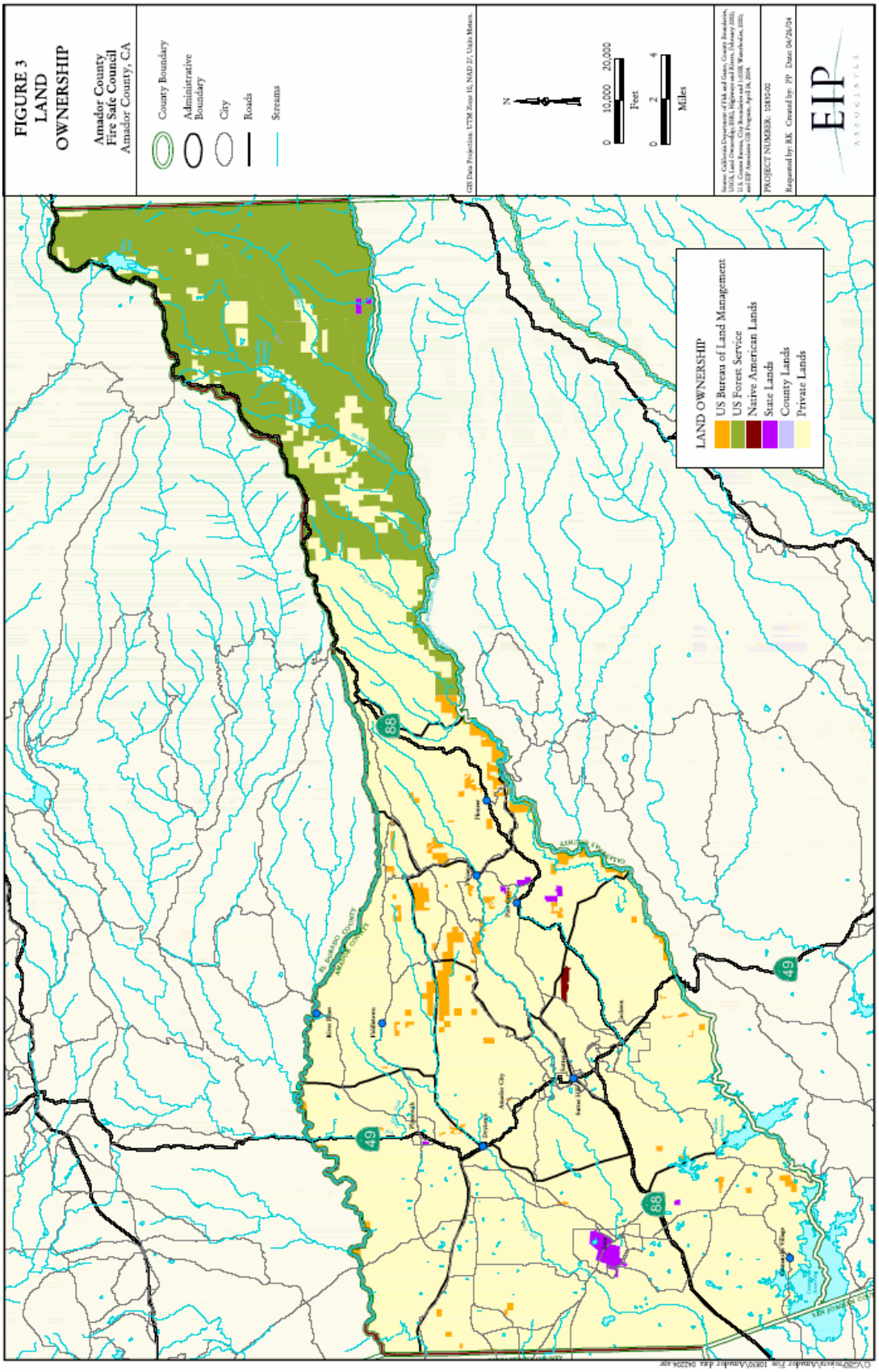


FIGURE 3
LAND
OWNERSHIP
Amador County
Fire Safe Council
Amador County, CA
County Boundary
Administrative Boundary
City
Roads
Streams
GIS Data Projection: UTM Zone 10, NAD 27, Units Meters
N
0 10,000 20,000
Feet
0 2 4
Miles
PROJECT NUMBER: 10450-00
Requested by: RK Created by: PP Date: 04/26/04
EIP
ASSOCIATES
LAND OWNERSHIP
US Bureau of Land Management
US Forest Service
Native American Lands
State Lands
County Lands
Private Lands
49
88
68

Critical Facilities at Risk

As described earlier, critical facilities are located throughout the County. Amador County does not have a current mapped inventory of these facilities; therefore, the HMPC was unable to conduct an accurate analysis of critical facilities located within the wildfire hazard areas.

With respect to firefighting capabilities, the following tables taken from the Fire Plan identifies the locations of Amador County Fire Stations and Lookouts that monitor conditions in and around Amador County.

TABLE 7

FIRE STATIONS IN AMADOR COUNTY

Manning	Department Name	Station #	Address	City	Comments
Volunteer	Amador Fire Protection District	Station 111	26517 Meadow Drive	Pioneer	Type 3 Engine/1500 gal Water Tender
Volunteer	Amador Fire Protection District	Station 112	23770 Van de Hei Ranch Rd.	Pioneer	Type 2 Engine (750 gal) & 3500 gal Water Tender
Volunteer	Amador Fire Protection District	Station 114	19840 Highway 88	Pine Grove	Type 2 Engine (800 gal) & Type 3 Engine/1500 gal Water Tender
Volunteer	Amador Fire Protection District	Station 115	18655 Ridge Road	Pine Grove	Type 2 Engine (500 gal)
Volunteer	Amador Fire Protection District	Station 121	16850 Demartini Road	Plymouth	Type 2 Engine (750 gal), Type 4 Engine & Type 1 Water Tender (3500 gal)
Volunteer	Amador Fire Protection District	Station 122	18534 Sherwood Street	Plymouth	Type 2 Engine (800 gal), Type 3 Engine & Telesquirt/50 ft.
Volunteer	Amador Fire Protection District	Station 123	14410 Jibboom Street	Fiddletown	Type 2 Engine (500 gal), Type 3 Engine & Type 1 Water Tender (3500 gal)
Full Time	Ca. Dept. of Forestry (CDF)	Dew Drop-St. 10	29300 Dew Drop Bypass	Pioneer	
Part Time	Ca. Dept. of Forestry (CDF)	Mt. Zion-St. 80	19597 Highway 88	Pine Grove	
Full Time	Ca. Dept. of Forestry (CDF)	Pine Lodge-St. 30	15035 Shenandoah Road	River Pines	
Full Time	Ca. Dept. of Forestry (CDF)	Sutter Hill-St. 60	11660 Highway 49	Sutter Creek	
Volunteer	Ione Fire Department	Station 161	22 Jackson Street	Ione	Type 1 Engine, 2 x Type 2 Engines, Type 3 Engine/Water Tender (1200 gal) & Telesquirt
Volunteer	Jackson Fire Department	Station 131	Main Street & Highway 49	Jackson	Type 2 Engine (500 gal) & Type 3 Engine (500 gal)
Volunteer	Jackson Fire Department	Station 132	10600 Argonaut Lane	Jackson	Type 1 Engine (500 gal), Type 2 Engine (500 gal) & Telesquirt/75 ft.
Volunteer	Jackson Valley FPD	Station 171	2480 Quiver Drive	Ione	2 x Type 2 Engines & Type 1 Water Tender (2200 gal)
Volunteer	Jackson Valley FPD	Station 172	5700 Buena Vista Road	Ione	Type 2 Engine
Volunteer	Kirkwood Fire Department	Kirkwood Meadow	Kirkwood Meadows	Kirkwood	
Volunteer	Lockwood FPD.	Station 151	23141 Shake Ridge Road	Volcano	2 x Type 2 Engines & Type 1 Water Tender (3500 gal)
Volunteer	Lockwood FPD.	Station 152	Hale Rd & Shake Ridge Rd.	Volcano	
Full Time	Mule Ck. State Prison FD	n/a	4001 Highway 104	Ione	
Volunteer	Sutter Creek FPD	Station 141	350 Hanford Street	Sutter Creek	3 x Type 1 Engines & Type 1 Water Tender (3000 gal)
Volunteer	Sutter Creek FPD	Station 142	Highway 49 & Church Street	Sutter Creek	Type 2 Engine
Volunteer	Sutter Creek FPD	Station 143	10791 Water Street	Amador City	Type 3 Engine
Full Time	US Forest Service	Amador Ranger Sta.	26820 Silver Drive	Pioneer	

TABLE 8 LOOKOUTS		
Lookout Name	**Managing Agency**	**Location**
Blue Mountain	USFS (CDF & private Prior to 2003)	Calaveras County
Mt. Zion	CDF	Amador County
Leek Springs	USFS	El Dorado County
Bald Mt.	USFS	El Dorado County
Big Hill	USFS	El Dorado County

Cultural and Natural Resources at Risk

Amador County has substantial cultural and natural resources located throughout the County as previously described. Additionally, utilizing data contained within the California Natural Diversity Database (CNDDB), the Amador County Fire Reduction Plan identifies natural resources at risk from Wildfire. The CNDDB is a repository of rare plant and animal information maintained by the Habitat Conservation Division of the California Department of Fish and Game (CDFG). The primary function of CNDDB is to gather and disseminate data on the status and locations of rare and endangered plants, animals, and vegetation types. This data helps drive conservation decisions, aids in better siting of development projects, provides baseline data helpful in recovering endangered species and for research projects.

During development of the Fire Plan, the CNDDB was queried for information on special status species in Amador County. The results of the query, indicated that within Amador County there are 22 special status species or communities and 115 recorded occurrences of those species or communities. A majority of the occurrences have been recorded near the western half of the county. Unique soil types in this region contribute to the unique communities found around Ione. A map detailing this information is included on the following page.

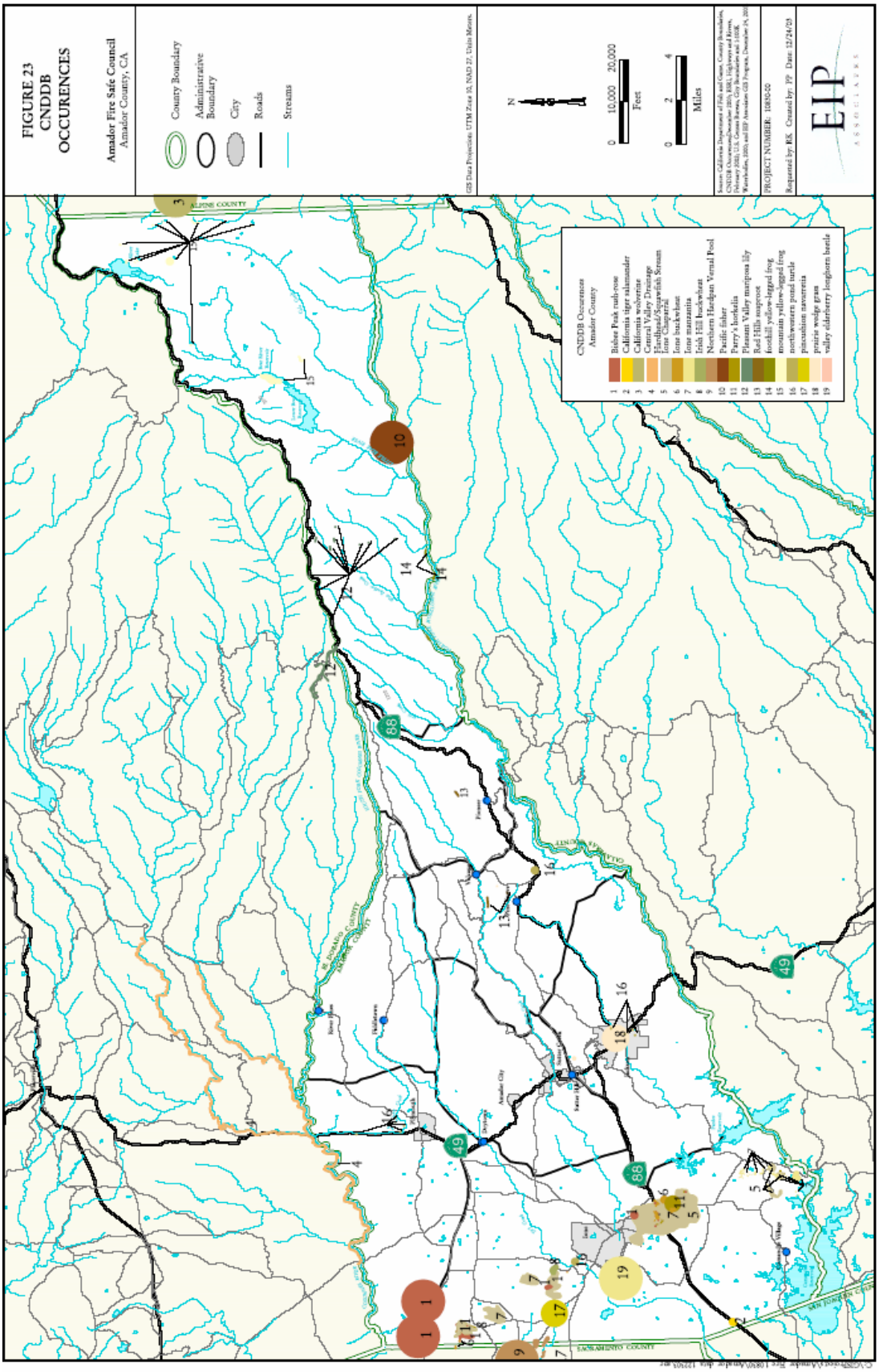


FIGURE 23
CNDDB
OCCURENCES
Amador Fire Safe Council
Amador County, CA
County Boundary
Administrative Boundary
City
Roads
Streams
GIS Data Projection: UTM Zone 10, NAD 27, Units Meters
N
0 10,000 20,000
Feet
0 2 4
Miles
PROJECT NUMBER: 1085020
Requested by: RK Created by: PP Date: 12/24/20
EIP
ASSOCIATES
CNDDB Occurences
Amador County
1 Bidens Peak rush-rose
2 California tiger salamander
3 California wolverine
4 Central Valley Drainage Hardhead/Squawfish Stream
5 Lime Chaparral
6 Lime buckwheat
7 Lime manzanita
8 Irish Hill Buckwheat
9 Northern Hardpan Vernal Pool
10 Pacific fisher
11 Parry's horkelia
12 Pleasant Valley mariposa lily
13 Red Hills soaproot
14 foothill yellow-legged frog
15 mountain yellow-legged frog
16 northwestern pond turtle
17 pincushion navarretia
18 prairie wedge grass
19 valley elderberry longhorn beetle
ALPINE COUNTY
CALAVERAS COUNTY
EL DORADO COUNTY
AMADOR COUNTY
SACRAMENTO COUNTY
Amador City
Ione
Jackson
Sutter Creek
Plymouth
Drytown
Fiddletown
River Pines
49
88
104
16
18
19
17
15
14
13
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9
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6
5
4
3

In addition, there are other natural resources at risk when wildland-urban interface fires occur. One is the watershed and ecosystem losses that occur from wildland fires. Another is the timber and ground cover assets that make up the life style and some commercial aspects of living in the area. Also to be considered is the aesthetic value of the area. Major fires that result in visible damage detract from that value. Tourism is a major attraction in Amador County. Because many Amador County communities border forested areas, the issues of watershed, forest products, wildlife, and recreation tourism are all critical elements to the County and surrounding areas and are all at risk from wildfire hazards.

Overall Community Impact

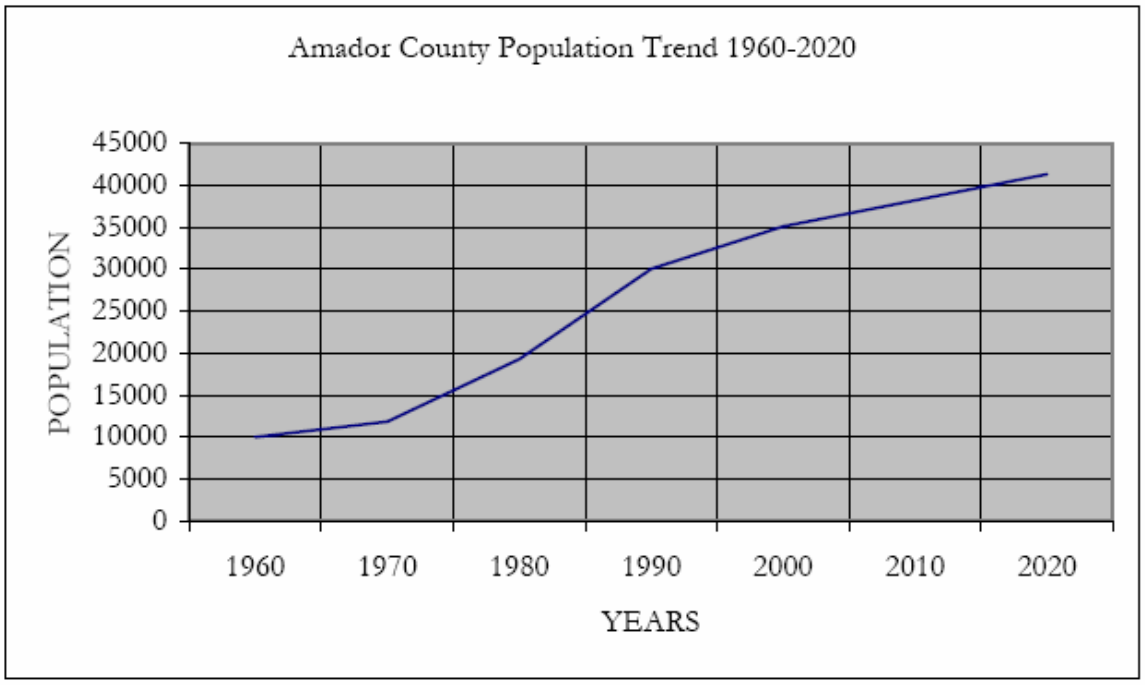
The overall impact to the community from a wildfire includes:

- Potential for injury and loss of life;
- Commercial and residential structural damage;
- Impact on the water quality of watersheds located within the county;
- Impact to natural resource habitats and other resources such as timber;
- Loss of water, power, roads, phones, and transportation could impact ability to sustain life for those with certain medical conditions;
- Significant economic impact (jobs, sales, tourism, tax revenue) upon the community with the loss of commercial structures;
- Negative impact upon commercial and residential property values;
- The loss of schools would severely impact the entire school system, with significant disruption to families and teachers as temporary facilities and relocations would be likely; and
- Major wildland fires within the community would have a significant impact on the overall mental health of the community.

Development Trends

Population growth and development in Amador County is on the rise. Much of this growth is occurring in previously undeveloped wildland interface areas.

The Amador County Fire Reduction Plan projects an 18% increase by the year 2020 over current population based on data produced by California EDD and the California Department of Finance, Demographics Research Unit. The largest population centers are currently found in the cities of Ione, Jackson, and Sutter Creek. The following graphic taken from the Fire Plan illustrates anticipated growth trends.



Source: California EDD

Current land use and development in Amador County is determined by the commercial practices and industries within the County which include: mining, timber, agriculture, grazing, hunting, fishing, federal leaseholders, transportation, tourism, and watershed management. The Eldorado National Forest covers about 22% of Amador County. The following table illustrates general land use categories and land distribution within the County.

TABLE 2

GENERAL LAND USE CATEGORIES

Land Use	Acres	%
Urban & Suburban (Residential, Commercial & Manufacturing)	108,619	29
General Agriculture *(Williamson Act - 1 Resident/40 ac.)*	94,028	25
Other Agriculture *(EBMUD, JVID, Non-Williamson Act)*	43,582	11
Timber Production *(Non-USFS/BLM)*	29,524	8
Federal Lands *(USFS, BLM & Mokelumne Wilderness)*	100,328	27
Total County	376,081	100

Source: Amador County Planning Department files, September 2003.

According to data from the Fire Plan, in over 70% of the County, residential growth is either prohibited (e.g., federal lands), or limited to large acreages. The major development trend is toward greater densities of homes where development is permitted. Growth areas tend to be in and around the incorporated cities and in the urban/forest intermix zone. The Amador County Development Policy states that "Future residential development will be encouraged to take place in the form of farms, ranches, and estates throughout the County or through expansion of existing towns and villages…" The increasing density of residences in the intermix zone, especially east of highway 49, is of specific concern due to the extreme wildfire hazard in this

area. As long as the County continues to expand into these areas, the County's vulnerability to wildfires will increase proportionately.

Other Identified Hazards: Avalanches, Agricultural Hazards, Dam Failure, Drought, Earthquakes, Landslides, Natural Health Hazards, Severe Weather, Volcanoes.

For the other hazards identified in the Hazard Identification section, information is available where the potential impacts can be developed or inferred, although it is not tied to a county-specific location. For these other identified hazards, the entire County is at risk. The following sections describe the vulnerability of the Amador County Planning Area to these other hazards.

VULNERABILITY TO AVALANCHES

Risk – Occasional; Vulnerability - Low

Avalanches following snowstorms often occur and have historically resulted in a few reported injuries within the County. Given the terrain and areas of development, the avalanche hazard within the County is limited to a few areas in the eastern portion of the County as previously described. The Kirkwood Ski Area is the primary area of concern for avalanche hazards due to the sloped terrain and the number of people using the area. However, the ski area has conducted a series of Design-Magnitude Avalanche Mapping and Mitigation Analysis to guide future development in the area. As long the stipulated land use recommendations and restrictions are followed, injuries from avalanches should be limited.

VULNERABILITY TO AGRICULTUAL HAZARDS

Risk – Likely; Vulnerability - Medium

Given the importance of agriculture to Amador County, agricultural disasters continue to be an ongoing concern. The primary causes of agricultural losses are insect infestations and severe weather events, such as drought and freeze. According to the HMPC, agricultural losses occur on an annual basis throughout the County and are usually associated with these severe weather events.

VULNERABILITY TO DAM FAILURES

Risk – Unlikely; Vulnerability - High

Dam failure flooding can occur as the result of partial or complete collapse of an impoundment. Dam failures often result from prolonged rainfall and flooding. The primary danger associated with dam failure is the high velocity flooding of those properties downstream of the dam.

Based on available data, there are several major and minor dams that could potentially impact Amador County should a failure occur. Four of the dams have a capacity of 10,000 acre-feet of water or greater. The failure of any of these dams would flood downstream areas and could result in loss of life and property.

Inundation maps prepared as required by Dam Owners are on file with the county, and for national security purposes, access is limited. Without the use of inundation maps and given that a dam failure can range from a small, uncontrolled release to a catastrophic failure, no further analyses were done with respect to potential values and assets at risk in the inundation zones. Based on this planning level analysis, the mapped inundation zones generally follow the existing streams and drainage areas, and areas subject to flooding from a dam failure would primarily be those areas located along these streams and drainages.

VULNERABILITY TO DROUGHT

Drought: Risk – Likely; Vulnerability – Medium

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. A drought's effects impact various sectors in different manners and with varying intensity. Adequate water is the most critical issue; Agricultural, manufacturing, tourism, recreation, and commercial and domestic use all require a constant, reliable supply of water. As the population in the area continues to grow, so will the demand for water.

Based on historic information, the occurrence of drought in California, including Amador County is cyclical, driven by weather patterns. Drought has occurred in the past and will continue to occur in the future. The periods of actual drought with adverse impacts can vary from short to long term; often the period between droughts is extended. Although an area may be under an extended dry period, defining when a drought occurs is a function of drought impacts to individual water users. Since 1850, there have been 11 documented droughts in California. The vulnerability to Amador County from drought is usually county-wide and depending on the area can include reduction in water supply, agricultural losses, and an increase in dry fuels and beetle kill. It is this last drought affect, increase in dry fuels and beetle kill that will also leave the county more vulnerable to damaging wildfires.

VULNERABILITY TO EARTHQUAKES

Risk – Likely; Vulnerability -Low

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

CGS and USGS have done considerable work using GIS technology to identify populations in high seismic hazard zones in each California county. According to the California Draft Multi-Hazard Mitigation Plan, 2004, zero percent of Amador County's population is located in a High Seismic Hazard Zone.

Ground shaking, the principal cause of damage, is the major earthquake hazard. Many factors affect the potential damageability of structures and systems from earthquake-caused ground motions. Some of these factors include proximity to the fault and the direction of rupture, epicentral 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 percent 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 where:

> Everybody runs outdoors. Damage negligible in buildings of good design and construction; slight to moderate in well built ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken. Noticed by persons driving cars. (Bolt, 203)

The CGS Shaking Potential map shown in Section 4.1 is a 10 percent probability over 50 years of shaking intensity. Shaking is measured in a variety of ways, including peak ground acceleration, peak ground velocity, and spectral acceleration. This map is spectral acceleration, at one second frequency. The reason for looking at different frequencies is due to building response. In general, taller buildings may experience more damage by energy released in longer waveforms due to the harmonics of building sway, and ground shaking. Natural or artificially filled areas, such as the Marina District in San Francisco, tend to experience amplified motions, liquefaction, and associated ground failures that can cause extensive damage.

Fault rupture itself contributes very little to damage unless the structure or system element crosses the active fault. In general, newer construction is more earthquake resistant than older construction because of improved building codes and their enforcement. Manufactured housing is very susceptible to damage because rarely are their foundation systems braced for earthquake motions. Locally generated earthquake motions, even from very moderate events, tend to be more damaging to smaller buildings, especially those constructed of unreinforced masonry, such as was seen in the Oroville, Coalinga, Santa Cruz, and Paso Robles earthquakes.

Common impacts from earthquakes include damages to infrastructure and buildings (e.g., unreinforced masonry [brick] crumbling; architectural facades falling; underground utilities breaking, gas-fed fires; landslides and rock falls; and road closures). Earthquakes also can trigger secondary effects, such as dam failures, explosions, and fires that become disasters themselves.

Estimating Potential Losses

Earthquake losses will vary in Amador County depending on the source and magnitude of the event. Past studies of earthquake activity in the vicinity of Amador County were reviewed and information on potential risk and were used to develop HAZUS Level 1 earthquake scenarios for the County. Based on historical data, Amador County is located within a region with faults that are capable of producing maximum credible earthquakes of up to 6.5 magnitude and peak ground acceleration at the site between 0.1g to 0.2 g. The results of the HAZUS scenarios based on these parameters is summarized below.

HAZUS-MH Earthquake Scenarios

HAZUS-MH was utilized to model earthquake losses for Amador County. Two different arbitrary "what if" scenarios were chosen to represent two distinct differences in earthquake

hazards based on current and historic data. Level 1 analyses were run, meaning that only the default data was used and not supplemented with local building inventory or hazard data. There are certain data limitations when using the default data, so the results should be interpreted accordingly; this is a planning level analysis. The two scenarios were defined as follows:

Amador County Scenario #1
Probabilistic Earthquake
6.5 Magnitude
500 year Return Period (10% in 50 years)

According to HAZUS this moderate sized event in Amador County could induce economic loss in the vicinity of $144.81 million and deaths ranging from 1 to 3 depending upon the time of day.

Amador County Scenario #2
Probabilistic Earthquake
6.5 Magnitude
2,500 year Return Period (2% in 50 years)

According to HAZUS this more extreme event could induce significant economic loss in the vicinity of $398.68 million and deaths ranging from 4 to 10 depending upon the time of day.

The following table summarizes the HAZUS results.

HAZUS-MH EARTHQUAKE SCENARIO RESULTS

Impacts/Earthquake	Amador County M6.5 500 year (10% in 50 years)	Amador County M6.5 2,500 year (2% in 50 years)
Residential Bldgs. Damaged *(Based upon14,000 buildings)*	Slight: 3132 Moderate: 1291 Extensive: 265 Complete: 30	Slight: 4,629 Moderate: 3,148 Extensive: 941 Complete: 174
Casualty *(Based upon 2pm time of occurence)*	Without requiring hospitalization: 47 Requiring hospitalization: 10 Life Threatening: 1 Fatalities: 3	Without requiring hospitalization: 177 Requiring hospitalization: 48 Life Threatening: 8 Fatalities: 15
Displaced Households	37	167
Economic Loss	Property and Lifeline Damage: $144.81M	Property and Lifeline Damage: $398.68M
Damage to Schools *(Based upon 22 schools)*	None with at least moderate damage	One with at least moderate damage
Damage to Hospital *(Based upon 1 hospitals)*	None with at least moderate damage	One with at least moderate damage
Damage to Transportation Systems	None with at least moderate damage	One with at least moderate damage
Households w/out Power & Water Service *(Based upon 12,759 households)*	No loss of power Water loss @ Day 1: 1,643 Water loss @ Day 3: 221 Water loss @ Day 7: 0 Water loss @ Day 30: 0	No loss of power Water loss @ Day 1: 6,149 Water loss @ Day 3: 4,659 Water loss @ Day 7: 1,099 Water loss @ Day 30: 0

VULNERABILITY TO LANDSLIDES/DEBRIS FLOWS

Risk –Likely; Vulnerability - Low

Landslides and mudslides are a documented hazard in the County. Impacts from landslides primarily involve damage to infrastructure, utility systems, and roads. Road closures can further impact emergency response efforts and interrupt business and school activities. Historically landslides resulting in significant losses have been limited within the County. Specific problem areas were previously identified in Section 4.1. Based on historical data, landslides will likely continue to occur in areas throughout the county, but the vulnerability of the County remains low.

VULNERABILITY TO LAND SUBSIDENCE

Risk –Occasional; Vulnerability - Low

Subsidence is an infrequent occurrence in Amador County, with few documented occurrences. However, given the history of mining in the area, there remains the potential for subsidence issues in the County in the future.

VULNERABILITY TO NATURAL HEALTH HAZARDS

West Nile Virus: Risk – Occasional; Vulnerability - Medium
Rabies: Risk – Occasional; Vulnerability - Medium

West Nile Virus

Both the risk and vulnerability to California from WNV is considered low, based on the percentage of total population that actually comes down with the disease. The first appearance of WNV in the United States occurred in 1999. As of August 2003, WNV has been documented in 46 states and the District of Columbia. In California, WNV was detected on a very limited basis in both horses and humans in 2003. In 2004, California saw more cases of WNV, including 830 human infections. There were no reported cases of WNV in humans in Amador County in 2004. In 2005, Amador County had 24 positive birds, seven equine cases and four human cases. To date, there have been 928 human WNV cases in California from 40 counties, with 18 WNV fatalities, including one person (over 65) from Amador County. For 2006, year-to-date, there have also been no reported cases of WNV in Amador County.

Although the potential for exposure does exist in Amador County, the risk and vulnerability should be considered in terms of adverse effects due to exposure. The county already has an active vector control program in place for mosquitoes. And most important, protective measures to prevent exposure are relatively simple and cost effective. Given the nature of protective measures, such as wearing long sleeved clothing and using bug spray, the responsibility for protection can and should be an individual responsibility. Amador County's current public education program should give the community both the knowledge as well as access to resources to effectively counter the risk and impact from WNV.

Rabies

In Amador County, Skunk Rabies is endemic, while only a small percentage of bats and other wild animals have rabies. According to the Rabies Task Force, rabies situations are on the rise in Amador County. Although, rabies continue to be detected in wild animals on a small scale throughout the County, there has only been one human rabies case resulting in death in 2002. The existence of the Rabies Task Force, combined with an increase in public education and implementation of a cat rabies vaccination ordinance, should serve to reduce the future occurrences of rabies within the County. As a result of these proactive measures, the vulnerability of the County to rabies should be considered low.

VULNERABILITY TO SEVERE WEATHER

Extreme Temperatures: Risk – Highly Likely; Vulnerability - Low
Heavy Rains/Thunderstorms/Wind/Hail/Lightning: Risk –Highly Likely; Vulnerability - Low
Snow: Risk –Highly Likely; Vulnerability - Low

The severe weather further evaluated as part of this risk assessment includes: Heavy Rains/Thunderstorms/Wind/Lightning; Snow; and Drought.

Extreme Temperatures

Extreme temperature events occur within Amador County on an annual basis. The elevation of the various portions of the County is a primary factor in determining the extent to which a given area is affected by temperature extremes. Those properties located within the lower elevation of the County generally experience high temperature extremes during the summer months, while the higher elevations of the County experience greater low temperature extremes during the winter months. In looking at historical data, there is no record of significant damages associated with extreme temperatures. It is the secondary impacts associated with extreme temperatures, such as fires and drought that are generally at issue. The risk and vulnerability associated with these secondary impacts are discussed in other sections.

Heavy Rains/Thunderstorms/Wind/Hail/Lightning

Looking at historical hazard data, severe weather is an annual occurrence in Amador County. Damages and disaster declarations related to severe weather events have occurred and will continue to occur in the future. Heavy rain and thunderstorms are the most frequent type of severe weather occurrence within the County. Wind and lightning often accompany these storms and have caused damage in the past. However, actual damages associated with the primary effects of severe weather have been limited. It is the secondary effects of 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 impacts are discussed in other sections.

Snow

Like most weather events, periods of heavy snow occur on an annual basis. Impacts to Amador County as a result of winter snow storms include damage to infrastructure, frozen pipes, utility outages, road closures, traffic accidents, and interruption in business and school activities. Also of concern is the impact to populations with special needs such as the elderly and those requiring the use of medical equipment. Delays in emergency response services can be of significant concern. Further, there are economic impacts associated with areas prone to heavy snow. Depending on the nature of a given storm, the eastern portion of Amador County is the most vulnerable to effects of snow. However, snowfall in the lower elevations can create significant issues, as they may not be as prepared for the heavy snowfalls.

VULNERABILITY TO VOLCANOES

Risk –Highly Unlikely; Vulnerability - Low

Although volcanoes are identified as one of the hazards adversely impacting California, Amador County's location relative to the two nearest active volcanoes limits both the County's risk and vulnerability to this hazard. The County's vulnerability from renewed volcanic activity from either the Long Valley Caldera or Lassen Peak would be limited to ashfall associated with large or very large explosive eruptions. Lessons learned from the 1980 Mt. St. Helens eruption demonstrate that the impact of distant ashfall is primarily clogging of motor air filters, difficulties with breathing in certain individuals, and resulting sediment issues.

JURISDICTIONAL ELEMENTS

Thus far, the planning process has identified the natural hazards posing a threat to Amador County and described, in general, the vulnerability of the county and communities to these risks. DMA regulations require that the HMPC evaluate the risks associated with each of the hazards identified through the planning process. For multi-jurisdictional plans, the regulations also require that the risks be further evaluated where a jurisdiction's risks vary from the risks facing the entire planning area. This section of the plan presents a summary, where data permits, of the possible impacts of identified hazards by participating jurisdiction. Note that data is provided only where the risk or impacts vary from those previously identified as impacting the entire Planning Area. If no additional data is included, it should be assumed that the risk and impacts to the affected jurisdiction would be similar to that previously described for the County.

The following sections present the jurisdictional elements for participating jurisdictions, including:

Incorporated Communities

- Amador City
- Ione
- Jackson
- Plymouth
- Sutter Creek

Districts

- Amador Water Agency
- Jackson Valley Irrigation District

For each participating jurisdiction, the following information is provided:

- Jurisdictional Background data
- Hazard Summary
- Vulnerability Assessment

The Capability Assessment for each participating jurisdiction is included in Section 4.3, which includes the Capability Assessment for all participating jurisdictions.

CITY OF AMADOR CITY

Population: 201 (2000 Census)
Area: 0.31 square miles
Elevation: 1420 feet above msl

Background

Amador City is located on Highway 49 in California's Gold Country (See County map on page 6). Amador City, like the County, is named for Jose Maria Amador, a wealthy California rancher who mined along the creek in 1848. Amador City was settled in the summer of 1851, after gold outcroppings had been prospected on both sides of Amador's Creek. The "Original" or "Little" Amador Mine (north) and the Spring Hill (south) were probably Amador County's first gold mines. The city's most famous and productive mine, the Keystone, was organized in 1853 and, before it closed for good in 1942, produced about $24 million in gold. Today Amador City offers a wide range of tourist activities, including nearby access to area wineries.

The benchmark elevation for the City is 954 feet above sea level. However, elevations range from as low as 900 feet to about 1,320 feet in the southeast portion of the City. The terrain is common for the foothills area of the Sierra Nevada, variable and dominated by grasslands. The main part of the City is located in an east-west trending Canyon created by Amador Creek, which serves as the primary drainage basin. Slopes vary, with a large part of the City in the 15-30% and 30%+ categories.

Hazard Summary

Based on information provided in the Safety Element portion of the County General Plan, 1974, a hazard summary for the Amador City is provided below.

SUMMARY HAZARD ANALYSIS: AMADOR CITY

Hazard	Frequency of Occurrence	Spatial Extent	Potential Magnitude	Significance
Avalanches	Unlikely	Limited	Negligible	Low
Dam Failure	Unlikely	Limited	Negligible	Low
Drought	Likely	Extensive	Limited	Low
Earthquakes	Occasional	Limited	Limited	Low
Floods	Likely	Limited	Limited	Medium
Hail	Occasional	Extensive	Limited	Low

SUMMARY HAZARD ANALYSIS: AMADOR CITY				
Hazard	**Frequency of Occurrence**	**Spatial Extent**	**Potential Magnitude**	**Significance**
Heavy Rains/Lightning	Occasional	Extensive	Limited	Low
High Winds	Occasional	Extensive	Limited	Low
Landslides	Occasional	Limited	Limited	Low
Natural Health Hazards	Likely	Limited	Limited	Low
Tornados	Likely	Limited	Negligible	Low
Wildfires	Likely	Extensive	Critical	High
Winter Storms	Likely	Limited	Negligible	Low

Guidelines:

Frequency of Occurrence
Highly Likely: Near 100% probability in next year.
Likely**:** Between 10 and 100% probability in next year, or at least one chance in ten years.
Occasional**:** Between 1 and 10% probability in next year, or at least one chance in next 100 years.
Unlikely**:** Less than 1% probability in next 100 years.

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

Potential Magnitude
Catastrophic**:** More than 50% of area affected
Critical**:** 25 to 50%
Limited: 10 to 25%
Negligible**:** Less than 10%

Significance (Your subjective opinion)—***Low***, ***Medium***, ***High***

Information provided by the HMPC identified the following hazards as the most significant to the City:

- Wildfires
- Floods

In addition, the HMPC provided historic incident information for the following events impacting Amador City.

- Wildfires in late 1800's and 1961
- Floods in 1995

Vulnerability Assessment

The following sections show the total value of property and key inventories at risk within Amador City.

Assets and Values at Risk

Utilizing Amador County assessor data, the total assessed values for Amador City are:

CITY OF AMADOR CITY *2005 Roll Values*						
Property Type	**Units Improved**	**Totals Improved**	**Units Vacant**	**Totals Vacant**	**Grand Totals**	
					Units	**$$**
Residential	91	$14,561,266	81	$1,313,210	**172**	**$15,874,476**
Commercial	12	$2,347,779	2	$115,858	**14**	**$2,463,637**
Industrial	1	$4,634	1	5,044	**2**	**$9,678**
Agricultural	1	$9,300	4	$214,420	**5**	**$223,720**
Total Value	**105**	**$16,922,979**	**88**	**$1,648,532**	**193**	**$18,571,511**

Critical Facilities Inventory

Utilizing the definition of critical facilities previously set forth in this Plan, the critical facilities in Amador City are listed below.

- Sewer Plant
- Firehouse
- City Hall
- Bridge on Highway 49

Cultural and Natural Resources at Risk

Cultural and natural resources in Amador City include those previously identified in the County inventory and as detailed below:

Cultural Resources

- Amador Hotel, Highway 49
- Amador History Museum
- Brick House, Highway 49
- Commercial Buildings, Highway 49
- False Front Buildings
- Keystone Mine and Mine House Inn
- Imperial Hotel, Highway 49

The continued preservation of the historic appearance, scale, and pattern of Amador City is critical to their current and future identity as well as their economic future. Also of significant value to the City are the hillsides surrounding the City core, both within and outside the City limits as well as the open, grazing, and low density residential County lands surrounding the City and the circulation approaches to the City. The aesthetics of all of these areas are critical to the protection of the visual character and identity of the town.

Natural Resources

Within the largely unimproved areas of the City, there are four major plant communities which serve as open space lands and provide key wildlife habitat. These plant communities include: oak woodland/chaparral, grassland, riparian drainage, and stream side riparian.

According to the City's Open Space Element of the General Plan, none of the endangered an/or rare plant species listed by the California Native Plant Society's publication *"Inventory of Rare and Endangered Vascular Plants of California"* or listed by the Department of Fish and Game's "*List of Designated Endangered or Rare Plants of California*" are know to exist in the City.

The potential for animal diversity in the City is significant because the plant communities offer a broad range of food, cover, roosting and nesting sites, and water. According to the City's Open Space Element of the General Plan, none of the endangered an/or rare species and fauna are listed in the "*Federal Register of Endangered and Threatened Wildlife and Plants*", and the California Department of Fish and Game's "*Endangered, Rare, and Threatened Animals of California*" are known to inhabit the City.

Of significant value to the City is Amador Creek and associated riparian and wetland habitats.

Development Trends

According to the 2004-2009 Housing Element of the Amador County General Plan, growth in Amador City has been limited. From 1990 to 2000, there was no change in the population of 196. Between 2000 and 2002, the population increased by 14 to 210. The projected growth rate for the County is 2% between 2005 and 2020. No growth projection rate was identified for Amador City.

Targeted for future development is an approximately 20 housing unit development planned for an area east of East School Street and North of Water Street.

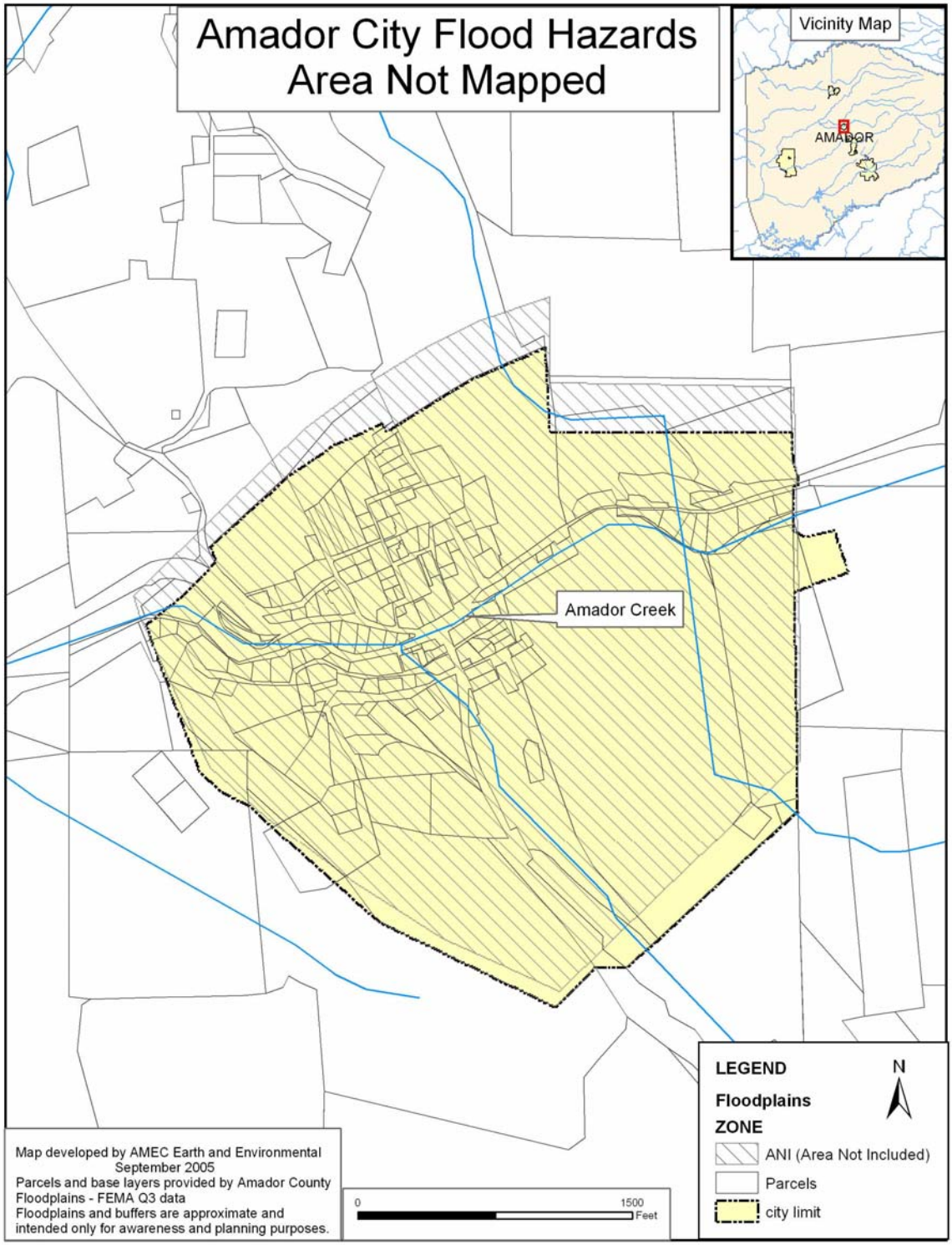
Vulnerability to Flood

The entire City is within the watershed of Amador Creek. Amador Creek originates east of the City, and its waters eventually join Rancheria Creek and then Dry Creek which exits the county to the west. Historical data indicates that flooding of the creek from its obvious high water mark is of minimal concern. Peak flows have remained within established floodway areas. However, increased runoff from new development in the area could increase the risk of floods.

Flooding along Amador Creek can occur during heavy or prolonged rains and generally affects houses, some businesses, and the sewer plant and pipelines.

Insurance Coverage, Claims Paid, and Repetitive Losses

FEMA data indicates that Amador City does not participate in the NFIP, and the City has never had its floodplains mapped. Further, there are no flood insurance policies in effect within the City limits and no identified RL properties. The map on the following page illustrates the streams traversing through the city and the lack of FEMA digital Q3 mapped floodplains.



MAP OF AMADOR CITY FLOODPLAIN

(Map Compilation: AMEC Earth & Environmental; Source Data:FEMA's Q3 data/Amador County Assessor)

Assets/Values at Risk

The100-year floodplain has never been mapped; there are no assets identified within this regulatory floodplain. However, Amador Creek traverses the City and has resulted in the localized flood issues putting the following assets at risk:

Critical Resources

- Sewer Plant
- Fire house
- Bridge on Highway 49

Cultural Resources

- Amador Hotel
- Imperial Hotel
- Businesses on north bank of Amador Creek

Natural Resources

- Amador Creek

Vulnerability to Wildfire

Fire is an ongoing concern to Amador City. Historic fires have occurred in and around the County for decades. The last large, devastating fire occurred in 1961. This fire, named the Rancheria Creek Fire, started in the Dry Creek area, and spurred by high winds quickly surrounded Amador City, causing the evacuation of the entire city. Before it was contained, the fire consumed an area 15 miles long and 31/2 miles wide, an estimated 30,000 acres. In historic Stringbean Alley, along the edge of Amador City, all but one structure burned to the ground.

According to the Amador County Fire Hazard Reduction Plan, the area encompassing Amador City is located within the Sutter/Amador Administrative Unit. Elevations within the unit range from approximately 600 feet to 2,200 feet above sea level. The area surrounding the city is mostly grasslands, with some brush and chaparral vegetation. Fire Threat is classified as Very High throughout the entire unit. Wildland and grassland fires can spread throughout the City from surrounding areas.

Assets/Values at Risk

Using the Fire Threat Map on page 157, in conjunction with County Assessor data, the values of identified parcels at risk within Amador City were determined and presented in the table below.

AMADOR CITY RESIDENTIAL VALUES AT RISK TO WILDFIRE				
Number of Improved Residential Structures	**Average Assessed Value**	**Total Average Assessed Value of Residential Structures**	**Average Market Value**	**Total Average Market Value of Residential Structures**
91	$160,014	$14,561,274	$300,000	$27,300,000

The following inventories identify other assets at risk to the wildfire hazard in Amador City.

Critical Resources

- Sewer Plant
- Firehouse
- City Hall

Cultural Resources

- All commercial and residential units with cultural value

Natural Resources

- Grassy hillsides and Oak woodlands

Vulnerability to Other (Non-Mapped) Hazards: Avalanches, Agricultural Hazards, Dam Failure, Drought, Earthquakes, Landslides, Natural Health Hazards, Severe Weather, Volcanoes

Except for those mapped hazards, flood and wildfire, the risk assessment for this plan, as previously described, covers the entire geographical extent of the County-wide Planning Area. Thus, the risk assessment for the County also includes and directly corresponds to the unincorporated portions of the County and all incorporated jurisdictions, including Amador City.

CITY OF IONE

Population: 7,214 (2000 Census)—includes 3,650 inmates at Mule Creek Prison
Area: 4.92 square miles
Elevation: 298 feet above msl

Background

Ione is located in the Ione Valley in the "Gold Country" (See County map on page 6), and is believed to be named by Thomas Brown around 1849 after one of the heroines in Edward Bulwer Lytton's drama "The Last Days of Pompeii." During the days of the Gold Rush, the miners knew the town by the names of "Bedbug" and "Freezeout." Unlike other communities in Amador County, which were founded on gold mining, Ione was a supply center, stage and rail stop and agricultural hub.

The Town of Ione continued to grow and prosper after its gold rush founding. The first school was built in 1853. The historic Methodist Church was organized in 1853 and the structure was completed in 1862. The first flour mill was built in 1855. The first brick building was built by Daniel Stewart in 1855 for his general merchandise store and is still owned and operated by the same family.

In 1876, Ione had a population of about 600 which included about 100 Chinese who lived in Ione's Chinatown. The town included one public school, 4 churches, 4 general stores, one meat market, one laundry, one brewery, a restaurant, millinery shop, an art gallery, six saloons, a drug store and barber shop, and many other business establishments. 1876 also marked the celebration of the completion of the railroad to the town of Ione.

The City of Ione was incorporated as a General Law City in 1953. The city houses many restaurants, businesses and retail establishments. Also located within the incorporated limits of the City of Ione, the Howard Park Industrial Park includes approximately 140 acres of land that fronts toward State Route 124. Tourism is still a big part of the City; Ione has many interesting landmarks and historical points of interest.

The City is located in the western boundary of the County, adjacent to Sacramento County. Elevation is approximately 298 feet above sea level. The terrain is relatively gentle and is dominated by grasslands.

The climate is generally moderate, with mild winters and hot, dry summers. Temperatures range from the low 40s°F to the high 90s°F, with an average daily maximum temperature of 74.7°F. The average annual rainfall is 20.5 inches, most of which occurs from November to April.

Hazard Summary

Based on information provided by the City of Ione, a hazard summary for the City is provided on the following page.

SUMMARY HAZARD ANALYSIS: CITY OF IONE				
Hazard	**Frequency of Occurrence**	**Spatial Extent**	**Potential Magnitude**	**Significance**
Avalanches	Unlikely	Limited	Negative	Low
Dam Failure	Unlikely	Limited	Limited	Low
Drought	Likely	Extensive	Limited	Low
Earthquakes	Occasional	Limited	Limited	Low
Floods	Likely	Limited	Limited	Low
Hail	Occasional	Extended	Limited	Low
Heavy Rains/Lightning	Occasional	Extended	Limited	Low
High Winds	Occasional	Extended	Limited	Low
Landslides	Unlikely	Limited	Negative	Low
Natural Health Hazards	Likely	Limited	Limited	Low
Tornados	Occasional	Limited	Negative	Low
Wildfires	Likely	Significant	Critical	Medium
Winter Storms	Unlikely	Significant	Negative	Low

Guidelines:

Frequency of Occurrence
Highly Likely: Near 100% probability in next year.
Likely**:** Between 10 and 100% probability in next year, or at least one chance in ten years.
Occasional**:** Between 1 and 10% probability in next year, or at least one chance in next 100 years.
Unlikely**:** Less than 1% probability in next 100 years.

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

Potential Magnitude
Catastrophic**:** More than 50% of area affected
Critical**:** 25 to 50%
Limited: 10 to 25%
Negligible**:** Less than 10%

Significance (Your subjective opinion)—***Low***, ***Medium***, ***High***

In addition, the HMPC provided historic incident information for the following events impacting the City of Ione.

Based on FEMA, for Disaster No. 1008, the City of Ione received the following for flood damage in three separate claims:

- $626,229
- $245,159
- $192,827

According to the City, recent storm drain projects solved some of the problem areas and similar damages are unlikely to reoccur.

Vulnerability Assessment

The following sections show the total value of property and key inventories at risk within the City of Ione.

Assets/Values at Risk

Utilizing Amador County assessor data, the total assessed values for the City of Ione are:

CITY OF IONE *2005 Roll Values*						
Property Type	**Units Improved**	**Totals Improved**	**Units Vacant**	**Totals Vacant**	**Grand Totals**	
					Units	**$$**
Residential	1241	$200,522,386	164	$44,113,723	**1405**	**$244,636,109**
Commercial	58	$15,405,784	4	$146,061	**62**	**$15,551,845**
Industrial	0	$0	0	$0	**0**	**$0**
Agricultural	3	$117,039	4	$16,894,838	**7**	**$17,011,877**
Total Value	**1,302**	**$216,045,209**	**172**	**$61,154,622**	**1474**	**$277,199,831**

Critical Facilities Inventory

Utilizing the definition of critical facilities previously set forth in this Plan, the critical facilities in the City of Ione are listed below.

- Ione Police Department
- Ione Fire Department
- Ione Elementary
- Ione Junior High
- Mule Creek Prison Hospital
- Preston Hospital
- Wieden (James A.) High

- Wastewater Treatment Plant
- Jackson Valley Energy LP (Electric Power Facility)

Cultural and Natural Resources at Risk

Cultural and natural resources in City of Ione include those previously identified in the County inventory and as detailed below:

Cultural Resources

- Five Mile Drive-Sutter Creek Bridge
- Ione City Centenary Church
- Scully Ranch
- The Community Methodist Church of Ione
- D. Stewart Co. Store

Natural Resources

- Ione Clay
- Parry Horkelia Plant
- Valley Elderberry Longhorn Beetle
- Ione Manzanita
- Ione Buckwheat

Development Trends

According to the 2004-2009 Housing Element of the Amador County General Plan, growth in the City of Ione has occurred; although not at the rate of most other incorporated cities within the County. From 1990 to 2000, there was a 9.4% increase in population from 6,516 to 7,129. The County average for that period was 16.8% for that same period. Between 2000 and 2010, the projected growth rate for the City is 11.6%. Annually, the City has seen a growth rate of 2.4%

Vulnerability to Flood

Flooding is a significant hazard to the City of Ione with certain areas of the city included in the FEMA-mapped 100-year floodplain. The major source of flooding in the City is associated with Sutter Creek, which runs through the southern part of the City. In the past, flooding has reached a depth of 4 feet in the downtown area. According to the Flood Insurance Study dated June 2000, most of the flooding is due to inadequate channel capacity. Other localized flooding, outside of the 100-year floodplain, occurs due to drainage problems that restrict flows.

Flood History

Documented flooding from Sutter Creek occurred in January 1980 and January 1995:

January 1980 – As reported in the *Amador Dispatch*, the 1980 flood event was an overflow of the channel near the Marlette Street mobile home park, approximately 0.5 miles upstream of the Five Mile Drive crossing of Sutter Creek. It was reported that the area was sandbagged and that evacuation of the mobile home park was considered; however, the flow receded and no major damage was reported. During this event the maximum record peak discharge was 6,950 cubic feet per second (cfs) which is the maximum recorded peak discharge for the 40 years of record at the gage.

January 1995 – Shallow flooding of Sutter Creek occurred on January 2, 1997. Overtopping occurred at several locations between the new Five Mile Drive Bridge of Sutter Creek and the 90 degree bend in the channel alignment located approximately 400 feet downstream of the intersection of Springcreek Drive and Marlette Street. Flooding was experienced by several properties located between the south bank of the creek and Marlette Street. South of Marlette Street, shallow flooding was experienced by some properties immediately west of the channel bend located west of Springcreek Drive.

Farther to the west, flooding was primarily contained in the streets south of Marlette Street. A portion of the floodwaters flowed west, down Marlette Street, and returned to Sutter Creek immediately upstream of the Five Mile Drive Bridge. Flooding also occurred to the south over the undeveloped area immediately east of the most easterly treatment-plant pond.

Street flooding, resulting from backwater from drainage outfall, was experienced at Springcreek Drive at the bend approximately 1,000 feet north of Marlette Street and at the intersection with Marlette Street.

Ponding of flood waters was also experienced on the golf course located on the north side of the creek, approximately 500 feet upstream of Five Mile Drive.

The abandoned Five Mile Drive Bridge experienced erosion damage and has been permanently removed. The new Five Mile Drive Bridge was not damaged.

There was no flooding near the Preston Avenue (Highway 104) crossing of Sutter Creek. The flow was contained by the existing channel and levees. There has been no documented flooding in the area immediately upstream and downstream of Highway 104.

Flood Protection Measures

Flood protection levees were built by the USACE along Sutter Creek in the City of Ione; however, the levees were not certified as providing protection from the 100-year flood. Flood and erosion-control retaining walls are located along Sutter Creek near the intersection of Preston and Main Streets; however, these structures do not provide protection from the 100-year

flood. A more detailed description of the location and floodwalls and levees within the City of Ione is provided below:

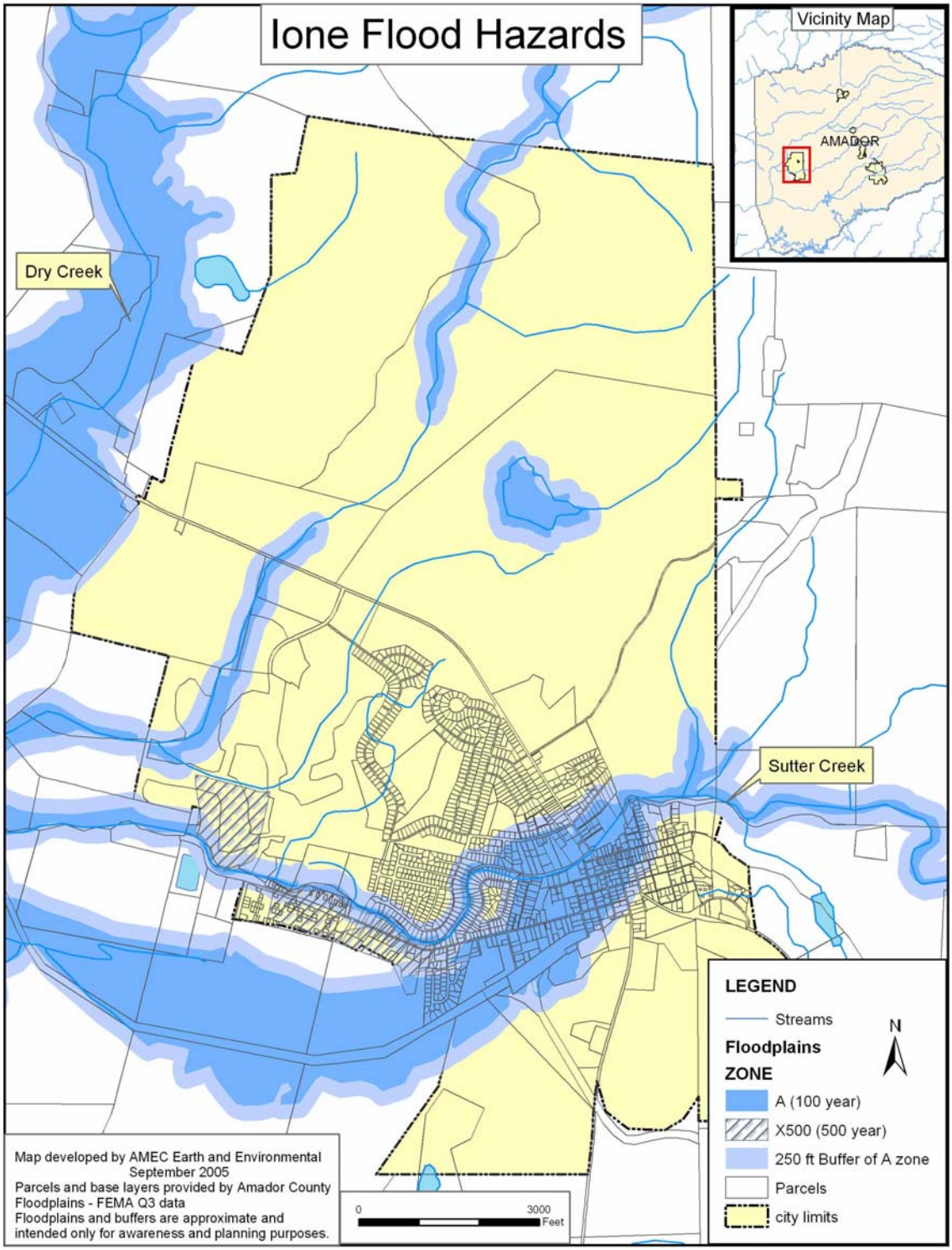
- Howard Park Retention Basin
- West Marlette Storm Drain System
- Ione Oaks Drainage Ditch
- A concrete floodwall on the south bank of Sutter Creek, starting at Preston Avenue Bridge and extending upstream approximately 300 feet.
- A levee on the south bank, starting at the end of the floodwall and extending upstream approximately 400 feet.
- A levee on the south side of Sutter Creek, from downstream of Preston Avenue and extending downstream approximately 500 feet.
- A levee on the north bank of Sutter Creek, from downstream of Preston Avenue and extending downstream approximately 900 feet.

The channel has been cleared and shaped at some locations, and stone slope protection has been placed at areas that were subject to erosion during the January 1995 flood event.

Back-flow prevention valves have been added to the major storm drain outfall structure located downstream of Highway 104 near the channel bend.

Assets/Values at Risk

The map on the following page intersects the City of Ione's parcel data with FEMA's Q3, 100-year floodplain data. Using this data, the value of parcels located within the 100-year floodplain was quantified and is included in the table that follows.



MAP OF CITY OF IONE FLOODPLAIN

(Map Compilation: AMEC Earth & Environmental; Source Data:FEMA's Q3 data/Amador County Assessor)

CITY OF IONE 100-YEAR FLOODPLAIN VALUES AT RISK*						
Property Type	**Units Improved**	**Totals Improved**	**Units Vacant**	**Totals Vacant**	**Grand Totals**	
					Units	**$$**
Residential	514	$79,144,700	105	$39,592,003	**619**	**$118,736,703**
Commercial	52	$11,326,238	3	$106,581	**55**	**$11,432,819**
Industrial	0	$0	0	$0	**0**	**$0**
Agricultural	1	$88,323	2	$66,170	**3**	**$154,493**
Total Value	**567**	**$90,559,261**	**110**	**$39,764,754**	**677**	**$130,324,015**
*Values based on assessed value						

Application of the 20% damage factor to the above values at risk for improved parcels of $90,559,261, results in $18,111,852 at risk of damage to the 100-year flood.

Insurance Coverage, Claims Paid, and Repetitive Losses

The City of Ione joined the NFIP on July 8, 1980. The following table identifies the existing FIRM map for the City of Ione.

CITY OF IONE	
Map Number	**Effective Date**
06000160005D	06/06/1980

NFIP Insurance data indicates that as of 09/20/2005, there are 76 flood insurance policies in the City of Ione resulting in $16,029,600 in Insurance in Force. Of these, 50 are located in the A, AH & AE Zones; 26 are located in the B, C, & X Zones. Historically, there have been two claims for flood losses totaling $3,692. One claim was for a property located within the A zone and the second claim was for a property located within the standard B, C & X Zone. Both claims were for Pre-FIRM structures. There are no RL properties within the City limits.

Analyzing this data, the City of Ione has significant assets at risk to the 100-year and greater floods. Of the 567 improved parcels located within the 100-year floodplain, only 50 of those parcel owners maintain flood insurance. This equates to only 8.8% of those living within the 100-year floodplain having insurance coverage in the event of a 100-year flood. Note that there are an additional 26 policy holders for parcels outside of the 100-year floodplain.

The following inventories identify other assets at risk to the flood hazard in City of Ione.

Critical Facilities

- Ione Police Department (within 100 year floodplain)
- Ione Fire Department (within 100 year floodplain)

There are three bridges that could be affected by floods. All the roads located in the flood zone and all buried utilities could be damaged by flooding. Replacement cost would be in the hundreds of thousands.

Cultural Resources

- Five Mile Drive-Sutter Creek Bridge
- Ione City Centenary Church
- Scully Ranch
- The Community Methodist Church of Ione
- D. Stewart Co. Store

Natural Resources

- Ione Clay
- Parry Horkelia Plant
- Valley Elderberry Longhorn Beetle
- Ione Manzanita
- Ione Buckwheat

Development Trends

New development is built according to the local floodplain management ordinance and should not be affected by flooding. In addition to requirements for new construction being built to the base flood (100-year) elevation, there are requirements for maintaining elevation certificates and implementing stormwater program elements and erosion or sediment controls for all new development within the floodplain.

Vulnerability to Wildfire

Fire is a significant concern to the City of Ione. Historic fires have occurred in and around the County for decades.

According to the Amador County Fire Hazard Reduction Plan, the area encompassing the City of Ione is located within the Ione Administrative Unit. Elevations in the Unit range from approximately 300 feet to 1,500 feet above sea level. The Unit is dominated by grasslands and Chapparral. The City of Ione is located in the southern portion of the unit, South of Dry Creek. The Fire Threat map indicates that the eastern portion of the unit has a more extreme fire threat than the west side. Other areas with a high fire threat include those areas dominated by chaparral. Ione is in an area ranging from areas of moderate fire threat in the southwestern corner of the City to areas of high and very high fire threat in the eastern and northern portions of the city.

Assets/Values at Risk

Using the Fire Threat Map on page 157, in conjunction with County Assessor data, the values of identified parcels at risk within the mapped fire risk categories in the City of Ione were determined and presented in the table below.

CITY OF IONE RESIDENTIAL VALUES AT RISK TO WILDFIRE		
Number of Improved Residential Structures	**Average Assessed Value**	**Total Average Assessed Value of Residential Structures**
514	$153,978	$79,144,692

The following inventories identify other assets at risk to the wildfire hazard in the City of Ione

Critical Resources

- Ione Police Department
- Ione Fire Department
- Ione Elementary
- Ione Junior High
- Mule Creek Prison Hospital
- Preston Hospital
- Wieden (James A.) High
- Wastewater Treatment Plant
- Jackson Valley Energy LP (Electric Power Facility)

Cultural Resources

- Five Mile Drive-Sutter Creek Bridge
- Ione City Centenary Church
- Scully Ranch
- The Community Methodist Church of Ione
- D. Stewart Co. Store

Natural Resources

- Ione Clay
- Parry Horkelia Plant
- Valley Elderberry Longhorn Beetle

- Ione Manzanita
- Ione Buckwheat

Development Trends
The City continues to grow at an annual growth rate of 2.4%. No development trends relative to the wildfire hazard were identified for the City of Ione.

Vulnerability to Other (Non-Mapped) Hazards: Avalanches, Agricultural Hazards, Dam Failure, Drought, Earthquakes, Landslides, Natural Health Hazards, Severe Weather, Volcanoes

Except for those mapped hazards, flood and wildfire, the risk assessment for this plan, as previously described, covers the entire geographical extent of the County-wide Planning Area. Thus, the risk assessment for the County also includes and directly corresponds to the unincorporated portions of the County and all incorporated jurisdictions, including the City of Ione.

CITY OF JACKSON

Population: 3,989 (2000 Census)-
Area: 3.47 square miles
Elevation: 1240 feet above msl

Background

The City of Jackson, at 1,200 feet, is located in the heart of California's historic Mother Lode in the Sierra Nevada foothills, 45 miles east of Sacramento and Stockton (See County map on page 6). Jackson began as a gold mining camp in 1848 and today is the County Seat. Jackson combines the gold rush era downtown district and Victorian era neighborhoods with modern subdivisions and shopping centers. Jackson enjoys a diversified economy supported by agribusiness, government, and tourism. Commercial activities include a major automotive dealership, two major grocery chain stores, and a variety of personal service providers. Jackson is also home to the only movie theater complex in Amador County, and hosts a number of well attended seasonal events and festivities that are famous throughout the Mother Lode, the Sacramento Valley, and Northern California. The Shenandoah Valley and its wineries are also close by.

Generally Jackson enjoys relatively mild conditions. The climate in Jackson is characterized by warm summer and moderate winter temperatures. The mean annual temperature in the Jackson area is 46F in January and 78F in July. The mean annual precipitation is 22 inches, of which 6.2 inches falls in January and only 0.2 inches in July.

Summer temperatures generally range between 80 and 102 degrees, with the occasional summer thunderstorm. During the winter months, temperatures can dip below the freezing mark but not for prolonged periods of time. Occasional snow will fall but normally not enough to impede normal living routines. Jackson rarely has, only about once every 8 years, more than usual snowfall activity. Jackson has very shallow to moderately deep, rocky or gravelly soils composed of metabasic rocks and metasedimentary slate and schist.

Jackson was born early in the Gold Rush when miners began working the area near Marshall's discovery site. In 1848, Col. Alden Jackson and his party set up camp near a spring in the center of town. For years, Jackson was known as a "Mother Lode Mecca." Pits and small shafts were used in the 1850s, but after placers ran out in the 1860s, hard rock mining was king. The downtown area of Jackson was almost totally destroyed by fire in August, 1862. Many downtown buildings date from the 1862-63 reconstruction.

Hazard Summary

Based on information provided by the City of Jackson, a hazard summary for the City is provided on the following page.

SUMMARY HAZARD ANALYSIS: CITY OF JACKSON				
Hazard	**Frequency of Occurrence**	**Spatial Extent**	**Potential Magnitude**	**Significance**
Avalanches	Unlikely	Limited	Negligible	Low
Dam Failure	Unlikely	Limited	Negligible	Low
Drought	Likely	Extensive	Catastrophic	Medium
Earthquakes	Unlikely	Extensive	Limited	Low
Floods	Likely	Limited	Limited	High
Hail	Likely	Extensive	Negligible	Low
Heavy Rains/Lightning	Highly Likely	Extensive	Limited	Low
High Winds	Highly Likely	Extensive	Catastrophic	Medium
Landslides	Occasional	Significant	Limited	Low
Natural Health Hazards	Occasional	Limited	Negligible	Low
Tornados	Unlikely	Extensive	Limited	Low
Wildfires	Occasional	Extensive	Catastrophic	Medium
Winter Storms	Likely	Extensive	Catastrophic	Medium

Frequency of Occurrence
Highly Likely: Near 100% probability in next year.
Likely**:** Between 10 and 100% probability in next year, or at least one chance in ten years.
Occasional**:** Between 1 and 10% probability in next year, or at least one chance in next 100 years.
Unlikely**:** Less than 1% probability in next 100 years.

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

Potential Magnitude
Catastrophic**:** More than 50% of area affected
Critical**:** 25 to 50%
Limited: 10 to 25%
Negligible**:** Less than 10%
Significance (your subjective opinion**)—*Low*, *Medium*, *High***

Vulnerability Assessment

The following sections show the total value of property and key inventories at risk within the City of Jackson.

Assets/Values at Risk

Utilizing Amador County assessor data, the total assessed values for the City of Jackson are:

CITY OF JACKSON 2005 Roll Values						
Property Type	**Units Improved**	**Totals Improved**	**Units Vacant**	**Totals Vacant**	**Grand Totals**	
					Units	**$$**
Residential	1589	$257,931,702	303	$13,034,048	**1892**	**$270,965,750**
Commercial	212	$126,585,097	48	$3,761,702	**260**	**$130,346,799**
Industrial	3	$4,153,159	6	$1,194,010	**9**	**$5,347,169**
Agricultural	2	$507,811	5	$11,928,490	**7**	**$12,436,301**
Total Value	**1,806**	**$389,177,769**	**362**	**$29,918,250**	**2,168**	**$419,096,019**

Critical Facilities Inventory

Utilizing the definition of critical facilities previously set forth in this Plan, the critical facilities in the City of Jackson are listed below.

- Sutter Amador Hospital
- City of Jackson Wastewater Treatment Plant
- Jackson Fire Department
- Jackson Police Department
- Amador County Criminal Court
- Amador County Sheriff
- Amador Independent Study School
- Amador County School District Headquarters
- Argonaut High School
- Jackson Elementary School
- Jackson Junior High School
- Special Education Center at Argonaut High School
- Hometown Radio Communication Facility

Cultural and Natural Resources at Risk

Cultural and natural resources in City of Jackson include those previously identified in the County inventory and as detailed below:

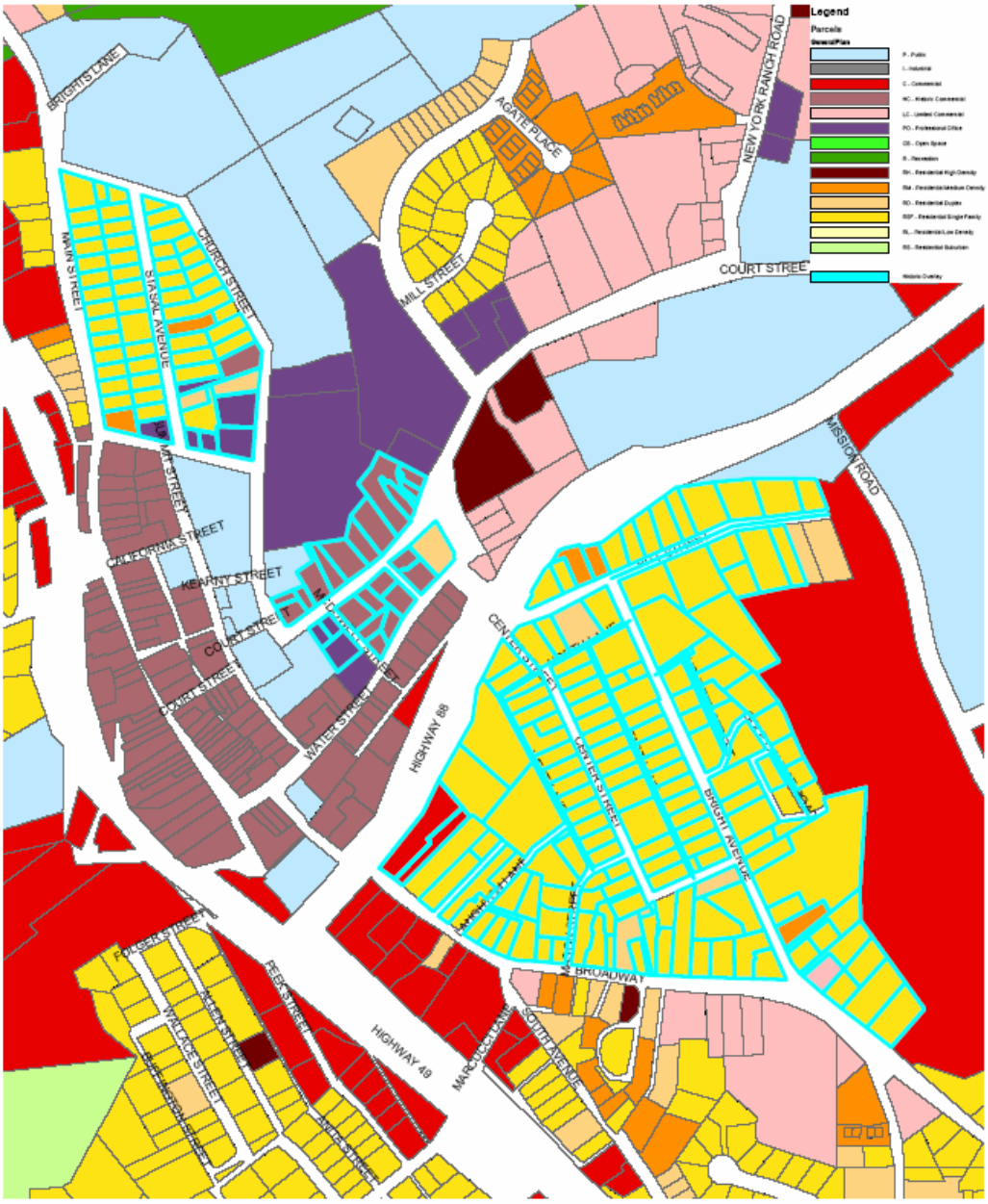
Cultural Resources

- Amador County Hospital Building (current District Attorney's office)
- Butterfield, John A., House
- Chihizola Family Store Complex
- DePue, Grace Blair, House and Indian Museum
- Jackson Downtown Historic District
- Kennedy Tailing Wheels
- Saint Sava Serbian Orthodox Church
- Pioneer Hall
- Site of Jackson's Pioneer Jewish Synagogue
- Brick House
- Hotel, Marcucci & Braodway
- National Hotel, Main & Water Streets
- Native Daughters of the Golden West Building
- Toll House
- Wells Fargo Express Office

Taken from the City of Jackson General Plan, the map that follows shows the historic overlay for the City.

GENERAL PLAN - Historic Corridor Overlay

October 2004



Natural Resources

The three forks of Jackson Creek converge between the civic center and historic Downtown Jackson. These creeks played a key role in the early settlement of the Jackson area, not just by the American settlers who came in search of placer gold in the 1850s, but for the Native Americans who preceded them as well. There are also abundant areas of oak woodland in developed and undeveloped areas within city limits.

Development Trends

According to the 2004-2009 Housing Element of the Amador County General Plan, growth in the City of Jackson has occurred, although not at the rate of most other incorporated cities within the County. From 1990 to 2000, there was a 12.5% increase in population from 3,545 to 3,989. The County growth average is 16.8% for that same time period. Based on information provided in the Land Use Element to the General Plan, annual growth projections for the City are projected at 2.67%.

According to the City of Jackson 2004 Land Use Element to the General Plan, the total size of the City of Jackson is 2,040.97 acres. Of this, the total amount of vacant land (most of which is residential) is approximately 1,315 acres. Based on vacant property within the City and the current and proposed uses of that property, it is assumed that within a 20 year period the following development will occur within the existing incorporated city:

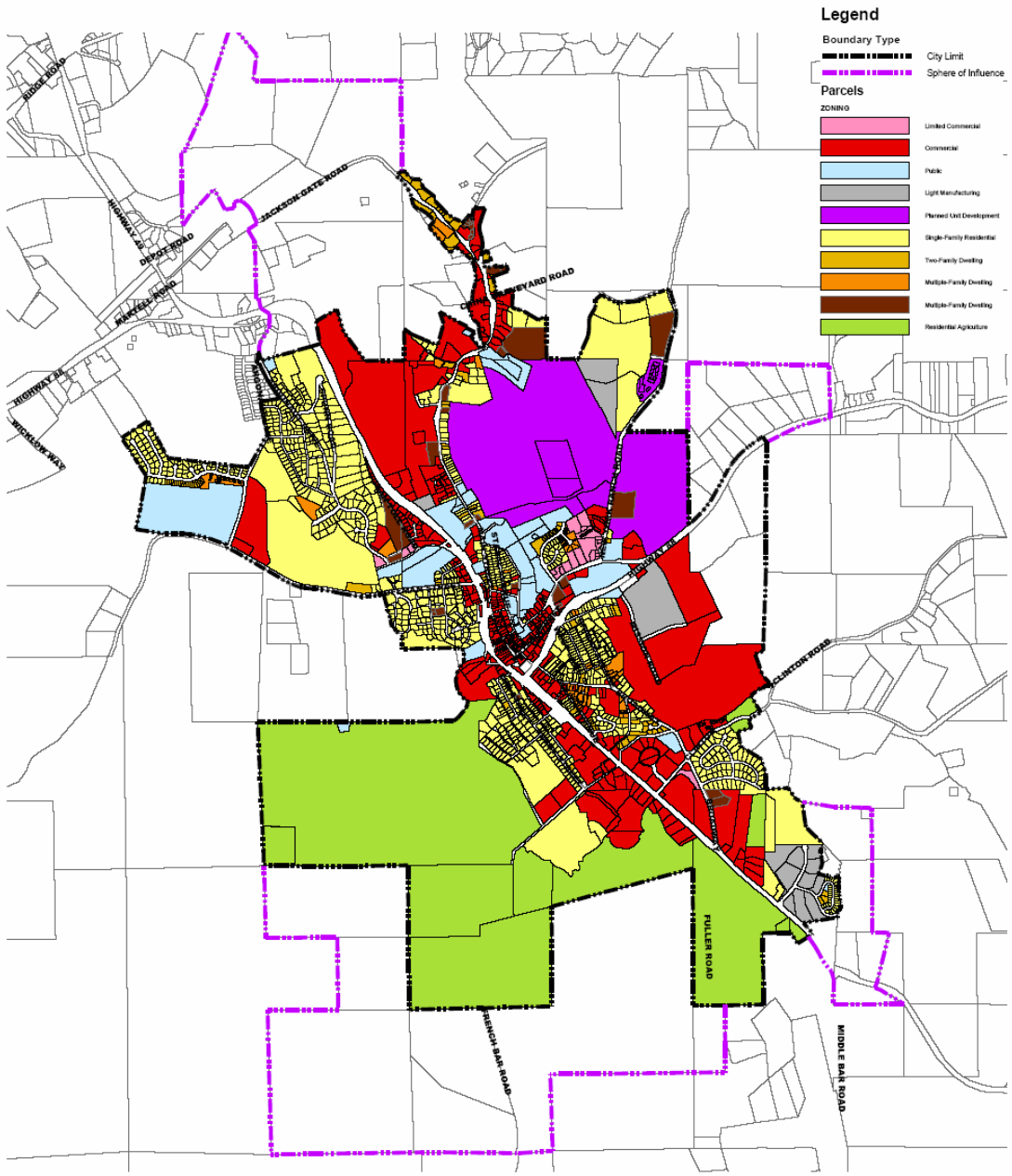
Single-Family Residential Units	774
Multi-Family Residential Units	211
Commercial	373,500 square feet
Office Space	70,000 square feet
Industrial	117,000 square feet
Public/Institutional	25,000 square feet

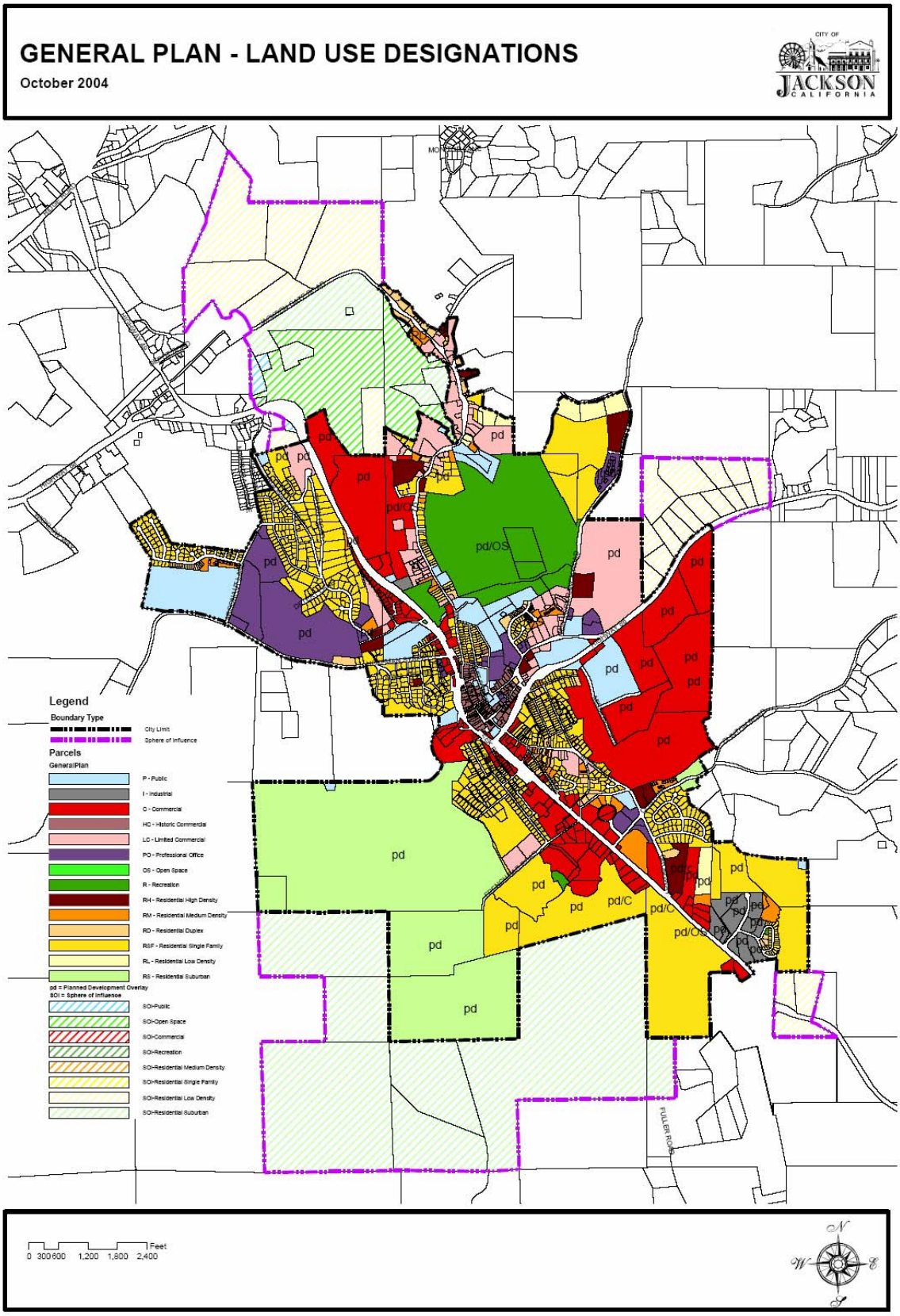
Areas targeted for future development include those areas identified on the following Land Use Designation Maps. The first map shows the existing zoning. The "(pd)" designation in the second map applies to lands that are largely undeveloped where planned unit developments or neighborhood developments are encouraged. The following maps show the existing zoning and planned land use designations for future development within the City limits.

EXISTING ZONING

AUGUST 2003

CITY OF JACKSON CALIFORNIA




GENERAL PLAN - LAND USE DESIGNATIONS
October 2004
CITY OF JACKSON CALIFORNIA
Legend
Boundary Type
City Limit
Sphere of Influence
Parcels
GeneralPlan
P - Public
I - Industrial
C - Commercial
HC - Historic Commercial
LC - Limited Commercial
PO - Professional Office
OS - Open Space
R - Recreation
RH - Residential High Density
RM - Residential Medium Density
RD - Residential Duplex
RSF - Residential Single Family
RL - Residential Low Density
RS - Residential Suburban
pd = Planned Development Overlay
SOI = Sphere of Influence
SOI-Public
SOI-Open Space
SOI-Commercial
SOI-Recreation
SOI-Residential Medium Density
SOI-Residential Single Family
SOI-Residential Low Density
SOI-Residential Suburban
pd
pd/OS
pd/C
FULLER ROAD
0 300 600 1,200 1,800 2,400 Feet
N
W
E
S

It is also important to note the City's 2004 Land Use Element provides for three overlay land use designations for the purpose of providing extra protection to sensitive areas. The overlay designations provide additional development requirements to properties located within overlay areas beyond the requirements of the base or combined land use designation. The three overlay land use designations include:

- Creek/Floodplain Overlay – the boundary of this Overlay is contiguous with current FIRMs for the City. The purpose of this overlay is to promote open space along the City's numerous creeks, to encourage public use of many of the creeks, and to discourage development in areas designated as a floodplain.
- Visual Corridor Overlay – the purpose of this Overlay is to protect the scenic views as one enters the City of Jackson from both the north and south of town. Development is not restricted in these areas, but incorporates development guidelines to promote development in an aesthetically pleasing manner.
- Historic Corridor Overlay – The purpose of this Overlay is to protect historic features which exist within the City. The Overlay is generally applied to primarily residential areas with a great amount of historic structures.

Vulnerability to Flood

Flooding is a significant hazard to the City of Jackson with certain areas of the city included in the currently defined 100-year floodplain: The Jackson Creek watershed has a drainage area of 33.9 square miles. The watershed is located on the western foothills of the Sierra Nevada Mountains. Elevations along the drainage divide vary from 2,700 feet at the headwater of the South Fork of Jackson Creek to 1,180 feet at the downstream end of the area. Major drainages traversing through the City include:

- Jackson Creek
- North Fork Jackson Creek
- South Fork Jackson Creek
- New York Ranch Creek
- Oneida Creek
- Middle Fork Jackson Creek

Flood History

Flooding occurs in the City of Jackson from periods of intense, generally short-duration rainfall on ground that has been previously saturated. The flood problems experienced by the City of Jackson have been minor in nature, creating inconvenience rather than major damage. The major source of flooding in the City of Jackson is associated with the following areas:

- Jackson Creek – from approximately 600 feet downstream from State Highway 49 and 88 to a point approximately 1,150 feet upstream of State Highway 88.

- North Fork Jackson Creek – from its confluence with Jackson Creek to a point approximately 90 feet upstream of Stark Lane
- South Fork Jackson Creek – from its confluence with Jackson Creek to a point approximately 3,200
- New York Ranch Creek – from its confluence with Jackson Creek to Court Street.

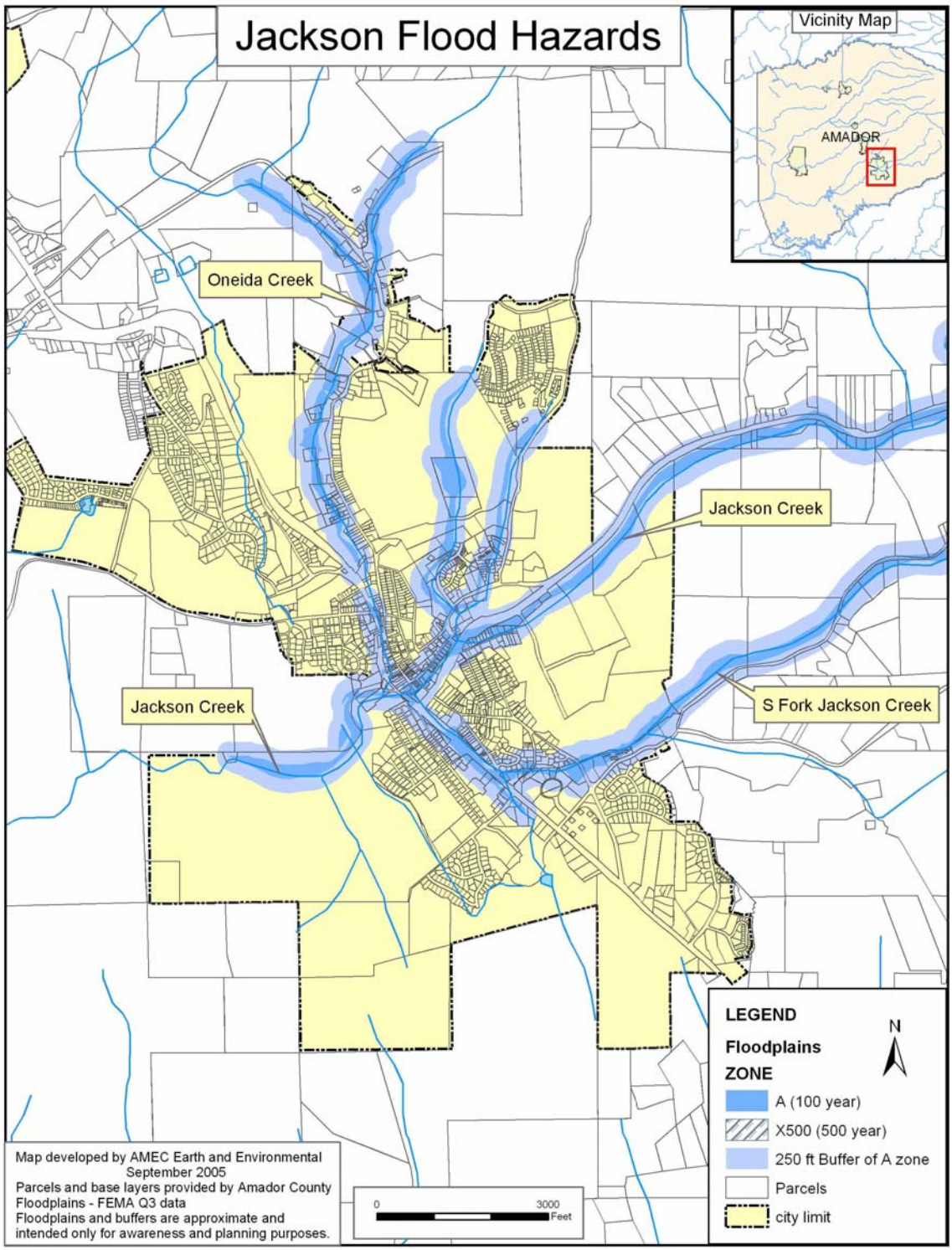
The creek areas most susceptible to flooding are along the South Fork near the Marcucci Lane culvert and the Middle Fork between the State Route 49/88 and Pitt Street.

Flood Protection Measures

There are no major flood control structures existing or planned for the portions of any streams included in this study. Localized modifications including channelization, floodwall, channel clearing, and slope protection installation have been implemented in conjunction with road and building construction.

Assets/Values at Risk

The map on the following page intersects the City of Jackson's parcel data with FEMA's Q3, 100-year floodplain data. Using this data, the value of parcels falling within the 100-year floodplain was quantified and is included in the table that follows.



MAP OF CITY OF JACKSON FLOODPLAIN

(Map Compilation: AMEC Earth & Environmental; Source Data:FEMA's Q3 data/Amador County Assessor)

CITY OF JACKSON 100-YEAR FLOODPLAIN VALUES AT RISK*						
Property Type	**Units Improved**	**Totals Improved**	**Units Vacant**	**Totals Vacant**	**Grand Totals**	
					Units	**$$**
Residential	417	$71,340,339	97	$2,113,908	**514**	**$73,454,247**
Commercial	130	$87,259,786	27	$1,602,639	**157**	**$88,862,425**
Industrial	0	$9	0	$0	**0**	**$0**
Agricultural	1	$461,659	2	$11,784,221	**3**	**$12,245,880**
Total Value	**548**	**$159,061,784**	**126**	**$15,500,768**	**674**	**$174,562,552**
*Values based on assessed value						

Application of the 20% damage factor to the above values at risk for improved parcels of $159,061,784, results in $31,812,357 at risk of damage to the 100-year flood.

Insurance Coverage, Claims Paid, and Repetitive Losses

The City of Jackson joined the NFIP on August 19, 1985. The following table identifies the existing FIRM map for the City of Jackson.

CITY OF JACKSON	
Map Number	**Effective Date**
0604480001D	07/17/1997

NFIP Insurance data indicates that as of 09/20/2005, there are 52 flood insurance policies in the City of Jackson resulting in $8,509,400 in Insurance in Force. Of these, 41 are located in the A, & AE Zones; 11 are located in the B, C, & X Zones. Historically, there have been 18 claims for flood losses totaling $156,195. Of these 18 claims, 13 were for properties located in the A & AE Zones; 1 was a preferred policy located in the B, C, and X Zone. All 14 claims were for pre-FIRM buildings.

The four additional claims were for RL properties located within the A & AE Zone. These four RL, totaling $92,564.96, were associated with two properties.

Analyzing this data, the City of Jackson has significant assets at risk to the 100-year and greater floods. Of the 548 improved parcels located within the 100-year floodplain, only 41 of those parcel owners maintain flood insurance. This equates to only 7.5% of those living within the 100-year floodplain having insurance coverage in the event of a 100-year flood. Note that there are an additional 11 policy holders for parcels outside of the 100-year floodplain.

The following inventories identify other assets at risk to the flood hazard in City of Jackson.

Critical Facilities

- Jackson Fire Department (within 250 feet of 100 year floodplain)
- Jackson Civic Center (within 250 feet of 100 year floodplain)
- Amador County Sheriff (within 250 feet of 100 year floodplain)
- Sutter Amador Hospital (within 250 feet of 100 year floodplain)

Cultural Resources

- South end of Historic Downtown Jackson district

Development Trends

New development is built according to the local floodplain management ordinance and should not be affected by flooding. In addition to requirements for new construction being built to the base flood (100-year) elevation, there are requirements for maintaining elevation certificates and implementing stormwater program elements and erosion or sediment controls for all new development within the floodplain.

Vulnerability to Wildfire

Fire is a significant concern to the City of Jackson. Historic fires have occurred in and around the County for decades. Significant historical fires in and around the City of Jackson area include the 1862 fire that destroyed downtown.

According to the Amador County Fire Hazard Reduction Plan, the area encompassing the City of Jackson is located within the Jackson Administrative Unit. The Unit is dominated by grasslands and chapparral interspersed throughout the Unit, with chaparral and dormant brush areas becoming more dominant at higher elevations. The City of Jackson is located in the middle of the Unit and is surrounded mostly by grasslands. The Mokelumne River flows along the southern boundary of the unit, and Jackson creek flows through the center of the City of Jackson, continuing through the entire Unit. Elevations range from approximately 500 feet to 2400 feet above sea level. According to the County-wide Fire Threat Map included on page 156 of this plan, fire threat is Very High throughout the entire Unit, especially along the Mokelumne River.

Assets/Values at Risk

Using the Fire Threat Map on page 157, in conjunction with County Assessor data, the values of identified parcels at risk within the mapped fire risk categories in the City of Jackson were determined and presented in the table that follows.

CITY OF JACKSON Residential Values at Risk to Wildfire		
Number of Improved Residential Structures	**Average Assessed Value**	**Total Average Assessed Value of Residential Structures**
417	$171,080	$71,340,360

Vulnerability to Other (Non-Mapped) Hazards: Avalanches, Agricultural Hazards, Dam Failure, Drought, Earthquakes, Landslides, Natural Health Hazards, Severe Weather, Volcanoes

Except for those mapped hazards, flood and wildfire, the risk assessment for this plan, as previously described, covers the entire geographical extent of the County-wide Planning Area. Thus, the risk assessment for the County also includes and directly corresponds to the unincorporated portions of the County and all incorporated jurisdictions, including the City of Jackson.

CITY OF PLYMOUTH

Population: 957 (2000 Census)
Area: 1.41 square miles
Elevation: 1086 feet above msl

Background

Located on historic Highway 49, Plymouth is in the heart of Gold Country located 30 miles east of Sacramento. At 1086 feet above sea level, the town of Plymouth is at the north end of Amador County.

Plymouth dates from 1852 when mining prospectors established a camp (Pokerville), before moving a mile to the permanent Puckerville in 1855. The name Plymouth was used for the first time a year later for a quartz mill, while the settlement itself became Plymouth in 1871, named after the Plymouth Mine Company, a gold mining concern. The last of the mines closed in the late 1940s, and today, Plymouth City, the "Gateway to the Shenandoah Valley", is renowned for its wine production.

Hazard Summary

Based on information provided by the City of Plymouth, a hazard summary for the City is provided below.

SUMMARY HAZARD ANALYSIS: CITY OF PLYMOUTH				
Hazard	**Frequency of Occurrence**	**Spatial Extent**	**Potential Magnitude**	**Significance**
Avalanches	Unlikely	Limited	Negligible	Low
Dam Failure	Unlikely	Limited	Negligible	Low
Drought	Occasional	Extensive	Critical	Medium
Earthquakes	Unlikely	Extensive	Catastrophic	High
Floods	Likely	Limited	Critical	High
Hail	Likely	Significant	Negligible	Low
Heavy Rains/Lightning	Likely	Extensive	Catastrophic	High
High Winds	Likely	Limited	Negligible	Low
Landslides	Unlikely	Limited	Negligible	Low
Natural Health Hazards	Highly Likely	Significant	Catastrophic	Low

SUMMARY HAZARD ANALYSIS: CITY OF PLYMOUTH				
Tornados	Unlikely	Limited	Negligible	Low
Wildfires	Likely	Significant	Catastrophic	High
Winter Storms	Highly Likely	Extensive	Catastrophic	High

Guidelines:

Frequency of Occurrence
Highly Likely: Near 100% probability in next year.
Likely**:** Between 10 and 100% probability in next year, or at least one chance in ten years.
Occasional**:** Between 1 and 10% probability in next year, or at least one chance in next 100 years.
Unlikely**:** Less than 1% probability in next 100 years.

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

Potential Magnitude
Catastrophic**:** More than 50% of area affected
Critical**:** 25 to 50%
Limited: 10 to 25%
Negligible**:** Less than 10%

Significance (Your subjective opinion)—***Low***, ***Medium***, ***High***

Vulnerability Assessment

The following sections show the total value of property and key inventories at risk within the City of Plymouth.

Assets/Values at Risk

Utilizing Amador County assessor data, the total assessed values for the City of Plymouth are:

CITY OF PLYMOUTH
2005 Roll Values

Property Type	Units Improved	Totals Improved	Units Vacant	Totals Vacant	Grand Totals	
					Units	$$
Residential	383	$43,144,224	105	$1,971,528	**488**	**$45,115,752**
Commercial	45	$9,421,461	15	$758,523	**60**	**$10,179,984**
Industrial	0	$0	0	$0	**0**	**$0**
Agricultural	5	$2,720,791	0	$0	**5**	**$2,720,791**
Total Value	**433**	**$55,286,476**	**120**	**$2,730,051**	**553**	**$58,016,527**

Critical Facilities Inventory

Utilizing the definition of critical facilities previously set forth in this Plan, the critical facilities in the City of Plymouth are listed below.

- Plymouth Volunteer Fire Department
- Sutter-Amador Health Clinic
- American Legion Ambulance Facility
- Plymouth Elementary School

Cultural and Natural Resources at Risk

Cultural and natural resources in City of Plymouth include those previously identified in the County inventory and as detailed below:

Cultural Resources

- Plymouth Trading Post
- House, Plymouth
- Amador County ?????
- Masonic lodge Temple
- Lodge Hill – Odd Fellows Lodge
- Old China Store
- St. Mary's of the Mountain Catholic Church
- The Ross Building???
- Plymouth Hotel
- The Empire Store
- Native Sons Well

Development Trends

According to the 2004-2009 Housing Element of the Amador County General Plan, growth in the City of Plymouth has occurred at a substantial rate. From 1990 to 2000, there was a 20.8% increase in population from 811 to 980. The County average growth rate is 16.8% for that same time.. Growth projections for the City indicate an annual growth rate of 2-4% over the next 15 years.

Vulnerability to Flood

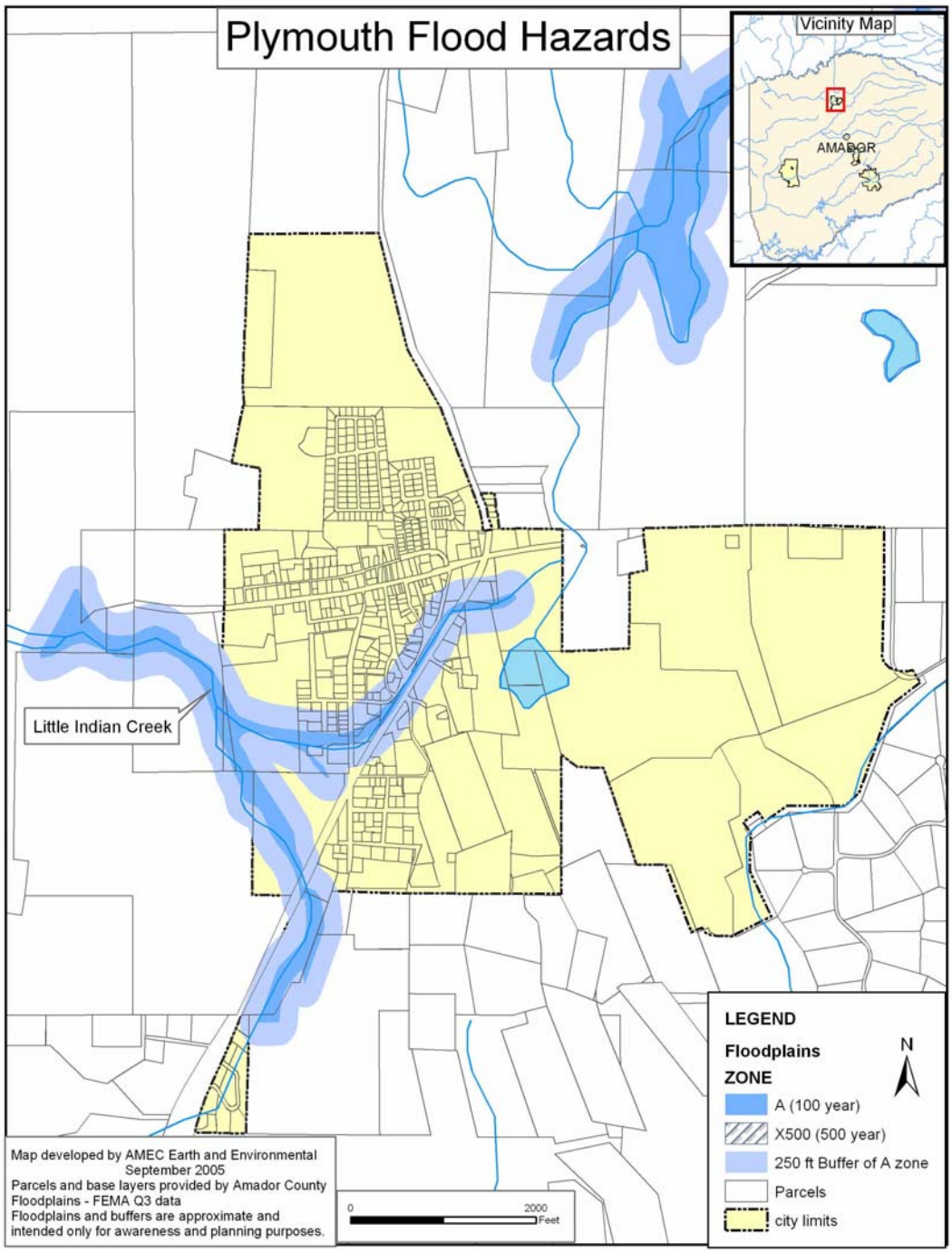
Flooding is a concern to the City of Plymouth with certain areas of the city included in the currently defined 100-year floodplain: The major source of flooding in the City of Plymouth, is associated with Little Indian Creek, which runs through the City. According to the City Engineer, most of the flooding is due to an inadequate storm drainage system. The system was not designed to handle flooding associated with heavy storms during the winter and spring seasons.

Flood History

The flood history for the City of Plymouth includes flooding associated with flood events previously described for the County.

Assets/Values at Risk

The map on the following page intersects the City of Plymouth's parcel data with FEMA's Q3, 100-year floodplain data. Using this data, the value of parcels falling within the 100-year floodplain was quantified and is included in the table that follows.



MAP OF CITY OF PLYMOUTH FLOODPLAIN

(Map Compilation: AMEC Earth & Environmental; Source Data:FEMA's Q3 data/Amador County Assessor)

CITY OF PLYMOUTH 100-YEAR FLOODPLAIN VALUES AT RISK						
Property Type	Units Improved	Totals Improved	Units Vacant	Totals Vacant	Grand Totals	
					Units	$$
Residential	48	$5,962,409	21	$282,446	**69**	**$6,244,855**
Commercial	13	$3,999,950	3	$411,443	**16**	**$4,411,393**
Industrial	0	$0	0	$0	**0**	**$0**
Agricultural	0	$0	0	$0	**0**	**$0**
Total Value	**61**	**$9,962,359**	**24**	**$693,889**	**85**	**$10,656,248**

*Values based on assessed value

Applying the 20% damage factor to the above values at risk for improved parcels of $9,962,359, results in $1,992,471 at risk of damage to the 100-year flood.

Insurance Coverage, Claims Paid, and Repetitive Losses

The City of Plymouth joined the NFIP on December 1, 1990. The following table identifies the existing FIRM maps for the City of Plymouth.

CITY OF PLYMOUTH		
Map Number	**Document Type**	**Effective Date**
0604559999A	Conversion Letter	12/01/1990
060455A	FIRM	12/01/1990

NFIP Insurance data indicates that as of 09/20/2005, there are two flood insurance policies in the City of Plymouth resulting in $379,000 in Insurance in Force. Of these, one is located in the A Zone; one is a preferred policy located in the B, C, & X Zones. Both policies are for pre-Firm structures. Historically, there have been no claims for flood losses within the City limits.

Analyzing this data, the City of Plymouth has significant assets at risk to the 100-year and greater floods. Of the 61 improved parcels located within the 100-year floodplain, only one of those parcel owners maintain flood insurance. This equates to only 2.1% of those living within the 100-year floodplain having insurance coverage in the event of a 100-year flood. Note that there is one additional policy holder for a parcel located outside of the 100-year floodplain.

Development Trends

New development is built according to the local floodplain management ordinance and should not be affected by flooding. In addition to requirements for new construction being built to the base flood (100-year) elevation, there are requirements for maintaining elevation certificates and implementing stormwater program elements and erosion or sediment controls for all new development within the floodplain.

Vulnerability to Wildfire

Fire is a significant concern to the City of Plymouth. Historic fires have occurred in and around the County for decades. Significant historical fires in the Plymouth area include:

- 1961 Fire

According to the Amador County Fire Plan, the area encompassing the City of Plymouth is located within the Plymouth Administrative Unit. The Unit is located in the northwest corner of the County adjacent to the Consumnes River and the Sacramento County line. Elevations range from approximately 300 feet to 1,500 feet above sea level. The terrain is relatively gentle with rolling hills and is dominated by grasslands. The City of Plymouth is located in the Southeast portion of the Unit. The County-wide Fire Threat Map included on page 157 of this plan, identifies the city in a area of High to Very High Threat.

Assessor Data: Assets/Values at Risk

Using the Fire Hazard Severity Zone Map, in conjunction with County Assessor data, the values of identified parcels at risk within the mapped fire risk categories in the City of Plymouth were determined and presented in the table below.

CITY OF PLYMOUTH RESIDENTIAL VALUES AT RISK TO WILDFIRE		
Number of Improved Residential Structures	**Average Assessed Value***	**Total Average Assessed Value of Residential Structures**
48	$124,217	$5,962,416

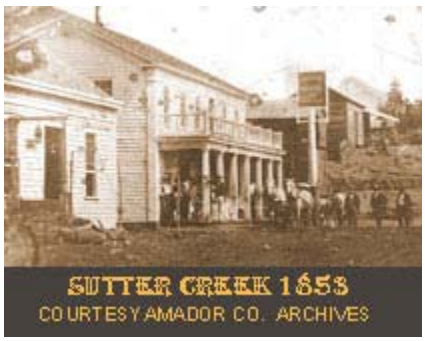
Vulnerability to Other (Non-Mapped) Hazards: Avalanches, Agricultural Hazards, Dam Failure, Drought, Earthquakes, Landslides, Natural Health Hazards, Severe Weather, Volcanoes.

Except for those mapped hazards, flood and wildfire, the risk assessment for this plan, as previously described, covers the entire geographical extent of the County-wide Planning Area. Thus, the risk assessment for the County also includes and directly corresponds to the unincorporated portions of the County and all incorporated jurisdictions, including the City of Plymouth.

CITY OF SUTTER CREEK

Population: 2,342 (2000 Census)
Area: 1.57 square miles
Elevation: 1198 feet above msl

Background



Sutter Creek, an historic gold country town, located in the heart of Amador County incorporated in 1854. Sutter Creek, known as the "Jewel of the Mother Lode," was named after John Sutter, who sent a party to the area in 1846 in search of timber. His discovery of gold at nearby Coloma triggered the California Gold Rush and Sutter Creek also became a destination for fortune hunters, although Sutter himself only visited the mining camp once. Although plenty of gold was found here, quartz was discovered in 1851 and that became the mainstay of the local economy for many years. In 1932 the Central Eureka mine, discovered in 1869, had reached the 2,300-foot level. By 1939, it was the best-paying mine at Sutter Creek.

With the prosperity brought by quartz mining, Sutter Creek became a boom town. Many of the original brick buildings are still standing, as well as some of the mansions built by the wealthier residents. Leland Stanford was one of Sutter Creek's most famous residents.

The mines continued operations until the 1950s. Today, Sutter Creek is a tourist town with many shops and restaurants. The town itself is registered as California Registered Landmark #322.

Hazard Summary

Based on information provided by the City of Sutter Creek, a hazard summary for the City is provided on the following page.

SUMMARY HAZARD ANALYSIS: SUTTER CREEK				
Hazard	**Frequency of Occurrence**	**Spatial Extent**	**Potential Magnitude**	**Significance**
Avalanches	Unlikely	Limited	Negligible	Low
Dam Failure	Unlikely	Limited	Negligible	Medium
Drought	Occasional	Extensive	Critical	Low
Earthquakes	Unlikely	Extensive	Catastrophic	High
Floods	Likely	Significant	Critical	High
Hail	Likely	Significant	Negligible	Low
Heavy Rains/Lightning	Likely	Extensive	Catastrophic	High
High Winds	Unlikely	Limited	Negligible	Low
Landslides	Likely	Limited	Negligible	Low
Natural Health Hazards	Highly Likely	Significant	Negligible	Low
Tornados	Unlikely	Limited	Negligible	Low
Wildfires	Likely	Significant	Catastrophic	High
Winter Storms	Highly likely	Extensive	Catastrophic	Medium

Guidelines:

Frequency of Occurrence
Highly Likely: Near 100% probability in next year.
Likely**:** Between 10 and 100% probability in next year, or at least one chance in ten years.
Occasional**:** Between 1 and 10% probability in next year, or at least one chance in next 100 years.
Unlikely**:** Less than 1% probability in next 100 years.

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

Potential Magnitude
Catastrophic**:** More than 50% of area affected
Critical**:** 25 to 50%
Limited: 10 to 25%
Negligible**:** Less than 10%

Significance (Your subjective opinion)—***Low***, ***Medium***, ***High***

In addition, the City provided historic incident information for the following types of events impacting the City of Sutter Creek.

- Floods (1986, 1995, 1997, 1998)
- Fires (1964, smaller, annual fires)

Details are provided in Hazard-specific sections as appropriate.

Vulnerability Assessment

The following sections show the total value of property and key inventories at risk within Sutter Creek.

Assets/Values at Risk

Utilizing Amador County assessor data, the total assessed values for Sutter Creek are:

CITY OF SUTTER CREEK 2005 Roll Values						
Property Type	**Units Improved**	**Totals Improved**	**Units Vacant**	**Totals Vacant**	**Grand Totals**	
					Units	**$$**
Residential	970	$172,990,515	203	$11,111,380	**1173**	**$184,101,895**
Commercial	103	$43,346,894	22	$4,877,631	**125**	**$48,224,525**
Industrial	1	$397,237	0	$0	**1**	**$397,237**
Agricultural	0	$0	1	$1,842,095	**1**	**$1,842,095**
Total Value	**1,074**	**$216,734,646**	**226**	**$17,831,106**	**1,300**	**$234,565,752**

Critical Facilities Inventory

Utilizing the definition of critical facilities previously set forth in this Plan, the critical facilities in the City of Sutter Creek are listed below.

- Sutter Creek Auditorium (City Hall, Public Works, Building & Police Departments): 1 Building, $1,500,000 replacement value
- Sutter Creek Community Center: 1 Building, $2,000,000
- Sutter Creek Sewer Treatment Plant: &7,600,000
- Sutter Creek Sewer Plant: 3 Buildings, $2,000,000 replacement value
- Sutter Crest East Sewer Pump Station: $400,000
- SBC Telephone Switching: 1 Building, $500,000 replacement value
- Sutter Creek Fire Departments: 2 Buildings, $3,500,000 replacement value
- Four school sites: 20 Buildings, $90,000,000 replacement value

- One daycare center: 1 Building, $400,000 replacement value
- Main Street/Hwy 49 Bridge (over Sutter Creek): $800,000 replacement value
- Badger Street Bridge (over Sutter Creek: $500,000 replacement value
- Sutter Creek Sewerlines (adjacent to/under Sutter Creek): $1,000,000 replacement value
- ARSA pipeline, Henderson Reservoir, Preston Reservoir and Preston Forebay: $20,000,000 replacement value
- Sutter Creek footbridge: $110,000 replacement value
- Minnie Provis park and ballfield: $1,000,000 replacement value

Cultural and Natural Resources at Risk

Cultural and natural resources in the City of Sutter Creek include those previously identified in the County inventory and as detailed below:

Cultural Resources

- Town of Sutter Creek (Landmark)
- Knights Foundry and Shops
- Sutter Creek Grammar School
- Central Eureka Mine Stamp Mill and Headframe Powder House Estates (Powder house building, Wildman Mine Office and Rock Cabin)
- Powder House building at gopher flat road parking lot near post office
- Powder House building on Eureka street
- Powder House on Eureka street above Flushing Dam
- Flushing Dam on Eureka Street
- All homes and buildings in the historical corridor (located the length of Main Street from Dennis Street on the south to North Amelia Street on the North. It widens to include all neighborhoods along Badger Street and all neighborhoods as far east as Mill Street, Cole Street and the length of Eureka Street, excluding newer homes in the area.)
- Sutter Creek Theater
- The Palace
- Bellotti's/American Exchange Hotel
- Leland Stanford's Home
- The Catholic Church and Cemetery
- City Cemetery
- Odd-fellows Cemetery

Natural Resources

Natural resources of significance to the City include Sutter Creek, open space areas, and the Oak forests found on surrounding hillsides.

Development Trends

According to the 2004-2009 Housing Element of the Amador County General Plan, the City of Sutter Creek is growing faster than growth rate in other incorporated communities and the County. From 1990 to 2000, there was a 25.5.% increase in population from 1,835 to 2,303. The County average growth rate is 16.8%.

There are approximately 400 new housing units approved in the City with about 50 units currently being developed or built. In addition, Gold Rush Ranch and Resort has applied for 1335 units of housing, but this development is currently pending CEQA and planning review.

Growth projections indicate that the city will continue to outpace the County's average growth rate. However, the political climate may be changing and some infrastructure constraints (i.e., sewer and potable water capacity) may begin to affect this trend in the coming years.

Vulnerability to Flood

Flooding is a significant hazard to the City of Sutter Creek with certain areas of the city included in the currently defined 100-year floodplain: The major source of flooding in the City is associated with Sutter Creek, which traverses east to west through the community. There are four creeks that feed into Sutter Creek. The flooding issues associated with each of these creeks are described below.

One creek begins in the area of Old Sutter Hill Road and travels down Bryson, then along highway 49 to Raylan Drive where it crosses the highway and cuts back east to join Sutter Creek at Badger St. between Karsan Drive and Allen Ranch Road. This creek was the focus of a major Hazard Elimination Project in 2000 and has not been a problem since then.

The second creek begins up Gopher Flat Road and follows it as an open creek until it reaches Cole Street After this point, it travels in a culvert all the way under Main Street, along Hayden Alley, and finally across a residential lot until it reaches Sutter Creek. Historically, the culvert between Cole Street and Main Street has been too small. The City did a drainage project in1998 that corrected much of the problem but a small section near Gopher Flat and Main Street could not be corrected due to a dense greenstone rock section. The City decided to reduce the flow upstream via a diversion at Manor Court or via a new drainage pipe along Broad St. Neither of these projects has yet been completed.

The third creek begins near the Sutter Creek Fire Hall at the north end of the city and travels across Highway 49 to China Gulch. It travels behind the days in and meets the intersection of Badger Street/Spanish Street/North Amelia/Mahoney Mill Road. It goes into a culvert under this 5-way intersection and then into a ditch until it joins Sutter Creek next to the Badger Street

Bridge. This last culvert has proved to be too small in the past and has caused the creek to overflow. A hazard elimination grant has been filed but has been in the queue for several years. A development project in the area of the Sutter Creek fire hall may correct the problem by on-site retention but the project is not yet approved.

The last creek begins on Amador Road and travels along it to Amelia Street where it goes into pipe. This pipe runs down Amelia Street to Badger Street and then into a pipe that crosses the grounds of the Leland Stanford house (now owned by Aldo and Dorothy Pinotti). The City replaced the pipe across the Pinotti property in the 2003-2004 budget year. There has been any problems with this drainage since then.

Other localized flooding, outside of the 100-year floodplain, occurs due to drainage problems that restrict flows in the following areas:

- Bryson Drive undercrossing
- Bryson Creek Drainage near Badger Street, David Drive and Raylin Drive
- Old Sutter Hill Road between Old Eureka Road and Highway 49
- Gopher Gulch Creek along Gopher Flat Road between Manor Court and Sutter Creek
- Sutter Creek East drainage bypass to Sutter Creek Broad Street drainage
- Sutter Creek Cemetery and Mahoney Mill Road
- Oro Madre Road drainage between Oro Madre and Amador High School
- China Gulch drainage between the Sutter Creek Fire Hall and Badger Street
- Spanish Street Drainage from Amador City Road (String Bean Alley) and North Amelia Street
- Drainage on Fiefield Alley behind Belotti's Skunk Hollow gulch near Greenstone Terrace
- Drainage along Ridge Road between Highway 49 and Ampine Drive Drainage from the Amador airport and Old Sutter Hill Road

Flood History

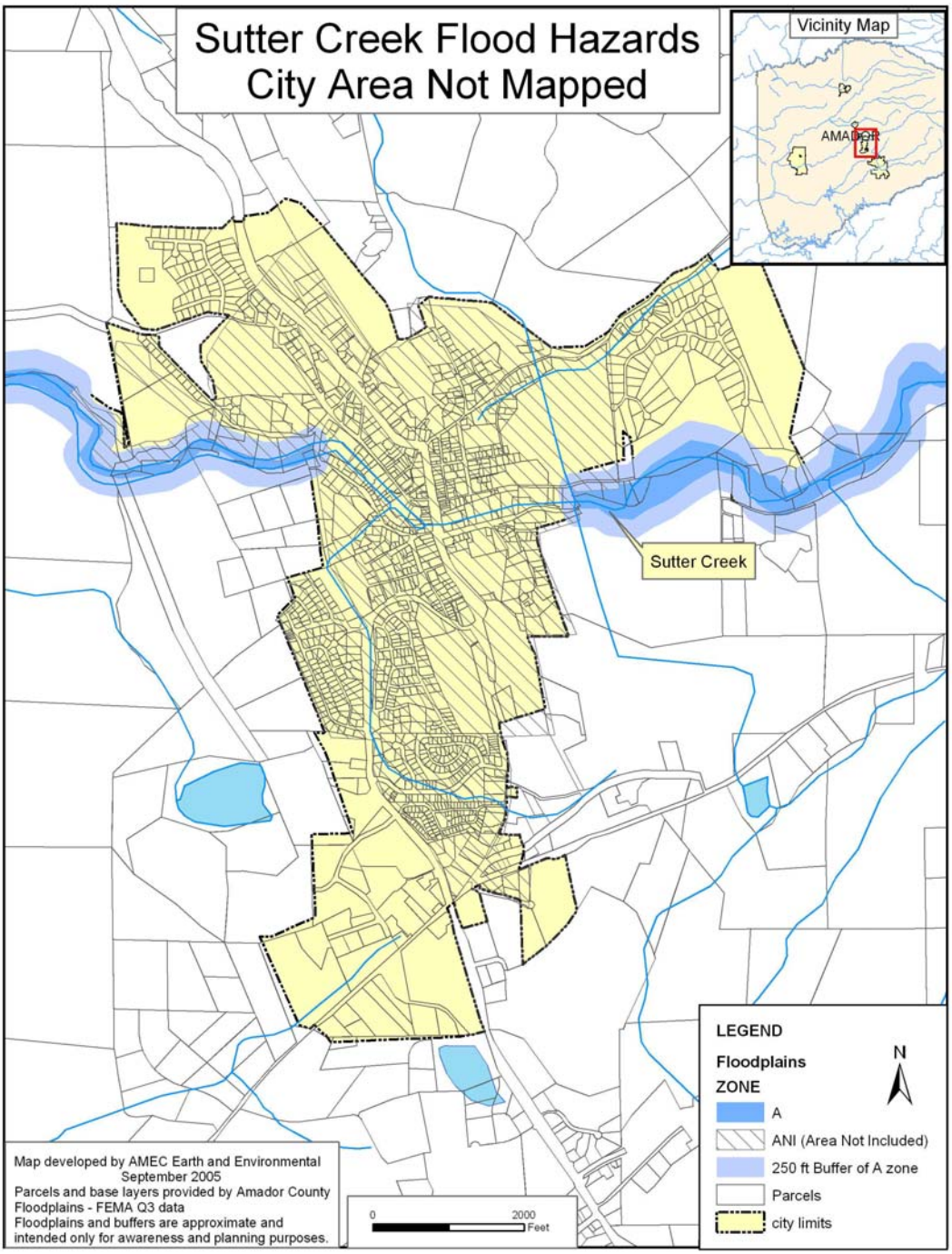
Documented flooding from Sutter Creek occurred in 1986, 1995, 1997, and 1998. In each instance, rain-waters have caused Sutter Creek to swell and exceed its bank capacity causing low-level flooding to adjacent structures. Flooding has occurred in buildings on both North and South banks between the end of Eureka Street and the Badger Street Bridge. Affected properties are located on Main Street (Hwy 49), Eureka Street, Badger Street, and Spanish Street. Historic flooding damage has been limited to property damage; no injuries or deaths have occurred. To the extent data was available, damages and impacts are described as follows:

- Property Damage: Extensive water/flood damage to building contents

- Structural Damage: Structural damage has occurred to residential and commercial buildings. Also, the 2997 flood uncovered and damaged City sewer system pipes/infrastructure.
- Business/Economic Impact: Some businesses, such as the Sutter Creek library, were closed for a period of time. Overall impact unknown.
- Road/School/Other Closures: The Badger Street Bridge is designed as an overflow bridge and therefore is routinely closed during high-water periods. The 1997 flood caused a short-term closure of Highway 49 Bridge over Sutter Creek.
- Federal/State Disaster Relief Funding: According to the City, FEMA funds were provided for the 1997 flood—amount unknown. Based on the California Plan, the following amount was provided to the City of Sutter Creek in response to Disaster Number 1008:
    - $311,250

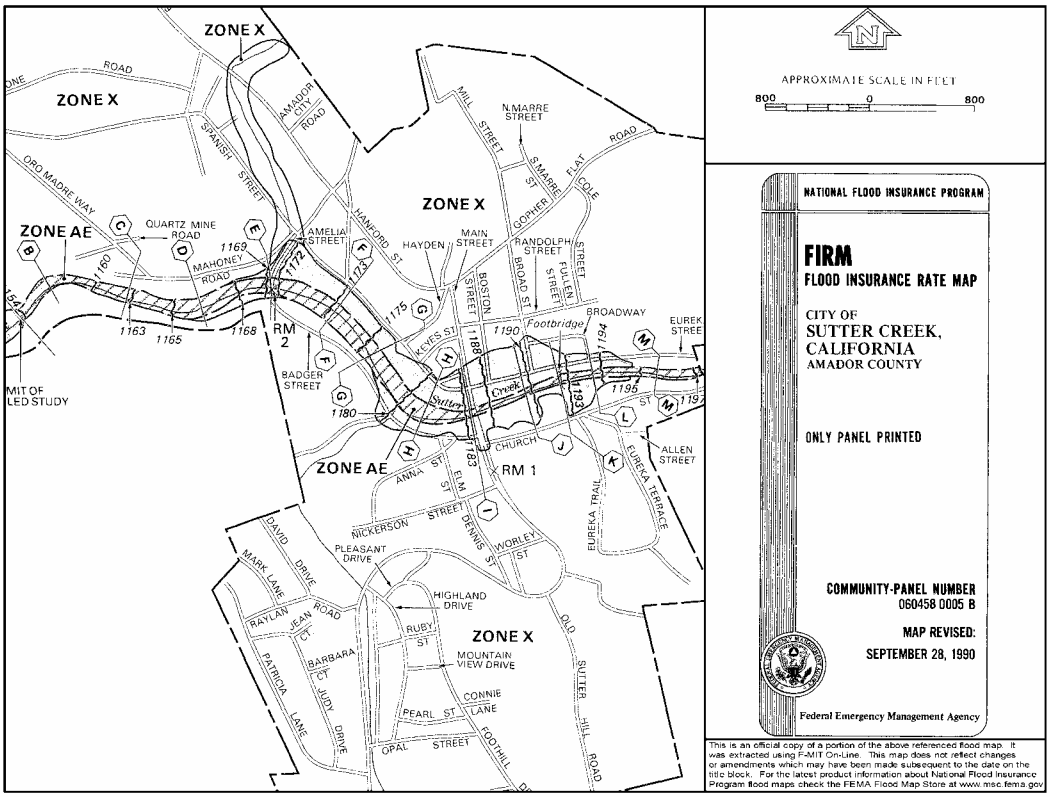
Assets/Values at Risk

The maps on the following pages intersect the City of Sutter Creek's parcel data with FEMA's 100-year floodplain data. However, because the floodplains were not available digitally for the center portion of Sutter Creek, the below analysis utilized available digital Q3 data (1st map) and a hard copy FIRM (2nd map) to create a digital estimate of where the floodplain is likely located, with a 250 foot buffer (3rd map). Using this data, the value of parcels falling within the 100-year floodplain was quantified and included in the table that follows.



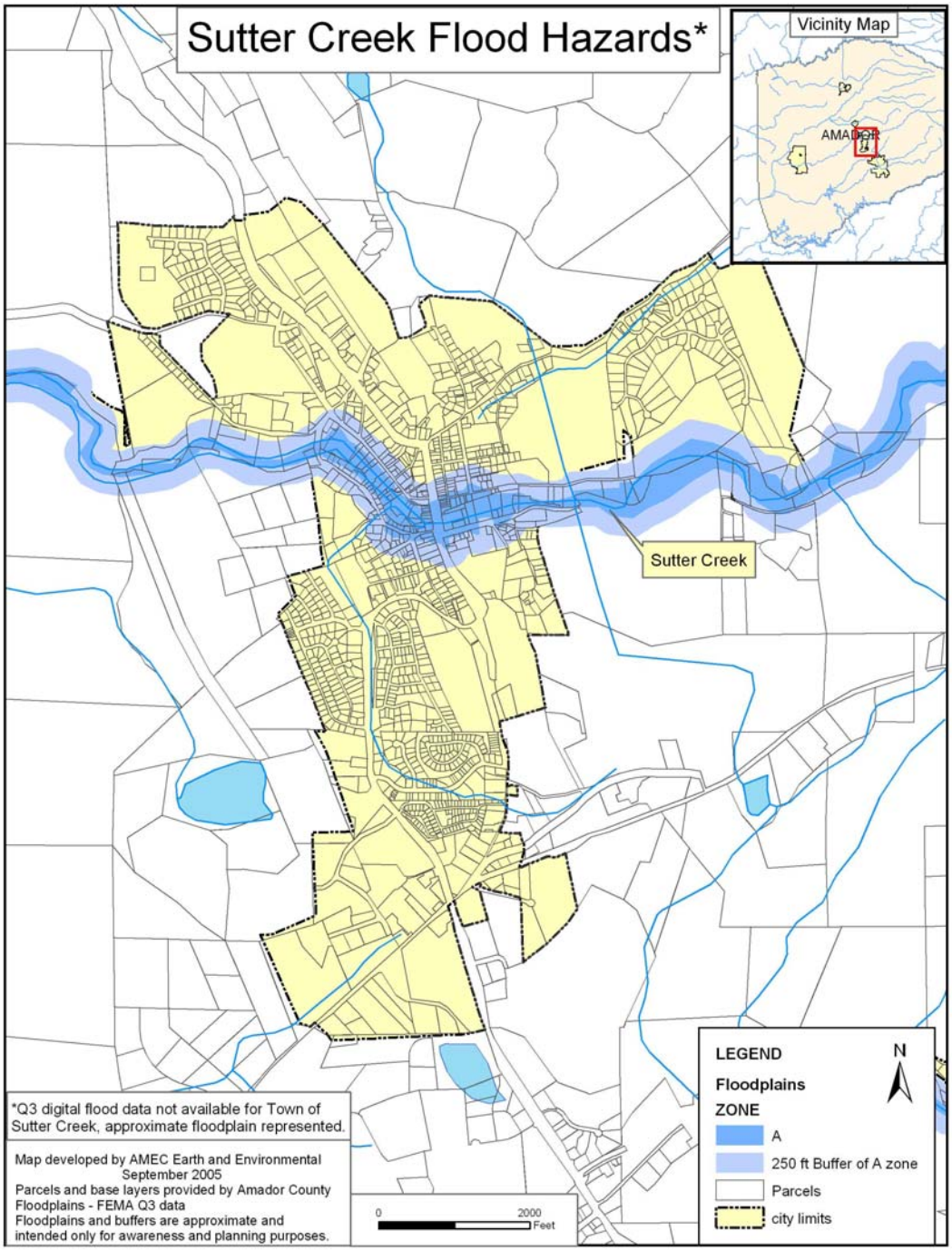
MAP OF CITY OF SUTTER CREEK FLOODPLAIN

(Map Compilation: AMEC Earth & Environmental; Source Data:FEMA's Q3 data/Amador County Assessor)



MAP OF CITY OF SUTTER CREEK FLOODPLAIN

(Map Compilation: AMEC Earth & Environmental; Source Data:FEMA's FIRM)



MAP OF CITY OF SUTTER CREEK FLOODPLAIN

(Map Compilation: AMEC Earth & Environmental; Source Data:FEMA's Q3 data & FIRM map/Amador County Assessor)

CITY OF SUTTER CREEK 100-YEAR FLOODPLAIN VALUES AT RISK*						
Property Type	**Units Improved**	**Totals Improved**	**Units Vacant**	**Totals Vacant**	**Grand Totals**	
					Units	**$$**
Residential	168	$27,279,623	31	$1,194,683	**199**	**$28,474,306**
Commercial	40	$8,813,969	0	$0	**40**	**$8,813,969**
Industrial	1	$397,237	0	$0	**1**	**$397,237**
Agricultural	0	0	1	$1,842,095	**1**	**$1,842,095**
Total Value	**209**	**$36,490,829**	**32**	**$3,036,778**	**241**	**$39,527,607**
*Values based on assessed value						

Applying the 20% damage factor to the above values at risk for improved parcels of $36,490,829, results in $7,298,166 at risk of damage to the 100-year flood.

Insurance Coverage, Claims Paid, and Repetitive Losses

The City of Sutter Creek joined the NFIP on September 24, 1984. The following table identifies the existing FIRM map for the City and a listing of Letter of Map Changes (LOMCs).

CITY OF SUTTER CREEK FIRM DATA		
Map Number	**Document Type**	**Effective Date**
0604580005B	FIRM	09/28/1990
00-09-405A-060458	LOMC	03/15/2000
98-09-1136A-060458	LOMC	12/23/1998
99-09-496A-060458	LOMC	03/25/1999
03-09-0678P-060458	LOMC	09/19/2003

NFIP Insurance data indicates that as of 09/20/2005, there are 23 flood insurance policies in the City of Sutter Creek resulting in $3,683,100 in Insurance in Force. Of these, 16 are located in the A & AE Zones; seven are located in the B, C, & X Zones. Historically, there have been nine claims for flood losses totaling $53,207. Six of these claims were for Pre-FIRM structures totaling $46,683,69; three in the A & AE Zones and three in the B, C, & X Zones. Two claims were for preferred policies for Post-FIRM structures located in the B, C, & X Zones. These last two claims were considered RL losses for one RL structure for a total of $3,872.98.

Analyzing this data, the City of Sutter Creek has significant assets at risk to the 100-year and greater floods. Of the 209 improved parcels located within the 100-year floodplain, only 16 of those parcel owners maintain flood insurance. This equates to only 7.7% of those living within the 100-year floodplain having insurance coverage in the event of a 100-year flood. Note that there are an additional seven policy holders for parcels outside of the 100-year floodplain.

The above information can be compared to the estimates of assets at risk conducted by the City of Sutter Creek. These assets are all located along Sutter Creek on Eureka Street, Church Street, Main Street (Hwy 49), Badger Street, and Spanish Street and include the following:

- 45 residential structures valued at $18,000,000
- Six commercial structures valued at $4,000,000
- Three industrial structures valued at $3,000,000

Also as provided by the City, there are approximately 100 residents in the historical flood affected areas.

Critical Facilities

- Sutter Creek Auditorium (City Hall, Public Works, Building & Police Departments): one building, $1,500,000 replacement value
- Sutter Creek Sewer Plant: three buildings, $2,000,000 replacement value
- Main Street/Hwy 49 Bridge (over Sutter Creek): $800,000 replacement value
- Badger Street Bridge (over Sutter Creek): $500,000 replacement value
- Sutter Creek Sewer lines (adjacent to/under Sutter Creek): $1,000,000 replacement value

Cultural Resources

Historical records maintained in the basement of the Sutter Creek Auditorium are subject to loss. In addition, the following historical resources are at risk to flooding:

- All historical homes along the west side of Eureka Street, the west side of Fiefield Alley, the west side of Spanish Street, and those along the east side of Badger Street
- The Flushing Dam along Eureka Street
- Sutter Creek Auditorium
- The Powder House in the City's Eureka Street parking lot

Natural Resources

The only known natural resources within the 100-year floodplain are the natural wetlands within the creekbed of Sutter Creek.

Development Trends

The portion of Sutter Creek within the flood hazard area is fully developed. Historically, the trend has been to build in the floodplain. Many of the buildings are historic, which limits the ability to retrofit or mitigate these structures from flood susceptibility.

Vulnerability to Wildfire

Fire is a significant concern to the City of Sutter Creek. Most of the properties within the City are susceptible to wildfire as the City is situated in a Canyon. Historic fires have occurred in and around the County for decades. Significant historical fires in the Sutter Creek area include:

- Approximately 1964 (actual date unknown): A wildland fire with structures involved occurred in the area, just northwest of Sutter Creek, from the city limits up to Amador High School area (330 Spanish Street). The extent of injuries and damages are unknown.
- Historically, MANY other relatively small grassfires (some with slight structural damage) have occurred in and around Sutter Creek for many years. Records of the exact locations and other details have not been maintained by the City.

Based on information provided by the Sutter Creek Police Department, a reoccurrence of this type of event is likely due to the increase in natural fuel sources (i.e., grass and other vegetation) within the Sutter Creek canyon area.

According to the Amador County Fire Plan, the area encompassing the City of Sutter Creek is located within the Sutter/Amador Administrative Unit. The Unit is located in the center of the County, bounded on the north by Dry Creek and extending south to the City of Sutter Creek. The Unit ranges in elevations from approximately 600 feet to 2,200 feet above sea level. Grasslands dominate the western half of the unit, transitioning into brush and chaparral vegetation further east. The County-wide Fire Threat Map included on page 157 of this plan, identifies the City predominantly in an area of Very High Threat.

Assessor Data: Assets/Values at Risk

Using the Fire Threat Map, in conjunction with County Assessor data, the values of identified parcels at risk within the mapped fire risk categories in the City of Sutter Creek were determined and presented in the table below.

CITY OF SUTTER CREEK
RESIDENTIAL VALUES AT RISK TO WILDFIRE

Number of Improved Residential Structures	Average Assessed Value	Total Average Assessed Value of Residential Structures	Median Market Value	Total Median Market Value of Residential Structures
970	$178,341	$172,990,770	$489,000	$47,433,000

The above information can be compared to the estimates of assets at risk conducted by the City of Sutter Creek. The City of Sutter Creek is situated in a canyon. As a result, most of the properties in the City are susceptible to wildfire. This includes the following:

- 600 residential structures valued at $200,000,000

- 80 commercial structures valued at $45,000,000
- 50 industrial structures valued at $35,000,000

Also as provided by the City, there are approximately 3,000 residents that would be affected by a worst-case scenario wildfire.

Critical Facilities

- Sutter Creek Auditorium (City Hall, Public Works, Building & Police Departments): One building, $1,500,000 replacement value
- Sutter Creek Community Center: One building, $2,000,000
- Sutter Creek Sewer Plant: Three buildings, $2,000,000 replacement value
- SBC Telephone Switching: One building, $500,000 replacement value
- Sutter Creek Fire Departments: Two buildings, $3,500,000 replacement value
- Four school sites: 20 buildings, $90,000,000 replacement value
- One daycare center: One building, $400,000 replacement value

Cultural Resources

- As previously described, approximately 40 historic buildings are within the Sutter Creek city limits and are potentially at risk to the wildfire hazard

Natural Resources

- Sutter Creek (the waterway)
- Oak Forests
- Open Space areas

Development Trends

Natural landscape is conducive to wildfire. Development continues in these WUI areas and property owners routinely ignore "defensible space" recommendations.

Vulnerability to Other (Non-Mapped) Hazards: Avalanches, Agricultural Hazards, Dam Failure, Drought, Earthquakes, Landslides, Natural Health Hazards, Severe Weather, Volcanoes

Except for those mapped hazards, flood and wildfire, the risk assessment for this plan, as previously described, covers the entire geographical extent of the County-wide Planning Area. Thus, the risk assessment for the County also includes and directly corresponds to the unincorporated portions of the County and all incorporated jurisdictions, including the City of Sutter Creek.

AMADOR WATER AGENCY

Background

In 1959, the Amador Water Agency (AWA) was formed for the purpose of providing water and wastewater services to the residents of Amador County. The AWA is the main water supplier for the western portion of Amador County. The Agency has two sources of water: surface water and groundwater. Surface water accounts for approximately 97% of total supply. Groundwater in Amador County is severely limited due to the hard, impermeable bedrock that covers the majority of the County.

The primary source of consumptive water is the Mokelumne River which is supplied from rainfall and snowmelt from the Sierra Mountain Range. This water is diverted from the Tiger Creek afterbay or Lake Tabeaud forebay and then either it gravity flows or is pumped to AWA treatment plants. The Agency's two main water systems are the Amador Water System (AWS) and the Central Amador Water Project System (CAWP). The Agency supplies drinking water to the communities of Jackson, Ione, Sutter Creek, Amador City, Drytown, the communities along the Highway 88 corridor, and the Lake Camanche area. The agency is located on Ridge Road in Sutter Creek; however, their assets are located throughout the County and beyond.

Water Sources

The North Fork of the Mokelumne River, located in the California Sierra Nevada Mountains, is the primary source for the CAWP system, the AWS, and the PG&E Tiger Creek Powerhouse system. Water supplied from rainfall and snowmelt is stored in Tiger Creek Afterbay and gravity feeds to the PG&E Tiger Creek Powerhouse Memcor Plant where it is treated and serves the PG&E Conference Center. Water from the Tiger Creek Afterbay is also pumped to the Buckhorn Water Treatment Plant where it is treated and ready for use by the customers of Pine Grove, Pine Acres, Sunset Heights, Fairway Pines, Jackson Pines, Pioneer, Gayla Manor, Ranch House Estates, Pine Park East, Toma Lane, Sierra Highlands, Silver Lake Pines, Ridgeway Pines, Rabb Park, and Mace Meadows. Water from the Mokelumne River is also stored in Lake Tabeaud and conveyed by canal to the Tanner Water Treatment Plant where it is treated for use by the customers of Jackson, Sutter Creek, Amador City, and Drytown. The Ione Pipeline transports raw water from the Tanner Reservoir to the Ione Water Treatment Plant where it is

treated for use by customers of Ione. Our La Mel Heights customers get their water from a single well located in the La Mel Heights Subdivision and our Lake Camanche residents get their water from three wells located in the Lake Camanche area.

Hazard Summary

Based on information provided by the AWA, a hazard summary for the agency is provided below.

SUMMARY HAZARD ANALYSIS: AMADOR WATER AGENCY				
Hazard	**Frequency of Occurrence**	**Spatial Extent**	**Potential Magnitude**	**Significance**
Avalanches				
Dam Failure	Unlikely	Limited	Limited	
Drought	Likely	Limited	Limited	
Earthquakes				
Floods	Likely	Limited	Limited	
Hail				
Heavy Rains/Lightning				
High Winds				
Landslides				
Natural Health Hazards				
Tornados				
Wildfires	Likely	Significant	Limited	
Winter Storms	Likely	Significant	Limited	

Guidelines:

Frequency of Occurrence

Highly Likely: Near 100% probability in next year.

***Likely*:** Between 10 and 100% probability in next year, or at least one chance in ten years.

***Occasional*:** Between 1 and 10% probability in next year, or at least one chance in next 100 years.

***Unlikely*:** Less than 1% probability in next 100 years.

Spatial Extent

***Limited*:** Less than 10% of planning area

***Significant*:** 10-50% of planning area

SUMMARY HAZARD ANALYSIS: AMADOR WATER AGENCY				
Hazard	**Frequency of Occurrence**	**Spatial Extent**	**Potential Magnitude**	**Significance**
Extensive*:** 50-100% of planning area **Potential Magnitude** ***Catastrophic*:** More than 50% of area affected ***Critical*:** 25 to 50% ***Limited*:** 10 to 25% ***Negligible*:** Less than 10% **Significance** (Your subjective opinion)—Low***, ***Medium***, ***High***				

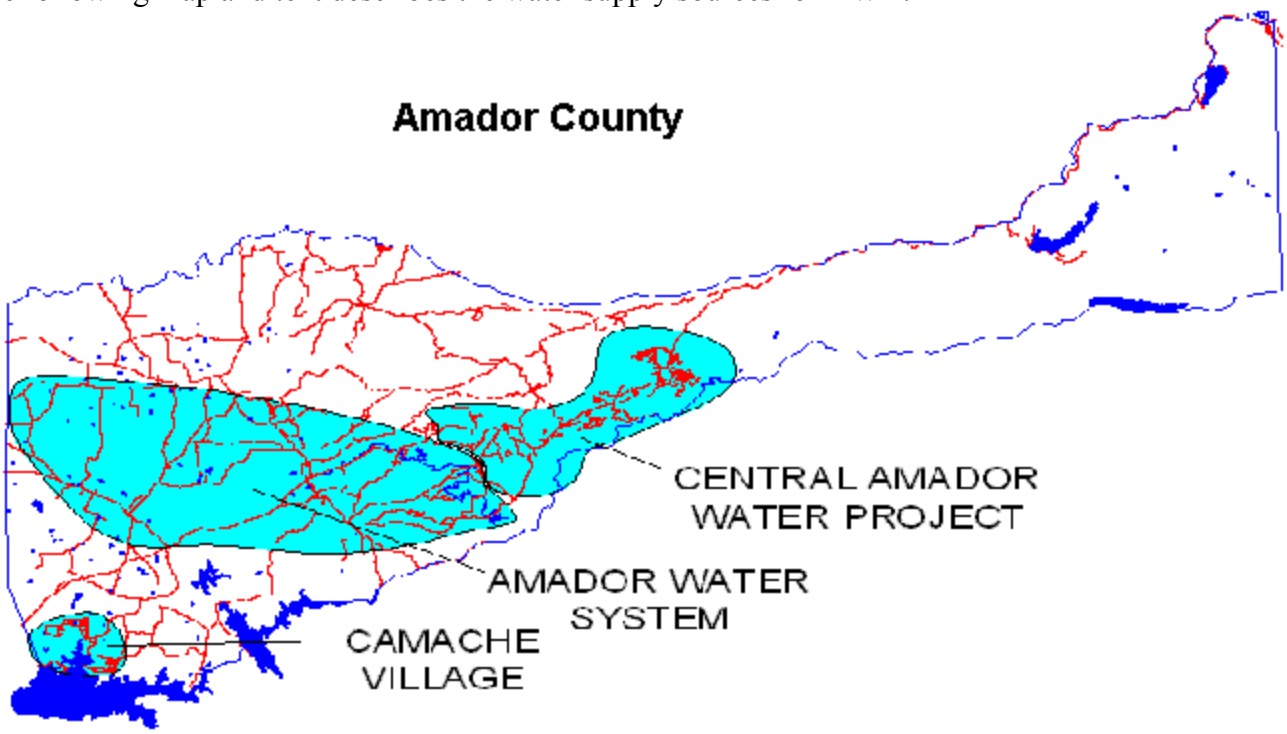
The two most significant hazards facing the AWA are wildfires and winter storms.

Vulnerability Assessment

The following sections show the total value of key AWA inventories at risk.

Water Supply

The following map and text describes the water supply sources for AWA.



Amador Water System (AWS). The Amador Water System consists of two main water treatment plants, approximately 100 miles of water main piping, and twenty three miles of conveyance canals. The service area covers over 450 square miles, and serves the communities of Amador City, Drytown, Ione, Jackson, Martell, Sutter Creek, Sutter Hill and their vicinities. In addition, the system also supplies raw water for agricultural, industrial, commercial and domestic irrigation needs to both public facilities and individual raw water customers.

Central Amador Water Project System (CAWP) The Central Amador Water Project System provides wholesale and treated water to the upcountry communities of Jackson Pines, Mace Meadows, Pine Acres, Pine Grove, Pioneer, Rabb Park, Ranch House Estates and vicinity, Silver Lake Pines/Sierra Highlands, and the Sunset Heights area. In addition to delivering wholesale water, the Agency also retails domestic water to five nearby areas.

Lake Camanche Village (LCV). The Agency also provides water service to the Lake Camanche area serving 450 homes and small commercial businesses. The domestic water supply for Lake Camanche Village is from groundwater.

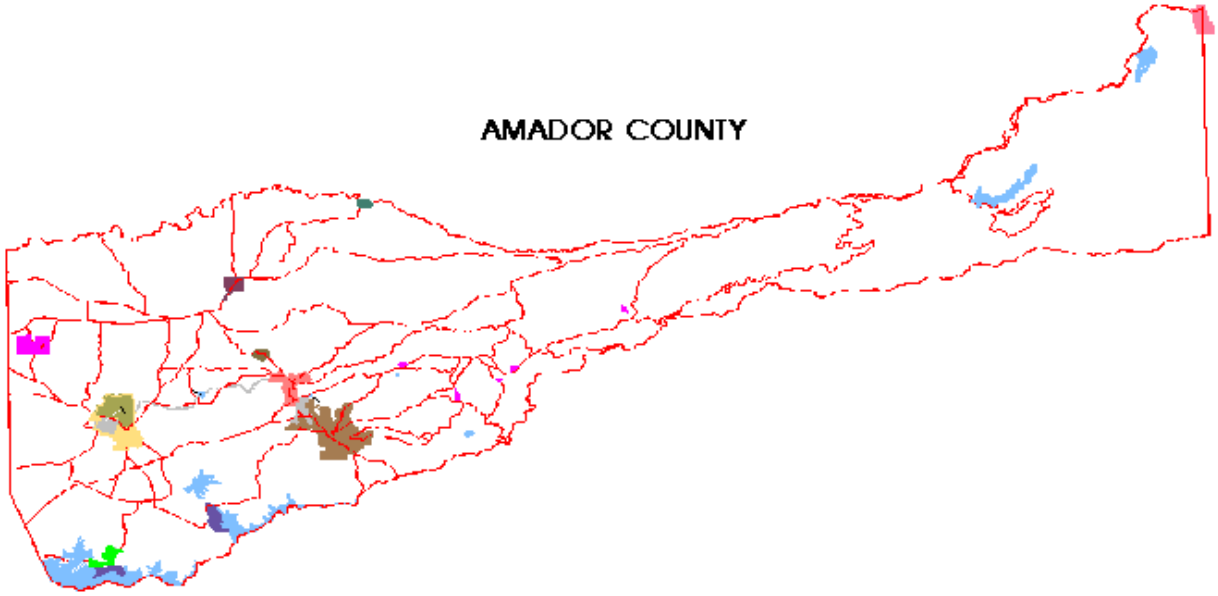
La Mel Heights. The Agency also provides water service to La Mel Heights, a 50-unit subdivision. The only water supply is groundwater.

The Amador Canal. The Amador Canal, maintained by the AWA as part of its water supply system, is a 23.2 mile canal located in the foothills of the Sierra Nevada, approximately two to six miles east and north of the City of Jackson. AWA is looking at replacing the open ditch canal system with a pipeline system. The new system is proposed to counter deficiencies associated with the open ditch system such as water quality, water loss, operation and maintenance costs, reliability, and conveyance of the water supply and water supply utilization.

Wastewater

The AWA owns and operates several different wastewater systems in various areas throughout Amador County. Currently the Agency serves the communities of Fairway Pines, Tiger Creek Estates, Gayla Manor, Wildwood Estates, Surrey Junction, Jackson Pines, Pine Grove, Martell, Viewpoint Estates, Eagles Nest, and Lake Camanche Village Unit 6. The wastewater generated in Martell is piped to the City of Sutter Creek for treatment. The remaining systems consist of subsurface leach fields and spray disposal fields. The following map illustrates these areas.

AWA
WASTEWATER SYSTEMS



Assets/Values at Risk

The wildfire and winter storm hazards are significant particularly in the CAWP area, which encompasses the communities of Buckhorn, Pioneer, Pine Grove and the major subdivision areas of Mace Meadow, Fairway Pines, Rabb Park, Ridgeway Pines, Silver Lake Pines, Sierra Highlands, Tiger Creek Estates, Pine Acres, Jackson Pines, the Toma Lane area and Sunset Heights.

First, CAWP receives its water supply from the Mokelumne River at Tiger Creek Afterbay. The water is pumped about 1,200 feet to the Buckhorn Water Treatment Plant. In heavy storms or wildfires, there is a medium probability that the power is interrupted to the pumping stations. Additionally, the pumping stations themselves are located in a steep canyon and could be damaged or destroyed in a wildfire. In the CAWP distribution system, the waterlines that were installed in the 1960s and 1970s are not sized to current fire flow standards.

Critical Facilities Inventory

Utilizing the definition of critical facilities previously set forth in this Plan, the critical facilities under the domain of the AWA are listed below.

- The CAWP pump stations and the Buckhorn Water Treatment Plant
- The AWS's Ione and Tanner Water Treatment Plants
- The AWS Canal System
- The LaMel Heights Well and Water Storage Tank

Cultural and Natural Resources at Risk

Cultural and natural resources in areas under ownership and control of AWA include those previously identified in the County inventory.

Vulnerability to Flood

AWA has no unique vulnerabilities to flood events.

Vulnerability to Wildfire

AWA vulnerabilities to wildfire include those described above.

Vulnerability to Other (Non-Mapped) Hazards: Avalanches, Agricultural Hazards, Dam Failure, Drought, Earthquakes, Landslides, Natural Health Hazards, Severe Weather, Volcanoes

Except for those mapped hazards, flood and wildfire, the risk assessment for this plan, as previously described, covers the entire geographical extent of the County-wide Planning Area. Thus, the risk assessment for the County also includes and directly corresponds to the unincorporated portions of the County and all incorporated jurisdictions, including the AWA.

Unique AWA vulnerabilities to these other hazards include those described above associated with winter storm events.

JACKSON VALLEY IRRIGATION DISTRICT

Population: 300+
Area: 12,800 Acres

Background

The Jackson Valley Irrigation District (JVID) was organized in 1956 and contains 12,800 acres lying along Jackson Creek in western Amador County. The District is owned by local ranchers and farmers and uses water generated from the Mokellumne River and Jackson Creek, stored in Lake Amador. When JVID is fully developed, it expects to irrigate about 6,000 acres a year and to require a net supply of about 18,000 acre-feet a year for that purpose.

Hazard Summary

Based on information provided by the District, a hazard summary for the JVID is provided below.

SUMMARY HAZARD ANALYSIS: JACKSON VALLEY IRRIGATION DISTRICT				
Hazard	**Frequency of Occurrence**	**Spatial Extent**	**Potential Magnitude**	**Significance**
Avalanches				
Dam Failure	Unlikely	Significant	Critical	High
Drought	Likely	Significant	Critical	High
Earthquakes				
Floods	Likely	Limited	Limited	Medium
Hail				
Heavy Rains/Lightning				
High Winds				
Landslides				
Natural Health Hazards				
Tornados				
Wildfires	Likely	Significant	Critical	Medium

SUMMARY HAZARD ANALYSIS: JACKSON VALLEY IRRIGATION DISTRICT				
Hazard	**Frequency of Occurrence**	**Spatial Extent**	**Potential Magnitude**	**Significance**
Winter Storms				

Guidelines:

Frequency of Occurrence
Highly Likely: Near 100% probability in next year.
Likely**:** Between 10 and 100% probability in next year, or at least one chance in ten years.
Occasional**:** Between 1 and 10% probability in next year, or at least one chance in next 100 years.
Unlikely**:** Less than 1% probability in next 100 years.

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

Potential Magnitude
Catastrophic**:** More than 50% of area affected
Critical**:** 25 to 50%
Limited: 10 to 25%
Negligible**:** Less than 10%

Significance (Your subjective opinion)—***Low***, ***Medium***, ***High***

In addition, the District provided historic incident information for the following types of events:

- Floods (1980, 1995, 1998)

Details are provided in Hazard-specific sections as appropriate.

Vulnerability Assessment

The following sections show the total value of key JVID inventories at risk.

Assets/Values at Risk

Based on inventories provided by JVID, the total value of identified assets at risk values for the JVID are detailed below:

VALUES OF IDENTIFIED ASSETS AT RISK	
Asset Type	**Net Value**
Jackson Creek Dam	$2,500,000
Sacrificial Road/Culverts	$100,000
Lake Amador Oxidation Ponds	$75,000
Lake Amador 100hp Pump Station	$25,000
Jackson Creek 15hp Pump Station/Dam	$25,000

VALUES OF IDENTIFIED ASSETS AT RISK	
Asset Type	**Net Value**
Jackson Creek Dam Outlet Works	$200,000
Pressure Pipe Distribution System (35mi – 36" to 6")	$3,500,000
Lake Amador Recreation Area	$1,725,000
Jackson Creek Hydro Plant	$700,000
JVID Office/Shop	$200,000
Total Value	**$9,050,000**

Cultural and Natural Resources at Risk

Cultural and natural resources in areas under ownership and control or in the area of JVID include those previously identified in the County inventory.

Vulnerability to Flood

Flooding is a significant hazard to JVID. The following information details past flood events impacting the District.

January 1980 – Lake Amador, located in the Jackson Valley Irrigation District (JVID), experienced a very large spill event, (i.e., 4-feet over spill). Damaged infrastructure included JVID Sacrificial road and structures. Total damages and disaster relief funding estimated at $15,286. There was additional Levee and Jackson Creek damage to private parties. Request letters are on file asking assistance. Most letters do not specify dollar amount of damage. One estimated repair at $75,000. Assistance to these private parties was denied.

January 1995 – Flooding occurred on JVID Jiminez property. Damages included eroded embankment/levee and damage to distribution pipeline. Total damages estimated at $1,999; relief funding estimated at $1,514.

February 1998 – Major flooding occurred below Dam on JVID property and on the JVID creek towards the western end of District. Damage to infrastructure included the following: Oxidation Basin Levee - $7,274; Lake Amador Sacrificial Road - $13,551; Jackson Creek Pumping Station Dam - $42,691; and Dry Creek repair - $13,156. Total damages and disaster relief funding estimated at $76,672.

All JVID assets listed above are vulnerable to flood events with the exception of the Lake Amador Recreation Area and the JVID Office/Shop.

Vulnerability to Wildfire

Wildfire is also a significant hazard to JVID. The Lake Amador Recreation Area is the most vulnerable JVID asset to a wildfire

Vulnerability to Other (Non-Mapped) Hazards: Avalanches, Agricultural Hazards, Dam Failure, Drought, Earthquakes, Landslides, Natural Health Hazards, Severe Weather, Volcanoes

Except for those mapped hazards, flood and wildfire, the risk assessment for this plan, as previously described, covers the entire geographical extent of the County-wide Planning Area. Thus, the risk assessment for the County also includes and directly corresponds to the unincorporated portions of the County and all incorporated jurisdictions, including those areas under the control of JVID.

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Multi-Hazard Mitigation Plan
4.3 Capability Assessment

Thus far, the planning process has identified the natural hazards posing a threat to Amador County and described and quantified the vulnerability of the County and communities to these risks. The next step, prior to forming Goals and Objectives for improving each jurisdiction's ability to reduce the impacts of these risks, is to assess what loss prevention mechanisms are already in place. Doing so provides the County's "net vulnerability" to natural disasters and more accurately focuses the goals, objectives and proposed actions of this plan. This part of the planning process is referred to as the "Capability Assessment."

The HMPC took two approaches in conducting this assessment. First, an inventory of existing policies, regulations and plans was made. These policy and planning documents were collected and reviewed to determine if they contributed to reducing hazard related losses, or if they inadvertently contributed to increasing such losses. Second, an inventory of other mitigation activities was made through the use of a matrix. The purpose for this effort was to identify activities and actions beyond policies, regulations and plans that were either in place, needed improvement, or could be undertaken, if deemed appropriate.

A summary of each of these elements is on the pages that follow.

General Plan, 1974

The General Plan is a document that guides the County's future development. It is a blueprint for land use in the County and provides long-term direction for the growth of Amador County. It is a 15 to 20 year plan for the unincorporated area of the County and expresses broad community values and goals, giving a picture of the desired character and quality of development in the County and policies which outline the steps to accomplish those goals. Although the Amador County General Plan Land Use Map was updated in the early 1990's, many of the policies have not been significantly revised or amended since the early 1970's. In February 2005 the Board of Supervisors gave staff direction to begin the preliminary research necessary to begin a comprehensive General Plan Update. According to the proposed schedule, the General Plan update is to be complete by Spring of 2009. Section 65302 of the California Government Code requires a General Plan to include seven mandatory elements—land use, circulation, housing, conservation, open space, noise, and safety.

As part of the comprehensive update, the County anticipates including policies to achieve the following goals:

- Include strategies and policies in the Land Use Element to conserve farmland and important resource lands and protect the viability of agriculture.
- Focus new development in areas that can best accommodate growth—ideally near existing towns or cities.
- Ensure that, as the County grows, it can continue to protect its water resources and water quality.
- Evaluate whether the General Plan should permit a significantly higher rate of growth and ultimate build out.
- Ensure that the backbone of the County's road network—state highways and major county roads—are sufficient to accommodate both the growing residents and visitor population.
- Protect the operations of the Amador County Airport-Westover Field, an important commercial and economic center for the County and its only general aviation airport.
- Integrate water and other resource plans and policies within the General Plan to ensure that an adequate supply and quality of water is available to meet future demands.
- Identify future areas for employment growth and target key industries that the County could most likely attract.

- Identify potential environmental impacts as early in the process as possible, so these impacts can be addressed through General Plan policies and implementation measures.

Updates to the Housing Element were finalized in May of 2005. The Housing Element defines the housing needs of the unincorporated Amador County population.

Land Use Element includes policies to address flood issues. Specifically, the element requires the identification of flood hazard areas and the adoption and implementation of Floodplain Management Regulations.

The 1974 Safety Element objective is to add safety considerations to the active planning processes in order to reduce loss of life, injuries, damage to property, economic loss, and social disruption resulting from fire, seismic activity and other possible disasters. Hazards given consideration in the plan include: Seismic; Unstable slopes and soils, mudslides, landslides, subsidence; wildfires and other types of fires; floods and overflow inundation; and indirect hazards or losses resulting from erosion, failure to protect economic minerals, etc.

Codes and Ordinances

County Code, August 30, 2005

Title 2
ANMINISTRATION

Chapter 2.64
Chapter 2.64 of the Amador County Code provides for the preparation and execution of plans for the protection of persons and property within Amador County in the event of an emergency; to ensure the continuity of local government; to guarantee the direction of the emergency management organization; and to coordinate the emergency functions of this county with all other public agencies, corporations and affected private persons. The Sheriff is designated as the Director of Emergency Services.

Chapter 2.64 further creates the Disaster Council consisting of the following: The Sheriff/Director of Emergency Services or their designee who shall be Chairman; the Chairman of the Board of Supervisors or their designee who shall be Vice-Chairman; one representative from each city appointed by City Councils; one Fire representative appointed by the Fire Chief's Association; one Law representative appointed by the Chief's of Police; one representative from the School District; one representative of each of the Special Districts/Tribes; Director/Agency heads of county departments having disaster responsibility or their designee; such representative of other organizations, either civic, business, labor, veterans, professional or other organizations having an official organization having disaster responsibility; and, the Emergency Services Coordinator. The Disaster Council is empowered to develop and recommend for adoption by the Board of Supervisors emergency operations plans or practices and such policies, ordinances or resolutions necessary to implement such plans and practices. The Disaster Council meets on a quarterly basis.

Title 7
HEALTH & SAFETY

Chapter 7.88
MITIGATIONS FOR NEW DEVELOPMENT PROJECTS IN THE ROCK CREEK DRAINAGE BASIN

7.88.030 Imposition of mitigation measures.
Whenever a development project within the Rock Creek drainage basin is approved by any agency, the public works agency shall impose on said development project mitigation measures sufficient to mitigate the development project's potential to flood Amador Plaza in the event of a one hundred-year flood event. (Ord. 1567(part), 2003).

Chapter 7.32
BURNING PERMIT AND REGULATIONS

7.32.010 Burning permit required—When.
It is unlawful for any person to set fire to or burn any brush, logs, stumps, fallen timber, fallows, slash or grass, brush, or forest covered land or any other inflammable material; and it is unlawful for any person to burn inflammable material in any incinerator, barbeque pit or outdoor cooking stove or other such device within any portion of the unincorporated area of the county between May 1st and the date the director of the department of forestry declares, by proclamation, that the hazardous fire conditions have abated for that year, or at any other time during any year when the director of the department of forestry has declared, by proclamation, that unusual fire hazard conditions exist in the area, unless such person first obtains a written permit to do so from the constituted fire control authority within the area wherein the fire is to be set, which permit shall be issued in writing and shall state the times at which and the terms and conditions subject to which said fire shall be permitted or said burning shall be done. (Ord. 1049 §2, 1985).

7.32.040 Fire protection or fire break required.
Every person owning, leasing, controlling or operating any cabin, house, hotel, apiary, or other building or structure in the county, and every person leasing or controlling any such land shall at all times do all the following: maintain upon said land, around or adjacent to said cabin, house, hotel, apiary or other building or structure for a distance of not less than fifteen feet from the exterior walls or surfaces thereof; or to his or its property line, whichever is the lesser distance; provided, however, that this section shall not apply to trees, except where dead, or where the foliage of said trees shall be within ten feet of a chimney, nor shall it apply to evergreen vegetation where growing and preserved for decorative effect. (Ord. 1049 §5, 1984).

Title 15
BUILDINGS AND CONSTRUCTION

15.04 Adoption of Uniform Building and Related Codes.
The following building codes are adopted and enforced by Amador County:

1. Chapters 2 through 35 of the California Building Code, 2001 Edition (referenced to the 1997 Uniform Building Code of the International Conference of Building Officials), as published by the California Building Standards Commission and as amended by the State Department of Housing and Community Development, the Division of the State Architect/Access and Compliance, and the Office of Statewide Health Planning and Development, together with the following Appendices: Appendix Chapter 3 Division II (Agricultural Buildings), Appendix Chapter 4 Division I (Barriers for Swimming Pools, Spas and Hot Tubs), Appendix Chapter 15 (Reroofing), Appendix Chapter 16 Division I (Snow Load Design), Appendix Chapter 18 (Waterproofing and Damp proofing Foundations), Appendix Chapter 31 Division I (FloodResistant Construction) and Appendix Chapter 33 (Excavation and grading);
2. The 2001 Edition of the following codes, each as published by the California Building Standards Commission and as amended by the State Department of Housing and Community Development, the Division of the State Architect/Access and Compliance, and the Office of Statewide Health Planning and Development:
a. California Electrical Code (referenced to the 1999 National Electrical Code of the National Fire Protection Association);
b. California Mechanical Code (referenced to the 2000 Uniform Mechanical Code of the International conference of Building Officials);
c. California Plumbing Code (referenced to the 2000 Uniform Plumbing Code of the International Association of Plumbing and Mechanical Officials);
d. California Energy Code;
e. California Elevator Safety Construction Code;

Chapter 15.16
FLOODPLAIN MANAGEMENT REGULATIONS

15.16.030 Statement of purpose.
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:
A. Protect human life and health;
B. Minimize expenditure of public money for costly flood-control projects;
C. Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
D. Minimize prolonged business interruptions;
E. 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;
F. 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;
G. Insure that potential buyers are notified that property is in an area of special flood hazard; and
H. Insure that those who occupy the areas of special flood hazard assume responsibility for their actions. (Ord. 1503(part), 2000).

15.16.040 Methods of reducing flood losses.
In order to accomplish its purposes, this chapter includes methods and provisions for:

A. 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;
B. Requiring that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;
C. Controlling the alteration of natural floodplains, stream channels, and natural protective barriers, which help accommodate or channel floodwaters;
D. Controlling filling, grading, dredging and other development which may increase flood damage; and
E. Preventing or regulating the construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards in other areas. (Ord. 1503(part), 2000).

"Base flood" means the flood having a one percent chance of being equaled or exceeded in any given year (also called the "100-year flood"). Base flood is the term used throughout this chapter.

"Floodway" means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one foot. Also referred to as "regulatory floodway."

"Historic structure" means any structure that is:
1. Listed individually in the National Register of Historic Places (a listing maintained by the Department of Interior) or preliminarily determined by the Secretary of the Interior as meeting the requirements for individual listing on the National Register;
2. Certified or preliminarily determined by the Secretary of the Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined by the Secretary to qualify as a registered historic district;
3. Individually listed on a state inventory of historic places in states with historic preservation programs which have been approved by the Secretary of Interior; or
4. Individually listed on a local inventory of historic places in communities with historic preservation programs that have been certified either by an approved state program as determined by the Secretary of the Interior or directly by the Secretary of the Interior in states without approved programs.

"Lowest floor" means the lowest floor of the lowest enclosed area, including basement (see "Basement" definition).

1. An unfinished or flood-resistant enclosure below the lowest floor that is usable solely for parking of vehicles, building access or storage in an area other than a basement area, is not considered a building's lowest floor provided it conforms to applicable nonelevation design requirements, including but not limited to:
a. The wet floodproofing standard in Section 15.16.160 (C)(3);
b. The anchoring standards in Section 15.16.160 A;
c. The construction materials and methods standards in Section 15.16.160 B.
d. The standards for utilities in Section 15.16.170.

2. For residential structures, all subgrade enclosed areas are prohibited as they are considered to be basements (see "Basement" definition). This prohibition includes below-grade garages and storage areas.

"New construction" means, for floodplain management purposes, structures for which the "start of construction" commenced on or after the effective date of floodplain management regulations adopted by this community and includes any subsequent improvements to such structures.

"Special flood hazard area (SFHA)" means an area in the floodplain subject to a one percent or greater chance of flooding in any given year. It is shown on an FHBM or FIRM as zone A, AO, A1-30, AE, A99, or AH.

"Substantial improvement" means any repair, reconstruction or improvement of a structure, the cost of which equals or exceeds fifty percent of the market value of the structure before the "start of construction" of the improvement. This term includes structures which have incurred "substantial damage," regardless of the actual repair work performed. This term does not, however, include either:
1. Any project for improvement of a structure to comply with existing state or local health, sanitary or safety code specifications which are solely necessary to assure safe living conditions; or
2. Any alteration of a structure listed on the National Register of Historic Places or a State Inventory of Historic Places.

15.16.130 Establishment of development permit.
A development permit shall be obtained before construction or development begins within any area of special flood hazards established in Section 15.16.070.

15.16.160 Standards of construction.
In all areas of special flood hazards the following standards are required:
A. Anchoring.
1. All new construction and substantial improvements 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 15.16.190
B. Construction Materials and Methods. All new construction and substantial improvements shall be constructed:
1. With flood resistant materials as specified in FEMA Technical Bulletin TB 2-93, and utility equipment resistant to flood damage;
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 if
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 15.16.050 definitions for "Basement," "Lowest floor," "New construction," "Substantial damage" and "Substantial improvement".)
1. Residential construction, new or substantial improvement of any structure shall have the lowest floor including basement:
a. In an AO zone, elevated above the highest adjacent grade to a height equal to or exceeding the depth number specified in feet on the FIRM, or elevated at least two feet above the highest adjacent grade if no depth number is specified;
b. In an A zone, elevated to or above the base flood elevation; said base flood elevation shall be determined by one of the methods in Section 15.16.150 B of this chapter;
c. In all other zones, elevated to or above the base flood elevation. Nonresidential structures may meet the standards in subsection (C)(2) of this section. Upon the completion of the structure the elevation of the lowest floor including basement shall be certified by a registered professional engineer or surveyor, and verified by the community building inspector to be properly elevated. Such certification and verification shall be provided to the floodplain administrator.
2. Nonresidential construction, new construction and substantial improvement of any structure shall either be elevated in conformance with subsection (C)(1) of this section, or together with attendant utility and sanitary facilities:
a. Be floodproofed below the elevation recommended under Section 15.16.160(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 professional engineer or architect that the standards of this subsection are satisfied. Such certifications shall be provided to the floodplain administrator.

15.16.210 Mudslide (i.e., mudflow) prone areas.
A. The floodplain administrator shall review permits for proposed construction or other development to determine if it is proposed within a mudslide area.
B. Permits shall be reviewed to determine that the proposed site and improvement is reasonably safe from mudslide hazards. Factors to be considered in making this determination include but are not limited to the:
1. Type and quality of soils;
2. Evidence of groundwater or surface water problems;
3. Depth and quality of any fill;
4. Overall slope of the site; and
5. Weight that any proposed development will impose on the slope.
C. Within areas which have mudslide hazards, the floodplain administrator shall require that:
1. A site investigation and further review shall be made by persons qualified in geology and soils engineering;
2. The proposed grading, excavation, new construction and substantial improvements shall be adequately designed and protected against mudslide damages;
3. The proposed grading, excavations, new construction and substantial improvements do not aggravate the existing hazard by creating either onsite or offsite disturbances; and
4. Drainage, planting, watering and maintenance shall not endanger slope stability. (Ord. 1503(part), 2000).

15.16.220 Flood-related erosion-prone areas.

A. The floodplain administrator shall require permits for proposed construction and other development within all flood-related erosion-prone areas as known to the community.

B. Such permits shall be reviewed to determine whether the proposed site alterations and improvements will be reasonably safe from flood-related erosion and will not cause flood-related erosion hazards or otherwise aggravate the existing hazard.

C. If a proposed improvement is found to be in the path of flood-related erosion or would increase the erosion hazard, such improvement shall be relocated or adequate protective measures shall be taken to avoid aggravating the existing erosion hazard.

D. Within zone E on the flood insurance rate map, a setback is required for all new development from the lake, bay, riverfront or other body of water to create a safety buffer consisting of a natural vegetative or contour strip. This buffer shall be designated according to the flood-related erosion hazard and erosion rate, in relation to the anticipated "useful life" of structures, and depending upon the geologic, hydrologic, topographic and climatic characteristics of the land. The buffer may be used for suitable open space purposes, such as for agricultural, forestry, outdoor recreation and wildlife habitat areas, and for other activities using temporary and portable structures only. (Ord. 1503(part), 2000).

15.16.240 Conditions for variances.

A. Generally, variances may be issued for new construction, substantial improvements, and other proposed new development to be erected on a lot of one-half acre or less in size contiguous to and surrounded by lots with existing structures constructed below the base flood level, providing subdivisions (B)(1) through (11) of Section 15.16.230 have been fully considered. As the lot size increases beyond one-half acre, the technical justification required for issuing the variance increases.

B. Variances may be issued for the repair, or rehabilitation of "historic structures" as defined in Section 15.16.050 of this chapter upon a determination that the proposed repair or rehabilitation will not preclude the structure's continued designation as an historic structure and the variance is the minimum necessary to preserve the historic character and design of the structure.

C. Variances shall not be issued within any mapped regulatory floodway if any increase in flood levels during the base flood discharge would result.

D. Variances shall only be issued upon a determination that the variance is the minimum necessary, considering the flood hazard, to afford relief. "Minimum necessary" means to afford relief with a minimum of deviation from the requirements of this chapter. For example, in the case of variances to an elevation requirement, this means the board of supervisors need not grant permission for the applicant to build at grade, or even to whatever elevation the applicant proposed, but only to that elevation which the board of supervisors believes will both provide relief and preserve the integrity of the local ordinance.

E. Variances shall only be issued upon a:

1. Showing of good and sufficient cause;

2. Determination that failure to grant the variance would result in exceptional hardship to the applicant; and

3. Determination that the granting of a variance will not result in increased flood heights, additional threats to public safety, extraordinary public expense, create nuisances (as defined in Section 15.16.050 see "Public safety or nuisance"), cause fraud on or victimization of the public (as defined in Section 15.16.050), or conflict with existing local laws or ordinances.

F. Variances may be issued for new construction, substantial improvements, and other proposed new development necessary for the conduct of a functionally dependent use provided that the provisions of subsections B through E of this section are satisfied and that the structure or other development is protected by methods that minimize flood damages during the base flood and does not result in additional threats to public safety and does not create a public nuisance. (Ord. 1503(part), 2000).

Chapter 15.30
FIRE AND LIFE SAFETY REGULATIONS

15.30.080 Fire management plans.
A. A fire management plan may be required for any project if the project will have a significant effect on the provision of fire protection services or when such a plan is necessary to achieve the same practical effect as the requirements of this chapter.
B. A fire management plan shall address the following:
1. Impact on the pertinent fire protection agency's ability to provide service;
2. Availability of fire protection water to the site;
3. Ingress/egress and circulation;
4. Fire hazards existing within the project;
5. Requirements of this chapter which cannot be met due to project design or other constraints;
6. Fire protection measures which are consistent with the provisions of this chapter or other recognized fire protection standards;
7. Fuel modification plan will be required on specific projects, must be completed by a registered professional forester. (Ord. 1437 §1(part), 1997: Ord. 1385 §1(part), 1995).

15.30.090 Setback of structures for defensible space.
A. All buildings on parcels one acre and larger shall have a minimum thirty-foot setback from all property lines and/or the center of a roadway whichever is farther, unless a deviation is granted pursuant to Section 15.30.170 of this chapter that has the same practical effect.
B. Multi-parcel projects containing primarily parcels of less than one acre shall have a thirty-foot setback from the exterior boundaries of the project if the project ad joins land zoned A or AG. (Ord. 1437 §1(part), 1997: Ord. 1385 §1(part), 1995).

15.30.100 Maintenance of defensible space.
A. To ensure continued maintenance of properties in conformance with Section 15.30.080 of this chapter and to assure continued availability, access, and utilization of defensible space during a wildfire, provisions for annual maintenance shall be included in fire management plans.
B. Fuel modification may be required to a width of ten feet on each side of driveways by reducing ground fuels to less than eighteen inches in height and by maintaining tree and shrub separations necessary to reduce fuel loading. (Ord. 1437 §1(part), 1997: Ord. 1385 §1(part), 1995).

15.30.150 Fire protection standards.
For the purpose of interpretation and enforcement of this chapter, the board may be guided by the most recent editions of the following publications:

A. Fire Safe Guidelines for Residential Development in California California Dept. Forestry and Fire Protection 1416 9th Street Sacramento, California
B. Insurance Service Office ISO Grading Schedules ISO Guide for Determining Fire Flow 160 Water Street New York, New York
C. National Fire Protection Association NFPA National Fire codes NFPA Life Safety Codes 470 Atlantic Avenue Boston, Massachusetts
D. Public Resources Code Section 4290 Public Resources Code Section 4291
E. Title 14 California Code of Regulations
F. Uniform Fire Code International Conference of Building Officials and Western Fire Chief Association 5360 South Workman Mill Road Whittier, California 90601 (Ord. 1437 §1(part), 1997: Ord. 1385 §1(part), 1995).

Chapter 15.40
EROSION CONTROL ORDINANCE

15.40.020 Scope.
This chapter sets forth rules and regulations by which excavation, grading, and earthwork construction, including fills and cuts, embankments and impoundment structures (collectively "excavation") are to be reviewed and permitted by the county. It establishes an administrative procedure for the issuance of required permits involving excavation, the approval of plans and inspection of all permitted excavation, and the establishment of measures to control erosion and other adverse impacts of excavation ("erosion control measures"). (Ord. 1619 §2(part), 2005).

15.40.030 Erosion control measures to be included in county permits.
All permits issued by the county causing land disturbance shall include erosion control measures except for permits and reclamation plans which are separately reviewed and permitted. Those permits covered by this chapter include but are not limited to conditional use permits, on-site septic system permits, county road encroachment permits, well permits and grading permits. All building permits shall include erosion control measures as part of the building permit. (Ord. 1619 §2(part), 2005).

Fire Prevention Regulations and Enforcement

The laws and regulations concerning fire prevention on private land in Amador County are enforced primarily by CDF and the County. The following list contained within the Amador County Fire Hazard Plan provides a summary of the major laws and regulations currently in force in Amador County that pertain to fire prevention.

Public Resource Code (PRC 4291)

A person must maintain a minimum of a 100-foot-wide fuelbreak around all buildings and structures unless the CDF determines that 100 feet is needed for protection. PRC 4291 does not require the removal of individual trees, ornamental shrubbery or similar plants which are used as ground cover if they do not form a means of rapidly transmitting fire from the native growth to a building or structure. Other portions of this regulation address the requirement for 10 feet or more of space between trees branches and chimneys or stovepipes, the need to keep needles and

leaves off of the roof, and the requirement to keep a screen over the outlet to a chimney or stovepipe.

PRC 4421

A person shall not set a fire which is on any land that is not his own without the permission of the owner.

PRC 4422

A person shall not allow a fire to burn uncontrolled on land he owns or escape to someone else's property.

PRC 4423

A person must have a permit to burn vegetative material during the fire season. The permits are obtained from the CDF. Open burning during any time of the year can only be done on "permissive burn days" as regulated by the Amador Air District. Burning on non-residential property may also require a permit from the Air District any time of the year and you should call them for guidance.

Amador County Board of Supervisors Resolution No. 99-273

This resolution adopts the policy pursuant to Division 12, Part 5 of the California Health and Safety Code that vacant parcels in subdivisions, that are ten acres or smaller, will be declared a public nuisance and owner will be noticed to destroy weeds if the CDF or other authorized fire official verifies that the weeds constitute a fire hazard.

Community Plans

Amador County Emergency Operations Plan (August 1999)

The Emergency Operations Plan includes information on hazards facing the county and associated response and recovery information, with a focus on large-scale emergencies requiring coordinated responses by multiple agencies and jurisdictions.

Community Wildfire Protection Plans

National, state, and local policies have focused efforts on reducing the threat of wildfire, particularly in the wildland urban interface. Community wildfire protection plans assist communities in defining priorities for the protection of assets in the wildland urban interface areas. To date, the Volcano community is the only community to have developed a community wildfire protection plan.

Amador County Fire Hazard Reduction Plan

The objective of the Amador County Fire Hazard Reduction Plan is to provide the Amador Fire Safe Council a foundation to identify, prioritize, and link fuel modification treatment areas in order to create a Fire Safe community

Other Services/Groups

Amador County Sheriff's Office of Emergency Services (OES)

The Amador County Sheriff's Office of Emergency Services (OES) is responsible for the administration of the county emergency management program on a day to day basis and during disasters. The office is charged with providing the necessary planning, coordination, response support and communications with all agencies affected by large scale emergencies or disasters. The Emergency Services Coordinator also manages the County Emergency Operations Center (EOC) which is located in the Sheriff's Office. In any disaster the EOC becomes the single focal point for centralized management and coordination of emergency response and recovery operations during a disaster or emergency affecting the Amador Operational Area.

The mission of the County OES is to develop and maintain the capability to prepare for, mitigate, respond to and recover from emergencies and disasters. It is also their goal to strengthen and perpetuate a comprehensive emergency management program for the County of Amador on behalf of the citizens of the County.

Amador County Resource Conservation District (RCD)

The Amador County Resource Conservation District is committed to:

- generating wise use of basic resources in areas such as forest health, water quality, changing land use and air quality;
- identifying and supporting innovative approaches to improving the regions resource based economy in areas such as forestry, agriculture, tourism and energy production; and
- preserving the regional quality of life and foothill culture.

The District has expanded the scope of conservation leadership in the communities by selecting do-able projects and partnerships with California Department of Forestry and Fire Protection, Amador Water Agency and Foothill Conservancy. Through their Long Range Plan, the District proposes to:

- inventory all significant resources in the county;
- project the use, degradation or limits of these resources through the year 2020;
- consider the health of the resource;
- identify those that could significantly change, effecting ecosystem balance and quality of life; and

the RCD plans to accomplish community projects through coop-efforts to display resource conservation principals and solutions.

Amador County Agriculture Department

The Amador County Agricultural Commissioner provides for the local administration of statewide agricultural enforcement programs that protect the agricultural industry and environment of Amador County and protects the public health, safety, and welfare of its citizens. The Agriculture Department serves as the enforcement agency for the California Department of Food and Agriculture, the Department of Pesticide Regulation, and the Structural Pest Control Board.

Amador County Building Department

The Amador County Building Department maintains and protects public health, safety and welfare, and the quality of life for County residents by maintaining a comprehensive plan as required by statute and administration and enforcement of codes and ordinances.

The Building Department processes and issues building and grading permits, reviews and checks plans for all construction in the unincorporated area of the Amador County. This department provides field inspection of projects requiring construction or grading approval and enforces County and State building codes. The department responds to a variety of general inquiries about land use regulations and provides permit and ordinance interpretation.

Amador County Public Health

The Amador County Public Health Department is committed to community health by promoting individual health, preventing disease and disability, and protecting against environmental risk, through education and intervention.

Amador County Public Works

The Agency has responsibility for the management of special road maintenance districts; the review of property development projects; divisions of property; modification or establishment of property lines; the acquisition and deposition of real property related to County public improvements; and the permitting for encroachments or other proposed construction in the road right-of-way on County-maintained roads.

The Agency is administered by the Director of Public Works and a mid-management staff. They are responsible for developing or managing the preparation of various master plans for future construction of County roads, drainage, and other transportation improvements.

The Agency is responsible for issuing all grading and erosion control permits; transportation and encroachment permits; and inspections of all residential or commercial subdivision improvements.

Central Sierra Resource Conservation and Development (CCSRC&D)

The CCSRC&D is a member of California's Association of Resource Conservation and Development Councils CARC&DC. The mission of the CARC&DC is to promote, correlate, and coordinate the efforts of all Resource Conservation & Development (RC&D) Areas in California. The Association provides a position of effective leadership among the many trade associations, citizens groups, and government entities who share an interest in the proper development and use of the finite and regenerative resources within the RC&Ds of this Association.

Cosumnes River Task Force

The Cosumnes River Task Force was formed in 1998. Their mission is to develop a long term strategy that will encourage restoration of watershed health and improve flood management.

Rabies Task Force

Amador County Rabies Task Force first convened in October 1999 as the result of numerous rabies situations that had arisen over the previous months, several confirmed cases of rabid animals in Amador County and many human exposures or potential exposures. Rabies Task Force Ongoing Goals include:

- Continued public education regarding bats, rabies, mandatory vaccination of dogs and cats, animal bites, etc
- Continued healthcare provider education
- Support Rabies Control Program, including rabies vaccination clinics
- Educate livestock owners of the need for vaccination of their animals
- Continue to identify problems in reporting/treatment through discussion of rabies situations

Amador Fire Safe Council

The Amador County Fire Safe Council is a non-profit organization that partners local businesses, community organizations, and property owners of Amador County. Advisors to the council include the USFS, CDF, BLM, Amador Resource Conservation District, the Amador County Board of Supervisors and Central Sierra RC&D. The Amador Fire Safe Council is chartered to educate and assist Amador County residents in keeping their properties and Amador County a Fire Safe Community.

Amador Fire Protection District

The Amador Fire Protection District (AFPD) was organized in 1990 by approval of the voters and resolution of the Amador County Board of Supervisors. The District is responsible for emergency fire, rescue, and medical aid service in approximately 85% of the unincorporated area of Amador County. This is accomplished by the many volunteer firefighters that are members of the AFPD, and the response of other firefighters in surrounding fire departments/districts. In

addition, AFPD contracts with CDF for fire protection services. The AFPD maintains automatic aid and mutual aid agreements with these departments.

The District operates seven fire stations. The District provides emergency fire, rescue, and medical aid service to the communities and surrounding areas of Amador Pines, Pioneer, Pine Grove, Pine Acres, Volcano, Martell, Drytown, Willow Springs, Fiddletown, River Pines, and the City of Plymouth.

Ione City Fire Department
Primary responsibility is for the Ione City area. The Department operates one fire station.

Jackson City Fire Department
Primary responsibility is for the Jackson City area. The Department operates two fire stations.

Jackson Valley Fire Protection District
Primary responsibility includes a large area in the southwest corner of Amador County lying north of Lake Comanche and northwest of Pardee Reservoir. The District operates two fire stations.

Lockwood Fire Protection District
Primary responsibility is an area along Shake Ridge Road, in north central Amador County, extending from Quartz Mountain Road to the CDF Fire Station at Dew Drop. The District operates two fire stations.

Plymouth Fire Protection District
This District is operated under contract with the Amador Fire Protection District. The District includes one fire station but it is leased for $1.00 to AFPD under a contract that provides service to the District.

Sutter Creek Fire Protection District
Primary responsibility includes the city of Sutter Creek and Amador City. The District operates three fire stations.

Kirkwood Meadows Fire Department
Primary responsibility is for the Kirkwood Resort area at the eastern end of the County. The Department operates one fire station.

Fire Stations in Amador County
Taken from the Amador County Hazardous Fuels Reduction Plan, the following table identifies the locations and resources of Fire Stations in Amador County

TABLE 7

FIRE STATIONS IN AMADOR COUNTY

Manning	Department Name	Station #	Address	City	Comments
Volunteer	Amador Fire Protection District	Station 111	26517 Meadow Drive	Pioneer	Type 3 Engine/1500 gal Water Tender
Volunteer	Amador Fire Protection District	Station 112	23770 Van de Hei Ranch Rd.	Pioneer	Type 2 Engine (750 gal) & 3500 gal Water Tender
Volunteer	Amador Fire Protection District	Station 114	19840 Highway 88	Pine Grove	Type 2 Engine (800 gal) & Type 3 Engine/1500 gal Water Tender
Volunteer	Amador Fire Protection District	Station 115	18655 Ridge Road	Pine Grove	Type 2 Engine (500 gal)
Volunteer	Amador Fire Protection District	Station 121	16850 Demartini Road	Plymouth	Type 2 Engine (750 gal), Type 4 Engine & Type 1 Water Tender (3500 gal)
Volunteer	Amador Fire Protection District	Station 122	18534 Sherwood Street	Plymouth	Type 2 Engine (800 gal), Type 3 Engine & Telesquirt/50 ft.
Volunteer	Amador Fire Protection District	Station 123	14410 Jibboom Street	Fiddletown	Type 2 Engine (500 gal), Type 3 Engine & Type 1 Water Tender (3500 gal)
Full Time	Ca. Dept. of Forestry (CDF)	Dew Drop-St. 10	29300 Dew Drop Bypass	Pioneer	
Part Time	Ca. Dept. of Forestry (CDF)	Mt. Zion-St. 80	19597 Highway 88	Pine Grove	
Full Time	Ca. Dept. of Forestry (CDF)	Pine Lodge-St. 30	15035 Shenandoah Road	River Pines	
Full Time	Ca. Dept. of Forestry (CDF)	Sutter Hill-St. 60	11660 Highway 49	Sutter Creek	
Volunteer	Ione Fire Department	Station 161	22 Jackson Street	Ione	Type 1 Engine, 2 x Type 2 Engines, Type 3 Engine/Water Tender (1200 gal) & Telesquirt
Volunteer	Jackson Fire Department	Station 131	Main Street & Highway 49	Jackson	Type 2 Engine (500 gal) & Type 3 Engine (500 gal)
Volunteer	Jackson Fire Department	Station 132	10600 Argonaut Lane	Jackson	Type 1 Engine (500 gal), Type 2 Engine (500 gal) & Telesquirt/75 ft.
Volunteer	Jackson Valley FPD	Station 171	2480 Quiver Drive	Ione	2 x Type 2 Engines & Type 1 Water Tender (2200 gal)
Volunteer	Jackson Valley FPD	Station 172	5700 Buena Vista Road	Ione	Type 2 Engine
Volunteer	Kirkwood Fire Department	Kirkwood Meadow	Kirkwood Meadows	Kirkwood	
Volunteer	Lockwood FPD.	Station 151	23141 Shake Ridge Road	Volcano	2 x Type 2 Engines & Type 1 Water Tender (3500 gal)
Volunteer	Lockwood FPD.	Station 152	Hale Rd & Shake Ridge Rd.	Volcano	
Full Time	Mule Ck. State Prison FD	n/a	4001 Highway 104	Ione	
Volunteer	Sutter Creek FPD	Station 141	350 Hanford Street	Sutter Creek	3 x Type 1 Engines & Type 1 Water Tender (3000 gal)
Volunteer	Sutter Creek FPD	Station 142	Highway 49 & Church Street	Sutter Creek	Type 2 Engine
Volunteer	Sutter Creek FPD	Station 143	10791 Water Street	Amador City	Type 3 Engine
Full Time	US Forest Service	Amador Ranger Sta.	26820 Silver Drive	Pioneer	

Fire Lookouts
Fire lookouts play a crucial role in preventing small fires from becoming large catastrophic wildfires through early detection, both within and outside of the county. In 2003, five lookouts were operational during the fire season that monitored fire conditions in and around Amador County: They are described in the following table.

TABLE 8

LOOKOUTS

Lookout Name	Managing Agency	Location
Blue Mountain	USFS (CDF & private Prior to 2003)	Calaveras County
Mt. Zion	CDF	Amador County
Leek Springs	USFS	El Dorado County
Bald Mt.	USFS	El Dorado County
Big Hill	USFS	El Dorado County

During FY2003/2004, funding was cut for the Lookout Towers due to the states ongoing budget crisis. Currently, the CDF Mt. Zion Lookout Tower is funded through community donations.

County Projects

The County also has many planned and ongoing projects focused on minimizing future losses associated with identified hazards. Many of these projects are sponsored and implemented by one or more County departments and/or other state and local agencies and organizations. Examples of projects include the following:

Fire Mitigation Projects

Current Amador Fire Safe Council projects include:

- **Fuel Hazard Reduction Projects**
    - Pioneer/Volcano
    - Pine Grove/ Volcano
    - Volcano USFS Planning Grant
    - Pine Acres BLM Grant
- **Amador County Fire Hazard Reduction Plan**
- **Evacuation Manual** - Our Evacuation Manual was prepared by the AFSC to assist in educating and preparing Amador residents for any emergency that may arise
- **Senior Assistance Program** – The Amador Fire Safe Council will provide defensible space clean-up for Amador County residents who are over 65 years of age, financially

unable to hire a contractor, concerned about wild fire and meet the USDA Rural Development Departments low income definition. This program is currently not funded.

- **Chipper Program** – Provides chipping of hazardous vegetation for structural clearing and for roadside and driveway clearing. This program is currently not funded.
- **Model Home Project** – This program is a Senior Assistance Project. It is intended to aid seniors in making their property fire safe by demonstrating fuels reduction and defensible space for properties.

Recently Completed and Ongoing Fire Hazard Reduction Projects
The following table provides information on the recently completed and ongoing fuel reduction projects in the Amador County.

TABLE 9

RECENTLY COMPLETED AND ON-GOING FIRE HAZARD REDUCTION PROJECTS

Project Name	Type	Manager	Administrative Unit	Status
Amador Watershed Improvement Project I	SFB, RSC, Ed	Amador Resource Conservation District	Pioneer/Volcano	Completed 2003
Pine Acres Fire Safe Plan	SFB, RSC, Ed	CDF	Pine Grove	Plan Completed 2003 – Work in Progress
Sierra Pacific Industries (SPI) Cooperative Fuelbreak Program	SFB	SPI and USFS	Upcountry	On-going
CDF Vegetation Management Program	SFB, RSC, Ed, Rx	CDF	County-wide	On-going
Pioneer Trail Shaded Fuelbreak	SFB, RSC	Amador Resource Conservation District	Pioneer/Volcano	Completed 2000
Sutter Highlands Fire Safe Plan	SFB, RSC, FPZ, Rx, Ed	CDF	Pine Grove	Completed 2000
Rams Horn/ Shake Ridge Fuel Modification Project	SFB, RSC, Ed	Amador Fire Safe Council	Pioneer/Volcano	In Progress
Pacific Gas and Electric Powerline Right-of-Way	Fuel treatment	PG&E	Sutter/Amador, Pine Grove, Pioneer/Volcano, Upcountry	On-going

Notes:
SFB – Shaded Fuelbreak
RSC – Roadside Clearing
Ed – Education
Rx -- Prescribed Burning
FPZ – Area Fire Protection Zones

Other

- The County, including its various jurisdictions and special districts conduct a variety of hazard preparedness and response training and drill sessions. The training and drill sessions are focused on familiarizing the trainees with established department procedures and equipment to improve overall hazard preparedness and response throughout the County. Also included is evacuation planning for the County.

LOCAL GOVERNMENT CAPABILITY MATRIX

In addition to the assessment of community policies, regulations and plans, the HMPC also created a matrix as a way of taking inventory of additional mitigation capabilities in each community. The intent of this effort was to see if there were any similarities or gaps in community programs and tools that might indicate where some improvements could be made. The matrix and the key to the matrix labels are located on the following pages.

	AMADOR COUNTY	AMADOR CITY	IONE	JACKSON	PLYMOUTH	SUTTER CREEK
Comp Plan/General Plan	Yes	Yes	Yes	Yes	Yes	
Land Use Plan	Yes	Yes	No	Yes	No	
Subdivision Ord	Yes	Yes	Yes	Yes	Yes	
Zoning Ordinance	Yes	Yes	Yes	Yes	Yes	
NFIP/FPM Ordinance	Yes	No	Yes	Yes	Yes	
- Map Date	Yes			Jul-97		
- Substantial Damage language?	Yes	No	No	Yes	No	
- Certified Floodplain Manager?	Yes	No	Yes	Yes	Yes	
- # of Floodprone Buildings?	2,059	15	567	548	61	209
- # of NFIP policies	136	0	50	41	1	16
- Maintain Elevation Certificates?	Yes		Yes	Yes	Yes	
- # of Repetitive Losses?	0	0		0		
CRS Rating, if applicable	No	N/A	N/A		N/A	
Stormwater Program?	Yes		Yes		Yes	
Building Code Version	2001 CBC	UBC	2001 CBC	2001 CBC	2001 CBC	
Full-time Building Official	Yes	Yes	Yes	Yes	No	
- Conduct "as-built" Inspections?	Yes		Yes	Yes	No	
BCEGS Rating	No	No			No	
Local Emergency Operations Plan	Yes	No		Yes		
Hazard Mitigation Plan	No	No		Yes	No	
Warning System in Place?		No		Yes	No	No
- Storm Ready Certified?	No	No		No	No	
- Weather Radio reception?	Yes			Yes	Yes	
- Outdoor Warning Sirens?	No	No		No	No	
- Emergency Notification (R-911)?	Yes			No	No	
- Other? (e.g., cable over-ride)	No			HT Radio/CATV	No	
GIS System?	Yes	No	No	Yes	No	No
- Hazard Data?	No	No	Limited	No	No	No
- Building footprints?	No	Some	Some	No	No	No
- Tied to Assessor data?	Yes	Yes	Yes	Yes	Yes	No
- Land-Use designations?	Yes	Yes	Yes	Yes	Yes	No
Structural Protection Projects		No	Yes			
Property Owner Protection Projects		No	Yes			
Critical Facilities Protected?		No	N/A	N/A		
Natural Resources Inventory?	No	No			No	No
Cultural Resources Inventory?	No	No			No	Yes
Erosion Control procedures?		Yes	Yes	Yes	No	
Sediment Control procedures?				Yes	No	
Public Information Program/Outlet	No	Yes		Yes	No	
Environmental Education Program?	Yes	Yes		Yes	No	

EXPLANATION OF CAPABILITY ASSESSMENT MATRIX

Comp Plan: Comprehensive Long-Term Community Growth Plan

Land Use Plan: Designates type of Land Use desired/required – Comprised of Zoning

Subdivision Ordinance: Dictates lot sizes, density, setbacks, and construction type.

Zoning Ordinance: Dictates type of Use and Occupancy, Implements Land Use Plan

NFIP/FPM Ord: Floodplain Management Ordinance: Directs development in identified Flood Hazard Areas. Required for Participation in NFIP and Availability of Flood Insurance

Sub. Damage: Does your FPM Ordinance contain language on Substantial Damage/Improvements? (50% rule)

Administrator: Do you have a Floodplain Management Administrator (someone with the responsibility of enforcing the ordinance and providing ancillary services (map reading, public education on floods, etc.)

# of FP Bldgs: How many buildings are in the Floodplain?

# of policies?: How many buildings are insured against flood through the NFIP?

# of RL's: # of Repetitive Losses: Paid more than $1,000, twice in the past 10 years

CRS Rating: Are you in the Community Rating System of the NFIP, and if so, what's your rating?

BCEGS: Building Code Effectiveness Grading System Rating

LEOP: Do you have a Local Emergency Operations Plan – a Disaster RESPONSE Plan?

HM Plan: Do you have a Hazard Mitigation Plan?

Warning: Do you have any type of system, such as "Storm Ready" Certification from the National Weather Service, NOAA Weather Radio reception, Sirens, Cable (TV) Override, "Reverse 911"?

GIS: Geographic Information System

Structural Protection Projects: Levees, drainage facilities, detention/retention basins

Property Protection Projects: Buy-outs, elevation of structures, floodproofing, small "residential" levees or berms/floodwalls

Critical Facility Protection: For example, protection of power substations, sewage lift stations, water-supply sources, the EOC, police/fire stations, medical facilities that are at risk, e.g., in the floodplain.

Natural And Cultural Inventory: Do you have an inventory of resources, maps, or special regulations within the community? (wetlands and historic structures/districts, etc.)

Erosion Or Sediment Control: Do you have any projects or regulations in place?

Public Information And/Or Environmental Education Program: Do you have an ongoing program even if its primary focus is not hazards? Examples would be "regular" flyers included in city utility billings, a website, or an environmental education program for kids in conjunction with Parks & Recreation?

FEDERAL AND STATE CONSIDERATIONS

There are some regional capabilities that should also be considered, and an additional layer of regulations at the state and federal level enhance these local capabilities. The Planning Team also reviewed the following:

The Healthy Forest Restoration Act (HFRA) of 2003

This act created national legislation to focus efforts on reducing wildfire threats to communities, watersheds and wildlife habitat, as well as promoting healthy forest conditions and old-growth-large tree retention. Under this legislation, communities are responsible for developing a Community Fire Plan in order to be eligible for certain funding.

California Department of Forestry & Fire Protection

Primary responsibility is for controlling wildland fires on 283,778 acres of State Responsibility Areas (SRA's) throughout the County (Direct Protection Areas) and fiscal responsibility for an additional 10,767 acres of SRA land which is directly protected by the USFS. The State Board of Forestry identifies SRA lands within the State, without regard to any ownership classification, for the purpose of determining areas in which the financial responsibility of preventing and suppressing wildland fires is primarily the responsibility of the State. The prevention and suppression of wildland fires in all areas not classified as SRA is primarily the responsibility of local or federal agencies (PRC 4125). Every 5 years, the CDF reissues maps identifying the boundaries of the SRA with any modifications approved by the Board of Forestry. The CDF operates four fire stations in Amador County and has substantial additional resources in neighboring counties including aerial resources. The California Youth Authority Camp (CYA) at Pine Grove, operated by the CDF, also provides significant hand crew support for fire fighting and prevention. Amador County contracts with the CDF for fire protection services.

U.S. Forest Service

Primary area of responsibility is wildland fire (not structural fires) on federal land in the eastern portion of the County. The Eldorado National Forest operates one fire station during the season in Amador County cooperatively with CDF at the Dew Drop Fire Station and a second station, technically in El Dorado County, on the Highway 88 corridor at Lumberyard. The Forest Service has access to substantial fire fighting resources in the region. During the fire season, some fire fighting assets are deployed upcountry to the USFS's Lumberyard facility.

Mule Creek State Prison Fire Department

Primary area of responsibility is on the prison property, however, the department often responds to incidents in the vicinity of the prison as needed. The Department has one fire station.

Because wildland fires ignore civil boundaries, it is necessary that cities, counties, special districts, state agencies and federal agencies work together to mitigate the adverse impacts of

wildfires. All Amador County fire fighting organizations are coordinated through automatic and mutual aid agreements to assist each other as needed and are dispatched by the Amador/El Dorado Emergency Command Center (ECC) in Camino in El Dorado County according to a Standard Response Plan (SRP). The ECC will dispatch fire engines, other equipment, and personnel from the closest resources available to fill the requirements of the SRP regardless of jurisdiction. All of the fire fighting personnel in the fire districts and community fire departments are volunteers and most serve without compensation.

AMADOR CITY

General Plan

The General Plan is a document that guides the future development within the City. It contains broad community values and goals, giving a picture of the desired character and quality of development in the County and policies which outline the steps to accomplish those goals. Of primary concern to this planning document is the Conservation and Open Space Elements of the General Plan. This Element, first adopted in 1983, has been updated to reflect changes within the community. Specifically, the Conservation and Open Space Elements is more specific and implementation oriented with respect to protecting open space and natural resources.

Goals, Policies, and Implementation Measures related to hazard mitigation include the following:

Goal #1: To assure the wise use, development and protection of the City's natural and cultural resources and open space lands.

Policies:

- Maintain the current flow characteristics and biotic quality of Amador Creek by minimizing increased flow from impermeable surfaces and controlling encroachment into the stream zone.
- Protect riparian and wetland habitats from unnecessary disturbance with the goal of no net loss.
- Encourage development appropriate to the terrain to limit visual and grading impacts.
- Designate particularly valuable, sensitive, or hazardous areas relative to visual; cultural; historic; recreation; wildlife, fish, or plant habitat; public trails; and publicly owned corridors as Open Space or related protected designation.
- Encourage the use of conservation easements and open space dedications in the City and its surroundings.
- All aspects of new growth and redevelopment shall preserve the sense of a compact, 19th century community in architecture, scale, and other design elements and be compatible with both the overall community and the surrounding neighborhood.
- The Historic Commercial District structures, features, public facilities, and layout shall be preserved to the greatest extent possible in Gold Rush era authenticity.
- Preserve the natural beauty of the City and its surroundings.
- Encourage linking of open space corridors.
- Protect the city's existing trees and woodlands.

Codes and Ordinances

Title 8
HEALTH AND SAFETY
Chapters 8.12 Nuisances Generally

8.12.010 Definitions. As used in this chapter: "Nuisance" includes anything which is injurious to human health, is indecent, or is offensive to the senses. A nuisance interferes with the comfortable enjoyment of life or property. A nuisance affects at the same time an entire community, neighborhood, or a considerable number of persons although the extent of annoyance or damage inflicted upon the individual may be unequal. A nuisance includes all conditions of property including but not limited to, that condition which occurs as a result of the storage, removal, transport, processing or disposal of solid waste. A nuisance includes dry grasses, weeds, dead shrubs, dead trees, rubbish and waste matter that constitute a fire hazard in the R-1, R-2, R-3, R-4, C-l and C-2 zones.

Title 15
BUILDINGS AND CONSTRUCTION

15.04.010 Adoption of Uniform Codes.
A. The following uniform codes are adopted by reference as the rules and regulations governing the construction, alteration, moving, demolition, repair and use of any building or structure within the city, and additions:
1. The Uniform Building Code (UBC) and Uniform Building Code Standards (UBCS, 1991 Edition, as published by the International Conference of Building Officials (ICBO), including, but not limited to, Parts I through XI and the Appendix; excluding Appendix Chapters 1, 12, 23, 38, 51 and 53;
2. The Uniform Plumbing Code, (UPC) 1991 Edition, as published by the International Association of Plumbing and Mechanical Officials including but not limited to Part I: Chapters 1 through 13; Appendices A through I, and the Installation Standards;
3. The Uniform Mechanical Code, (UMC) 1991 Edition, as promulgated by the International Conference of Building Officials and the International Conference of Plumbing and Mechanical officials including but not limited to Parts I through IV; and Appendices A through D;
4. The National Electric Code, (NEC) 1991 Edition, as published by the National Fire Protection Association and the International Conference of Building Officials, including the Uniform Administrative Code provisions, and Chapters 1 through 9; 5. The Uniform Housing Code, (HC) 1991 Edition as published by the International Conference of Building Officials, including only Chapters 1, 4, 5, 6 and Section 701 (b) and (c); 6. The Uniform Swimming Pool, Spa and Hot Tub Code, 1991 Edition, as published by the International Allocation of Plumbing and Mechanical officials, including, but not limited to, Chapters 1 through 5; excluding Part 1 Administration (Part I Administration of the UBC shall apply;
7. The Uniform Administrative Code (UAC) 1988 Edition, as published by the International Conference of Building Officials, including Chapters 1, 2, and 3.
B. The following codes are adopted by reference as standards in conjunction with subsection A of this section:

1. Uniform Fire Code, 1991 Edition as published by the International Conference of Building Officials and Western Fire Chiefs Association;
2. National Fire Codes, 1991 Edition and Supplement as published by the National Fire Protection Association;

Title 16
SUBDIVISIONS

16.10.120 Soils and/or hazardous materials report.
A. A preliminary soils report and/or a hazardous materials report prepared by a civil engineer or engineering geologist registered in California, and based upon adequate test boring and/or other testing or analysis, may be required by the city engineer for any subdivision for which a final map is required by this title.
B. When the city engineer determines that a preliminary soils report is necessary, the planning commission may include the preparation of such report as a condition of approval of the tentative map.
C. When the preliminary soils report indicates the presence of critically expansive soils or other hazardous soils problems which, if not corrected or adequately addressed, would lead to structural defects, a soils investigation of each lot in the subdivision may be required.
D. Soils investigation shall be done by a professional engineer or engineering geologist of proper registration in California, who shall recommend the corrective actions necessary to prevent structural damage to structures proposed to be constructed in the area where such soils problems exist. (Ord. 159 (part), 2005)

16.16.170 Storm drainage.
The subdivider shall dedicate right-of-way for storm drainage purposes conforming substantially with the lines of any natural water course or channel, stream, or creek that traverses the subdivision. All storm drain improvements shall be in accordance with city improvement standards. The planning commission may require adequate fencing or other protection of all ditches and streams. Where drainage facilities are necessary on an area-wide basis to permit safe, healthful and convenient development of the area, the subdivider may be required to pay a pro rata share of such facilities' cost, as determined by the city council. (Ord. 159 (part), 2005)

16.16.180 Grading and erosion control.
All grading and erosion control shall be in accordance with applicable provisions of the Uniform Building Code and an approved erosion control plan. Erosion control plan shall implement "best management practices" that will prevent construction pollutants from contacting storm water. All products of erosion shall be prevented from moving off-site into receiving waters. Construction practices shall be in accordance with an approved erosion control plan and methods contained in "Volume 3 of California Storm Water Best Management Practice Handbook." (Ord. 159 (part), 2005)

CITY OF IONE

General Plan

The General Plan is considered a guide for decision-making concerning long-term physical development. The plan recognizes that environmental impacts of growth must be mitigated at the regional scale. The plan also recognizes natural hazards as a constraint to growth. The following summarizes elements of the plan related to mitigating natural hazard impacts.

2.01 Implementation Measure. Prohibit development in the floodplain except where structure are sited so as to avoid flood risks and to preserve riparian habitat.

Safety Element

8.00 Goal: Provide a safe and hazard free environment

8.1 Policy: Support ongoing emergency planning with respect to the Ranch Seco Plant

8.2 Policy: Develop and maintain an effective fire prevention planning program

8.3 Policy: Identify areas in need of sidewalk improvement and pursue development thereof

8.4 Policy: Pursue improvements to curbs, gutters, and storm drains in identified problem areas

8.5 Policy: Drainage and flood control should be addressed in subdivision maps and/or site plans or any development plan

8.6 Policy: New development shall not overextend safety services (police and fire)

8.01 Implementation Measure: Continue the program of fire inspections and controlled burns and other fire prevention measures in the City.

8.02 Implementation Measure: Enforce Uniform Building Code requirements regarding fire safety.

8.03 Implementation Measure: Require that any development in a chaparral environment be separated from natural vegetation by a maintained greenbelt or other appropriate fire buffer.

8.04 Implementation Measure: Encourage the use of housing rehabilitation programs to eliminate health and safety hazards in residences.

8.05 Implementation Measure: Establish and maintain a program and timetable for sidewalk and drainage improvements.

8.06 Implementation Measure: Require use of smoke detectors in all new residences or old residences before they may be resold.

8.07 Implementation Measure: Encourage the preservation of trees and the development and maintenance of landscaping in all new development to reduce fire hazards.

8.08 Implementation Measure: Prohibit development in floodplain except where mitigation measures as set forth in the Ione Municipal Code Chapter 17.04 have been implemented.

8.09 Implementation Measure: Adopt a flood hazard overlay zone as part of the comprehensive zoning revision required after the adoption of the general plan.

8.10 Implementation Measure: Work with PG&E, Amador County, and local private interests to improve water service so that minimum fire flows as set forth P.U.C. General Order 103 may be met.

8.11 Implementation Measure: Determine the ongoing incremental costs and capital costs of providing public safety services and assign equitable shares to new and existing development.

8.12 Implementation Measure: Continue to improve the emergency communication network in Ione through coordination with the Amador County Office of Emergency Services.

9.00 Goal: Provide an environment for city residences which is safe from seismic concerns and other geologic hazards.

9.1 Policy: Placement and construction of future structures shall be carefully monitored with respect to existing codes and regulations.

9.01 Implementation Measure: Enforce Uniform Building Code Section 2312 regarding seismic safety in new building construction.

9.02 Implementation Measure: The potential for ground rupture, land sliding and differential settlement shall be reviewed as part of all subdivision map approval.

9.03 Implementation Measure: No slopes shall be undercut or oversteepened (greater than 30%) as part of new building or road construction and existing hazard areas shall be regarded to eliminate this hazard before subsequent construction takes place.

9.04 Implementation Measure: All earth work shall conform to Uniform Building Code Chapter 70 to avoid creation of unstable slopes.

9.05 Implementation Measure: Proposed construction over artificial fill mine excavations, or mine tailings shall be closely monitored through soils reports and geologic review of grading plans and avoided if possible.

9.06 Implementation Measure: Enforce the Hazardous Building Abatement Ordinance (Section 1) to eliminate potential seismic hazards resulting from unsafe buildings.

Codes and Ordinances

Title 8: Health and Safety

8.16 Weed and Rubbish Abatement. This ordinance provides for the regulation and abatement of nuisances which includes "all weeds, dry grasses, dead shrubs, dead trees, rubbish or any material growing upon the streets, sidewalks, or upon private property within the City, which bear seeds of wingy or downy nature or which by reason of their size…constitute a fire hazard…"

Title 15: Buildings and Construction – Adopted by Reference

15.04 Uniform Building Code
15.08 Uniform Housing Code
15.12 Uniform Electrical Code
15.16 Uniform Plumbing Code
15.20 Uniform Fire Code
15.24 Uniform Code for Abatement of Dangerous Buildings
15.28 Uniform Mechanical Code
15.32 Uniform Sign Code

CITY OF JACKSON

General Plan

Land Use Element, October 2004.

This element is intended to be used as the blueprint for planning development in the City of Jackson for the next 20 years. The purpose of the Land Use Element is to establish the framework to direct the physical development of the City and to form the organization of the City's environment. The associated Land Use Designations Map identifies the locations and land use categories with the City of Jackson. The Land Use Element establishes the function and form of the City because it is a composite statement of the goals, strategies and actions of the other elements of the General Plan.

As part of the Land Use Element, four overlay land uses designations have been developed primarily for the purpose of providing extra protection to sensitive areas which the city officials and citizens wish to have preserved or avoided. The overlay designations provide additional development requirements to properties located within overlay beyond the requirements of the base or combined land use designation. The overlays include the following:

Creek/Floodplain Overlay. The purpose of the Creek/Floodplain Overlay is to promote open space along the City's numerous creeks, to encourage public use of many of these creeks, and to discourage development in areas designated as a floodplain. The boundary of the Creek/Floodplain overlay shall be contiguous with the Federal Emergency Management Agency's 100-year floodplain Boundary (FIRM Flood Insurance Rate Map - Community Panel Number 060448 0001 D received on July 17, 1997).

Visual Corridor Overlay. The creation of the Visual Corridor Overlay is to protect the scenic views enjoyed by everyone as they enter the City of Jackson from both the north and south of town. The purpose of the Visual Corridor Overlay is not to restrict development in these areas, but to provide development guidelines to promote development in an aesthetically pleasing manner which will neither add nor detract from the viewshed.

Historic Corridor Overlay. The purpose of the Historic Corridor Overlay is to protect historic features which exist within the City. The Historic Corridor Overly is applied to primarily residential areas which have a great amount of historic structures. New construction or redevelopment within the Historic Corridor shall be consistent with the late nineteenth century character of the Jackson area and shall meet certain criteria.

Land Use Element: Goals and Policies
The following goals and policies contained in the Land Use Element are a combination of views and suggestions gathered at the City's Neighborhood and Steering Committee meetings.

Goal 1: The City of Jackson shall be allowed to grow as long as the growth is in a manner which is not detrimental to its neighborhoods.

Policy 1.4: A hazards study shall be performed for the purpose of outlining areas considered hazardous due mainly to historic mining operations. Once identified, these areas will be designated in a Hazards Overlay to be incorporated into this Land Use Element. New development standards for properties within this overlay shall be developed to protect the City's citizens from exposure to hazardous materials.

Goal 2: The City of Jackson has numerous natural and historic features. These features shall be enhanced if necessary and protected.

Policy 2.5: Limit new development within the Creek/Floodplain overlay by requiring new development proposed within the overlay to obtain Planning Commission approval.

Codes and Ordinances

Title 8 ~ 8.00 Health and Sanitation

8.12 Weed Abatement. This ordinance provides for the declaration and abatement of Nuisances to include, "any brush or weeds which attain such large growth as to become, when dry, a fire menace to adjacent improved property".

Title 14 ~ 14.00 Buildings and Construction

14.04 Uniform Codes. The Uniform Building Code (1994), the Uniform Plumbing Code (1994), the Uniform Housing Code (1994), the National Electric Code (1994), the Uniform Mechanical Code (1994), and the Uniform Code for the Abatement of Dangerous Buildings (1994) are adopted by reference.

14.08 Uniform Fire Codes. The Uniform Fire Code (1994) is adopted by reference.

14.20 Floodplain Management.

14.20.050 Definitions. "Floodway" means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one foot.
"Substantial damage" means damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed fifty percent of the market value of the structure before the damage occurred.

14.20.170 Standards of construction.
C. Elevation and Floodproofing.
1. Residential construction, new or substantial improvement, shall have the lowest floor, including basement:
a. In an AO zone, elevated above the highest adjacent grade to a height equal to or exceeding the depth number specified in feet on the FIRM, or elevated at least two feet above the highest adjacent grade if no depth number is specified. The state of California recommends that the lowest floor be elevated above the highest adjacent grade to a height exceeding the depth number

specified in feet on the FIRM by at least one foot, or elevated at least three feet above the highest adjacent grade if no depth number is specified.
b. In an A zone, elevated to or above the base flood elevation, as determined by this community. The state of California recommends the lowest floor be elevated at least one foot above the base flood elevation, as determined by the community.
c. In all other zones, elevated to or above the base flood elevation. The state of California recommends the lowest floor be elevated at least one foot above the base flood elevation.
2. Nonresidential construction shall either be elevated to conform with Section 14.20.17(C)(1) or together with attendant utility and sanitary facilities:
a. Be floodproofed below the recommended elevation]
b. Have structural components capable of resisting hydrostatic and dydrodynamic loads and effects of buoyancy; and
c. Be certified by a register engineer.

14.20.220 Floodways. Since the floodway is an extremely hazardous area due to the velocity of flood waters, the following provisions apply:
A. Prohibit encroachments, including fill, new construction, substantial improvement, and other new development unless certification by a register professional engineer or architect is provided demonstrating the encroachments shall not result in any increase in the base flood elevation.

14.20.240 Mudslide. A. The floodplain administrator shall review permits for proposed construction of other development to determine if it is proposed within a mudslide area.
B. Permits shall be reviewed to determine that the proposed site and improvement will be reasonably safe from mudslide hazards.

14.20.250 Flood-related erosion-prone areas. A. The floodplain administrator shall require permits for proposed construction and other development within all flood-related erosion-prone areas as known to the community.
B. Permit applications shall be reviewed to determine whether the proposed site alterations and improvements will be reasonably safe from flood-related erosion and will not cause flood-related erosion hazards or otherwise aggravate the existing hazard.

CITY OF PLYMOUTH

Emergency Operations Plan, 2006

The plan is designed to provide a comprehensive, multi-use, emergency management program for the City of Plymouth, in an effort to: lessen the effects of hazards, enhance response during emergencies, provide necessary assistance to citizens, prepare for measures to be taken which will preserve life and minimize damage, and establish a recovery system in order to return the City to normal operations as soon as feasible.

CITY OF SUTTER CREEK

City Projects

The City has many completed and planned projects that focus on minimizing future losses associated with identified hazards. These include the following:

Flood Control Projects

- Old Sutter Hill Road Hazard Elimination project was completed in 2000-2001 at a cost of $450k to restore and upsize drainage along the Old Sutter Hill Road and Bryson Drive drainage area.
- Drainage project planned for the China Gulch area from the Sutter Creek fire hall to Badger Street/Spanish intersection. This project will either be completed as part of proposed development for the area or will be done as part of a grant.

Multi-Hazard Mitigation Plan
5.0 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 Amador County's Multi-Hazard Mitigation Plan. This Section describes how the County accomplished Step 3 of FEMA's 4 Step guidance: "Developing the Mitigation Plan" and includes the following CRS steps from the older 10-step guidance:

Step 6: Set Planning Goals
Step 7: Review Possible Activities
Step 8: Draft an Action Plan

5.1 GOALS AND OBJECTIVES

Up to this point in the planning process, the HMPC has organized resources, assessed natural hazards and risks, and documented mitigation capabilities within the County and participating jurisdictions. A profile of Amador County's vulnerability to natural hazards resulted from this effort, which is documented in the preceding chapters of this plan. The resulting goals, objectives, and mitigation actions were developed based on this profile. The HMPC developed this section of the plan with a series of meetings and exercises designed to achieve a collaborative mitigation planning effort as described further in this section.

During the initial goal setting meeting, AMEC reviewed the results of the hazard identification, vulnerability assessment and capability assessment with the HMPC. This analysis of the Risk Assessment identified areas where improvements could be made, providing the framework for the HMPC to formulate planning goals objectives and the ultimate mitigation strategy for the County.

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

- Are time-independent, in that they are not scheduled events.

Goals are stated without regard for implementation, that is, implementation cost, schedule, and means are not considered. Goals are defined before considering how to accomplish them so that the goals are not dependent on the means of achievement. Goals statements form the basis for objectives and measures that will be used as means to achieve the goals. Objectives define strategies to attain the goals, and are more specific and measurable.

Team members were given a list of sample goals to consider. The HMPC was instructed that they could use, combine or revise the statements they were provided or develop new ones on their own, keeping the risk assessment in mind. Team members were provided three index cards each and asked to write a goal statement on each card. Goal statements were collected and grouped into similar themes and pasted onto the wall of the meeting room. The goal statements were then attached to the meeting-room wall, and grouped into similar topics. New goals that represented the team's input were written until consensus was formed amongst the team. Some of the statements were determined to be better suited as objectives or actual mitigation projects, and were set aside for later use. Using this information, objectives were then developed, based on the team's input that summarizes strategies to achieve each goal. Initial mitigation recommendations that were developed by the HMPC are listed under the appropriate Goal and Objective. As part of the prioritization process described later in this section, prioritized mitigation measures were further developed into projects as part of the overall mitigation strategy for this plan.

Based upon the risk assessment review and goal setting process, the HMPC developed the following goals with several objectives and associated mitigation measures. These goals and objectives provide the direction for reducing future hazard-related losses within Amador County.

GOAL 1: Provide Protection for People's Lives from Hazards

Objective 1.1: Increase public awareness about the nature and extent of hazards they are exposed to, where they occur, and recommend responses to identified hazards (create/continue an outreach program, provide educational resources and training)

Objective 1.2 Identify and resolve impediments to implementation of recommended mitigation strategies

GOAL 2: Improve County Capability to Mitigate Hazards and Associated Losses

Objective 2.1: Reduce Wildfires/Protect Life and Property from Damaging Wildfires

2.1.1 Promote fire safety
2.1.2 Manage high hazard forest fuels to reduce wildfire intensity
2.1.3 Increase voluntary compliance with defensible space requirements
2.1.4 Increase capacity of infrastructure to respond to wildfires

Objective 2.2: Reduce Flood and Storm-Related Losses (i.e., damages and closures)

2.2.1 Provide/Improve roadside drainage systems

2.2.2 Implement a paving or chip scaling program on "critical" gravel-based roads

2.2.3 Implement a countywide ditch cleaning schedule that occurs every three years on each identified road

Objective 2.3: Reduce Hazards that Adversely Impact the Agricultural Industry

Objective 2.4: Protect Public Health

2.4.1 Increase storage and treatment capacity during flood events

2.4.2 Expand surface water supply for times of drought

GOAL 3: Maintain/Provide for FEMA Eligibility and Work to Position County for Grant Funding

Objective 3.1: Provide County departments with information regarding mitigation opportunities

Objective 3.2 As part of Plan implementation, review projects in this plan on an annual basis to be considered for annual FEMA PDM-C grant allocations or after a presidential disaster declaration in California for HMGP funding.

5. 2 IDENTIFIED MITIGATION MEASURES AND ALTERNATIVES

In order to identify and select mitigation measures to support the mitigation goals, each hazard identified in Section 4.1 was evaluated. Only those hazards that pose a threat to the community were considered further in the development of hazard specific mitigation measures. These hazards include:

- Floods
- Wildfire
- Agricultural Hazards
- Drought
- Severe Weather
    - ♦ Heavy Rains/thunderstorms/Wind/Hail/Lightning

The HMPC eliminated the hazards identified below from further consideration in the development of mitigation measures, either because the risk of the hazard occurring within the County is unlikely or non-existent or if they do occur, the vulnerability of the County is low or existing capability measures were in place to mitigate the affects of these hazards. The eliminated hazards include:

- Avalanche
- Dam Failure
- Earthquakes
- Landslides and Rockfalls
- Natural Health Hazards
    - ♦ West Nile Virus
    - ♦ Rabies
- Severe Weather
    - ♦ Extreme Temperatures
    - ♦ Fog
    - ♦ Snow
    - ♦ Tornadoes
- Land Subsidence
- Volcanic Eruption

It is important to note, however, that all above identified hazards are included in the County-wide Multi-Hazard Public Awareness measure.

Once it was determined which hazards warranted the development of specific mitigation measures, the HMPC analyzed a set of viable mitigation alternatives that would support identified goals and objectives. Each HMPC member was provided with the following list of categories of mitigation measures that are based on the six CRS categories:

- Prevention,
- Property Protection,
- Structural Projects,
- Natural Resource Protection,
- Emergency Services, and
- Public Information.

The HMPC members were also provided with several lists of alternative multi-hazard mitigation actions for each of the above categories. A facilitated discussion then took place to examine and analyze the alternatives. With an understanding of the alternatives, a brainstorming session was conducted to generate a list of preferred mitigation actions to be recommended.

Prioritization Process

Once the mitigation actions were identified, the HMPC members were provided with several sets of decision-making tools, including FEMA's recommended STAPLE/E set, 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 then another. In accordance with the DMA requirements, an emphasis was placed on the importance of a cost-benefit analysis in determining project priority. The lists of mitigation categories, multi-hazard measures, and criteria sets are included in Appendix C.

With these criteria in mind, team members were given a set of nine colored dots, 3 each of red, blue, and green. The dots were assigned red for High priority, blue for Medium priority, and green for Low priority. The Team was asked to use the dots to prioritize projects with the above criteria in mind. This process provided both consensus and priority for the HMPC recommendations.

After completion of this exercise and much discussion, the HMPC decidedly chose not to prioritize the recommended actions - for two reasons. First, the HMPC did not want to rank apples and oranges between communities and departments. Each community has their own recommended actions in their own section and will have to determine how to identify their own priorities. The priority assigned for each recommendation is an indication of how the project ranks in priority within the community making the recommendation. Second, the CA-OES state Hazard Mitigation Plan states their own criteria for funding local projects, so the HMPC ranking

holds little weight compared to the state's. The DMA regulations state that Benefit-Cost (B/C) is the #1 method by which projects should be prioritized. In the state ranking, the B/C criteria are one of 10, and while they do not state what their overall priority is, B/C is listed last.

Recognizing the DMA regulatory requirement to prioritize by Benefit-Cost and the need for any publicly funded project to be cost-effective, the HMPC decided to pursue implementation according to when and where damages occur, available funding, individual community priority, and priorities identified in the State Mitigation Plan. This process drove the development of a prioritized action plan for Amador. Cost effectiveness will be considered in additional detail when seeking FEMA mitigation grant funding for eligible projects associated with this plan.

5.3 THE MITIGATION STRATEGY

The results of the planning process, the Risk Assessment, the Goal Setting, the Identification of Mitigation Measures, and the hard work of the HMPC led to the Action Plan that follows. The process also helped the HMPC clearly comprehend and identify the overall mitigation strategy that will lead to the implementation of the Action Plan. Taking all of the above into consideration, the HMPC has developed this **overall mitigation strategy**:

- COMMUNICATE the hazard information collected and analyzed through this planning process so that the community better understands what can happen where, and what they can do themselves to be better prepared. Also, publicize the "success stories" that are achieved through the HMPC's ongoing efforts,

- IMPLEMENT the Action Plan recommendations of this plan;

- UTILIZE existing rules, regulations, policies and procedures already in existence. Communities can reduce future losses not only by pursuing new programs and projects, but also by more stringent attention to what's already "on the books", and

- MOM - ardently monitor "Multi-Objective Management" opportunities, so that funding opportunities may be shared and "packaged" and broader constituent support may be garnered.

5.4 MITIGATION ACTION PLAN

This Action Plan was developed to present the recommendations developed by the planning team for how Amador County can lessen the vulnerability of people, property, infrastructure, and natural and cultural resources to future disaster losses. The Action Plan summarizes who is responsible for implementing each of the prioritized strategies determined in the previous step, as well as when and how the actions will be implemented. The Recommended Mitigation Actions that follow are organized by jurisdiction. Each recommendation also includes a discussion of the benefit-cost to meet the regulatory requirements of DMA.

It is important to note that Amador has numerous existing, detailed project descriptions, including cost estimates and benefits, in other Planning documents such as those found in the Amador Fire Plan and identified in Capital Improvement Budgets and Reports. These projects are considered to be part of this plan and the details, to avoid duplication, should be referenced in their original source document. Amador also realizes that new project needs and priorities may arise as a result of a disaster or other circumstances, and reserves the right to support these projects, as necessary, as long as they conform to the overall goals of this plan.

AMADOR COUNTY RECOMMENDED MITIGATION ACTIONS

EMERGENCY SERVICES MITIGATION ACTIONS

ACTION #1: DEVELOP AND CONDUCT A MULTI-HAZARD SEASONAL PUBLIC AWARENESS PROGRAM PROVIDING CITIZENS AND BUSINESS WITH ACCURATE INFORMATION DESCRIBING RISK AND VULNERABILITY TO NATURAL HAZARDS, IMPLEMENTED ON A ANNUAL BASIS

Issue/Background: Amador 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. This public outreach effort should include the following elements:

- Utilize a variety of information outlets including local news media, creating and printing of brochures and leaflets, water bill inserts, websites and public service announcements. Current brochures and flyers should be put on display in County office buildings, libraries and other public places.

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

Other Alternatives: Continue public information activities currently implemented.

Responsible Office: Amador County Sherriff's Office of Emergency Services, American Red Cross, Amador Fire Safe Council, Chamber of Commerce

Priority (High, Medium, Low): Medium

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

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

Potential funding: HMPG, PDM

Schedule: Part of seasonal multi-hazard public awareness campaign

ACTION #2: PURCHASE NOAA WEATHER RADIOS FOR ALL CITIES AND THE SCHOOL DISTRICT AS PART OF NOAA'S STORM-READY PROGRAM

Issue/Background: Real-time monitoring of weather events will provide an opportunity for cities and the school district to assess potential danger/hazards to their jurisdictions and to react appropriately. For schools, evacuating hundreds of students from a site involves massive transportation planning. Early warning through the NOAA radios would give jurisdictions a slight jump on evaluating any imminent danger and would allow for a more organized plan of action if the situation warrants.

Other Alternatives: Stand AM/FM radio broadcasts and/or television broadcasts

Responsible Office: Amador County Unified School District Superintendent, City Managers and the Amador County Sheriff's Office of Emergency Services

Priority (High, Medium, Low): Medium

Cost Estimate: Five cities plus 15 school sites @ $80.00 each for a total of $1,200

Benefits (avoided Losses): Potential savings in property damage and/or loss of life due to early warning and response to an event

Potential funding: General Fund or as otherwise identified

Schedule: Fiscal Year 06-07, subject to funding

ACTION #3: PRC 4290 COMPLIANT STREET AND ADDRESS SIGNAGE FOR RURAL AREAS

Issue/Background: Many homes in Amador County are on private roads and do not have adequate street signage. In addition, many more homes in rural Amador County do not have adequate house signage, which makes it difficult for emergency responders to quickly locate addresses requesting assistance.

Homeowners either are unaware that their road signs and/or house signs are not adequate, do not know where to go to purchase PRC 4290 compliant signs, or balk at spending what it costs to obtain such a sign.

Other Alternatives: The only other alternative is no action.

Responsible Office: California Department of Forestry and Fire Protection, Amador Fire Protection District, Amador County Sheriff's Office of Emergency Services

Priority (High, Medium, Low): High

Cost Estimate:
Private Roads: There are 350 privately owned roads in the county. The proposed project would provide funding for road signs and poles at $75 per for a total cost of $50,000 (includes duplicate signs for intersections).

Existing Homes: Cost of a single PRC 4290 compliant sign is about $30 plus $5 for a stake. The proposed project would provide cost-share funds with homeowners paying $5 to $10 per sign (plus stake). There are approximately 3,500 homes that may need signage. Cost of project is $70,000 to $87,000. (The grant amount would have to be adjusted to include funds for administration of grant).

New Homes: County building inspector will require installation of PRC 4290 compliant address signs prior to issuing final use permit. These signs are already required by County Code.

Benefits (avoided Losses): Homeowners have no easy access to a source for PRC 4290-compliant signage. They have to do research to find a place to buy them and then they have to be willing to pay $35 per sign and install it once they receive it. This project would remove all of the above obstacles, and thereby facilitate emergency responders in locating addresses quickly.

The longer the response time, the greater the potential damage:

Structure fires attacked within 10 minutes of ignition have the greatest possibility of rapid extinguishments, and thus a decrease in potential life and property loss as well as reducing the likelihood that a house fire will spread to the wildlands.

Vegetation fire ignitions must be attacked quickly or they can rapidly become quite large, depending on the amount and condition of the vegetation, the relative humidity, and wind.

Without medical intervention, certain death can occur in persons with heart attack, severe bleeding, and respiratory ailments in as little as four to six minutes.

Potential funding: Possible funding sources are National Fire Plan or Title III funds from the Secure Rural Schools and Community Self-Determination Act of 2000 payments to Amador County.

Schedule: Initiate within the next 2 years.

ACTION #4: GIS BASED MAPPING OF PERTINENT INFORMATION THAT CAN BE USED BY ALL AGENCIES IN THE DEVELOPMENT OF PRE-PLANNING AND DURING EMERGENCY INCIDENTS

Issue/Background: The County of Amador is in the process of establishing a GIS department. To date, GIS work has been done by individual departments based on available funding, the departments mission, and with little coordination with other departments. Establishing a GIS department will allow for a more coordinated effort and eliminate duplication of efforts. Additional information needs to be gathered for layers that are of benefit in pre-planning for emergencies or mitigating such emergencies. Some of these layers would include: critical facilities, water systems, sewer systems, storm water system, fire hazard zones, fire evacuation areas, fire hydrant locations and flow information, and police response zones.

Other Alternatives: Continue to rely on older county maps created by hand with outdated information

Responsible Office: County Assessor's Office, Public Works Department, Information Technologies Department

Priority (High, Medium, Low): High

Cost Estimate: It is estimated that $25,000 will be needed to gather information needed to develop additional layers to a point where maintenance will be the only requirement to keep the information up to date.

Benefits (avoided Losses): It is difficult to put an exact cost benefit from such a project. Identification of critical infrastructure and use in pre-planning for emergencies would be the greatest benefit. A GIS system is most cost effective in maintenance and updating since it will only require data entry to an already established system. Such a system could also interface with other regional agencies and provide easy access for critical information sharing.

Potential funding: Unknown at this time

Schedule: Fiscal Year 07-08, subject to funding

WILDFIRE MITIGATION ACTIONS

ACTION #5: MT ZION CAMERA PROJECT

Issue/Background: The Amador Fire Safe Council has provided funding for the staffing of a lookout tower. The council does this by selling internet access to four fixed video cameras the council installed on the tower. The internet access to the cameras has proven popular with county residents. However, it is becoming more difficult for the council to raise the $39,000 annually needed to pay for the lookout staff.

Previously, staffed by the California Department of Forestry and Fire Protection (CDF), Mt Zion is the only lookout located in the populated area of the county and accounts for nearly 40% of all first reports of wildfires within the county. When budget cuts forced CDF to close the lookout, the council developed its fundraiser.

CDF is using the same automated camera system currently in use in South Africa on one of its lookouts in an adjoining county. This system feeds directly into CDF's local dispatch center. Adding a second camera will provide the lookout cross reading necessary to accurately determine fire location. This camera rotates giving a 360 degree view of the lookouts "seen" area and has the ability to zoom in on any suspected fire.

There is an annual fee for maintaining the software required to operate the system. The fee is only a fraction of the $39,000 currently required to provide human lookouts.

Other Alternatives: None.

Responsible Office: Amador Fire Safe Council

Priority (High, Medium, Low): High

Cost Estimate: The cost estimate is $20,000 for the equipment and installation. Continuing software maintenance cost will be provided through public subscription for internet access to the camera's images.

Benefits (avoided Losses): Provides a replacement for the wildfire detection system lost due to budget cutbacks. Quick detection of wildfire is one key to keeping fire loses low in the wildland interface.

Potential funding: Federal and state grants.

Schedule: This is a one time installation that requires only a few weeks to accomplish.

ACTION #6: COMMUNITY WILDFIRE PROTECTION PLANS (CWPP)

Issue/Background: The Amador County Generic Wildfire Protection Plan divides the county into nine distinct areas. Each of these areas is rated as to its relative risk from wildfire. The next step in the planning process is to develop CWPP's for each of these nine areas. These plans will contain area specific mitigation measures to protect life and property from wildfire.

Risk Matrix	Assets At Risk	Weather	Slope	Residential Distribution	Hazardous Fuels Distribution	Ladder Fuel Distribution	Composite Score	Overall Ranking
Plymouth	9	6	8	8	7	7	45	7
Ione	8	8	9	4	8	8	45	7
Camanche	7	7	7	6	9	9	45	7
Jackson	4	5	6	3	6	6	30	6
Sutter/Amd.	5	4	4	5	5	5	28	5
Fiddletown	6	3	5	7	3	3	27	4
Pine Grove	3	3	2	1	2	2	13	2
Pioneer/Vol.	1	2	3	2	1	1	10	1
Upcountry	2	1	1	9	4	4	21	3

Other Alternatives: Without these nine area specific plans, the county will be forced to use its generic plan which, while a valuable first step, is not specific enough nor did it have the participation of stakeholders envisioned by the CWPP planning process.

Responsible Office: Amador Fire Safe Council

Priority (High, Medium, Low): High

Cost Estimate: The cost estimate is $50,000 per plan or $450,000

Benefits (avoided Losses): Community involvement in development of a CWPP is crucial if the plan is to be accepted and implemented. It is anticipated that at a minimum the potential for loss of life and loss of property will be substantially decreased and firefighter safety will be increased. However, additional benefits of changes in development patterns, county general plan, construction standards, improvements in fire protection systems, and community awareness of the wildfire threat will flow from the planning process.

Potential funding: Federal and state grants.

Schedule: The council can manage no more than two CWPP development processes a year. The council would schedule them in order of importance in its risk matrix.

ACTION #7: PRIMARY DEFENSIBLE FUEL PROFILE ZONES (DFPZ)

Issue/Background: These projects are identified in Amador County's Generic Community Wildfire Protection Plan and are designed to create "Defensible Fuel Profile Zones" and initial fuel modification areas where overstory crowns need to be thinned and where surface and ladder fuels will be significantly reduced. DFPZ's are linier treatments that typically concentrate fuels reduction treatments along the top of major or strategic topographic ridgelines on the upper 2/3rds of the slope and are "feathered" back, or receive less intensive treatments lower portions of the slope.

Project Name	Miles	Acres	Project Name	Miles	Acres
Sutter Creek Rancho	2.5	91	Antelope South	2	73
Piccardo Ranch	3.4	125	American Flat	5.5	203
Black Gulch	2.1	76	Wetzel	4.5	164
Bonnefoy	1.1	41	Pine Acres	10.7	365
Shake Ridge Road West	4	48	Surrey/Lupe	3.1	114
Quartz Mt.	2	72	Lupe Road	1.9	23
Amador/Quartz	2	72	Hale/Rancheria East	2.5	30
Hale/Rancheria West	3.8	138	Hale/Rancheria South	2	24
Stoney Creek	2.6	94	Defender Grade	3	97
Ponderosa Way North	1.2	45	Ponderosa Way South	1.7	60
Fiddletown Road	8	99	Rams Horn/ Shake Ridge	6.5	139
Pioneer Trail West	2.5	91	**Totals:**	**80.1**	**2393**

Other Alternatives: None

Responsible Office: Amador Fire Safe Council

Priority (High, Medium, Low): High

Cost Estimate: Current fuelbreak construction cost run on average $1,000/acre for a total of $2,393,000

Benefits (avoided Losses): When completed, these projects will break large blocks of hazardous forest fuels into smaller blocks. The goals are to: (1) confine wildfire to the fuel block of origin, (2) separate residential developments from the undeveloped wildlands, and (3) provide safe areas for firefighters.

Potential funding: Federal and state grants. It may be possible to combine federal grant monies as the landowners 25% cost share for participation in the California Forest Improvement Program.

Schedule: The council can manage $700,000 to $1,000,000 in fuel modification projects annually. Assuming funding is available in 2007 the work can be accomplished by 2010.

ACTION #8: DEFENSIBLE SPACE

Issue/Background: Efforts to gain consistent and widespread compliance with defensible space requirements in Amador County have been less than successful for a variety of reasons. A new paradigm is necessary to address this issue. AFSC proposes to work with a partner who has a proven track record in behavior messaging for public and private enterprises. It is proposed that the Amador Fire Safe Council engage in a demonstration project to:

1. Totally rethink the issues surrounding fire safety and the adequate removal of specified dangerous fuels.
2. Conduct research to discover internal drivers that would motivate a significantly higher level of fire safety participation within both residential and business properties.
3. Interview identified businesses that would participate and reinforce the identified internal drivers.
4. Create a comprehensive plan, based on these new internal drivers for Amador County, which would allow for the careful analysis of each of the new drivers to be tested to determine their usefulness for the future.
5. Ensure that all elements of the plan are both cost effective (and cost appropriate) and designed for implementation in other counties.
6. Conduct a program through one fire season to determine the effectiveness of the various elements of the proposed plan.
7. Conduct a post-season analysis to determine which elements of the program were effective and which were not effective.

Other Alternatives: Home inspection by the California Department of Forestry and Fire Protection (CDF). Due to the large number of homes and businesses requiring annual inspections, CDF only inspects a fraction of the structures susceptible to wildfire.

Responsible Office: Amador Fire Safe Council

Priority (High, Medium, Low): High

Cost Estimate: The cost estimate is $50,000 for phase I and $100,000 for phase II

Benefits (avoided Losses): Compliance with the clearance standards of California's Public Resources Code 4291 is the single most effective means of mitigating the damage to property from wildfire. The Amador County Generic Wildfire Protection Plan contains the goal of 90% voluntary compliance with the clearance requirements. Project outcomes will be shared with other fire safe councils.

Potential funding: Federal and state grants.

Schedule: As funded is available

ACTION #9: MAINTENANCE OF PRIMARY DEFENSIBLE FUEL PROFILE ZONES

Issue/Background: These projects are identified in Amador County's Generic Community Wildfire Protection Plan and are designed to create "Defensible Fuel Profile Zones" and initial fuel modification. Most are not yet constructed. Some are being constructed with either state or federal grant monies. To maintain their viability, these projects require periodic maintenance.

Project Name	Miles	Acres	Project Name	Miles	Acres
Sutter Creek Rancho	2.5	91	Antelope South	2	73
Piccardo Ranch	3.4	125	American Flat	5.5	203
Black Gulch	2.1	76	Wetzel	4.5	164
Bonnefoy	1.1	41	Pine Acres	10.7	365
Shake Ridge Road West	4	48	Surrey/Lupe	3.1	114
Quartz Mt.	2	72	Lupe Road	1.9	23
Amador/Quartz	2	72	Hale/Rancheria East	2.5	30
Hale/Rancheria West	3.8	138	Hale/Rancheria South	2	24
Stoney Creek	2.6	94	Defender Grade	3	97
Ponderosa Way North	1.2	45	Ponderosa Way South	1.7	60
Fiddletown Road	8	99	Rams Horn/ Shake Ridge	6.5	139
Pioneer Trail West	2.5	91	**Totals:**	**80.1**	**2393**

Other Alternatives: None

Responsible Office: Amador Fire Safe Council

Priority (High, Medium, Low): High

Cost Estimate: Current fuelbreak maintenance cost are estimated at $500/acre for a total of $1,196,500

Benefits (avoided Losses): The benefits are: (1) confining wildfire to the fuel block of origin, (2) separating residential developments from the undeveloped wildlands, (3) providing safe areas for firefighters, and (4) preserving the initial investment to construct the DFPZ.

Potential funding: Federal and state grants. It may be possible to combine federal grant monies as the landowners 25% cost share for participation in the California Forest Improvement Program.

Schedule: All DFPZ's will need to be maintained on a five to seven year cycle depending on location and fuel types.

ACTION #10: MAINTENANCE OF EXISTING FUEL MODIFICATION PROJECTS

Issue/Background: Amador Fire Safe Council's completed fuel management projects are currently due or will be due for maintenance within the next five years. To maintain their viability, these projects require periodic maintenance.

Project Name	Miles	Acres
Ram/Horn Fuel Modification Project	3	270
Shake Ridge Complex Prop 40	20.3	984
Sutter Highlands Fire Safe Project	NA	100
SPI Cooperative Fuelbreak	5	120
Pine Acres Fire Plan	NA	300
Pine Grove/Volcano Fuelbreak	1	45
Totals:		1819

Other Alternatives: None, without continuing maintenance fuels will re-grow and the effectiveness of the fuel management efforts will be diminished or eliminated.

Responsible Office: Amador Fire Safe Council

Priority (High, Medium, Low): High

Cost Estimate: Current fuelbreak maintenance cost are estimated at $500/acre or $909,500

Benefits (avoided Losses): The benefits are: (1) confining wildfire to the fuel block of origin, (2) separating residential developments from the undeveloped wildlands, (3) providing safe areas for firefighters, and (4) preserving the initial investment in the projects.

Potential funding: Federal and state grants. It may be possible to use federal grant monies as the landowners 25% cost share for participation in the California Forest Improvement Program.

Schedule: All fuel modification projects need to be maintained on a five to seven year cycle depending on location and fuel types.

ACTION #11: SENIOR ASSISTANCE

Issue/Background: Efforts to gain consistent and widespread compliance with defensible space requirements in Amador County have been less than successful for a variety of reasons. One group particularly difficult to bring into compliance is seniors who by a combination of low income and physical frailty can not clear their properties of flammable vegetation. Seniors without the means to accomplish the work may also be subject to cancellation of their homeowners insurance. Previously, the council provided contractors to seniors sixty five and older meeting the federal poverty level definition. The contractor hired by the council cleared flammable vegetation from the senior's property to the standard specified by law. The council proposes to expand the program to include a larger number (200) of qualifying seniors and to

include in the program eligibility standards spouses of military personnel on deployment overseas.

Other Alternatives: Inspection by the California Department of Forestry and Fire Protection (CDF). Due to the large number of homes and businesses requiring annual inspections only inspects a fraction of the structures susceptible to wildfire.

Responsible Office: Amador Fire Safe Council

Priority (High, Medium, Low): High

Cost Estimate: The cost estimate is $1,000 per home or $200,000 annually

Benefits (avoided Losses): Compliance with the clearance standards of California's Public Resources Code 4291 is the single most effective means of mitigating the damage to property from wildfire. The Amador County Generic Wildfire Protection Plan contains the goal of 90% voluntary compliance with the clearance requirements.

Potential funding: Federal and state grants.

Schedule: As funded is available

ACTION #12: SECONDARY DEFENSIBLE FUEL PROFILE ZONES (DFPZ)

Issue/Background: The Amador County Generic Community Wildfire Protection Plan identifies eighteen secondary DFPZ's that either interconnect with primary DFPZ's or are located in such a way as to rough function similar to the USFS SPLAT model.

Project Name	Miles	Acres	Project Name	Miles	Acres
Copper Hill Mine	1.4	17	Mule Creek	1.3	46
East Latrobe	2.5	89	Paine Road	2.2	27
Oak Meadow	1.9	23	Jackson Valley Road	2.2	27
Old Sacramento North	3.6	131	Chemisal	2.5	91
Enterprise	2	73	Mountain Spring	1.5	18
Bell Road	2.3	28	Previtali Road	3.2	118
Brush Road	1.3	16	Fiddletown Road	2.6	31
Irish Hill Road	3.2	115	Highway16E	1.3	15
Clay Pit	1.8	66	Canzatti Springs	2.9	104
Mule Creek	1.3	46	Totals	39.7	1035

Other Alternatives: None

Responsible Office: Amador Fire Safe Council

Priority (High, Medium, Low): High

Cost Estimate: Current fuelbreak construction cost run on average $1000/acre for a total of $1,035,000

Benefits (avoided Losses): When completed, these projects will slow the progress of a wildfire giving firefighters an opportunity to control the fire at a smaller size.

Potential funding: Federal and state grants. It may be possible to combine federal grant monies as the landowners 25% cost share for participation in the California Forest Improvement Program.

Schedule: The council can manage $700,000 to $1,000,000 in fuel modification projects annually. Assuming funding is available in 2007 the work can be accomplished by 2010

ACTION #13: MAINTENANCE OF SECONDARY DEFENSIBLE FUEL PROFILE ZONES

Issue/Background: These projects are identified in Amador County's Generic Community Wildfire Protection Plan and are designed to create secondary "Defensible Fuel Profile Zones" and initial fuel modification. To maintain their viability, these projects require periodic maintenance.

Project Name	Miles	Acres	Project Name	Miles	Acres
Copper Hill Mine	1.4	17	Mule Creek	1.3	46
East Latrobe	2.5	89	Paine Road	2.2	27
Oak Meadow	1.9	23	Jackson Valley Road	2.2	27
Old Sacramento North	3.6	131	Chemisal	2.5	91
Enterprise	2	73	Mountain Spring	1.5	18
Bell Road	2.3	28	Previtali Road	3.2	118
Brush Road	1.3	16	Fiddletown Road	2.6	31
Irish Hill Road	3.2	115	Highway16E	1.3	15
Clay Pit	1.8	66	Canzatti Springs	2.9	104
Mule Creek	1.3	46	Totals	39.7	1035

Other Alternatives: None

Responsible Office: Amador Fire Safe Council

Priority (High, Medium, Low): High

Cost Estimate: Current fuelbreak maintenance cost are estimated at $500/acre for a total of $517,500

Benefits (avoided Losses): The benefits are: (1) confining wildfire to the fuel block of origin, (2) separating residential developments from the undeveloped wildlands, (3) providing safe areas for firefighters, and (4) preserving the initial investment to construct the secondary DFPZ.

Potential funding: Federal and state grants. It may be possible to combine federal grant monies as the landowners 25% cost share for participation in the California Forest Improvement Program.

Schedule: All DFPZ's will need to be maintained on a five to seven year cycle depending on location and fuel types.

AGRICULTURAL MITIGATION ACTIONS

ACTION # 14: DEVELOP A NOXIOUS WEED ORDINANCE

Issue/Background: Noxious weeds are highly invasive with a well-known propensity to establish and disseminate rapidly. Unpalatable to livestock, these weeds will out-compete native vegetation quickly, eventually creating a monoculture that negatively impacts wild areas, rangeland, national forests, hay crops and other assets of economic and natural importance. The objective is to eradicate noxious weeds in the project area, thereby eliminating or significantly reducing further spread in California.

The ordinance would include measures to restrict the types of plants/landscaping allowed in the County and restrict the types of plants that Nurseries are allowed to sell.

Responsible Office: Amador County Agricultural Commission

Priority (H, M, L): Medium

Cost Estimate: Existing budget and staff

Enforcement: Agricultural Commissioner Staff

Benefit: Unpalatable to livestock, these weeds will out-compete native vegetation quickly, eventually creating a monoculture that negatively impacts wild areas, rangeland, national forests, hay crops and other assets of economic and natural importance. A comprehensive eradication program will benefit counties and national forests in California.

Potential Funding: State and or Federal Grants

Schedule: Within two years

ACTION #15: CONTINUE AND MAINTAIN NOXIOUS WEED ERADICATION PROGRAM

Issue/Background: Occurrences of noxious weeds along highway shoulders and private lands within the project area were detected and treated in Amador County from 2001 thru 2003. The survey and eradication project targeted Spotted Knapweed, Oblong Spurge, Tree of Heaven and Yellow Starthistle. After three seasons of survey and eradication work, the populations along key roads have been significantly reduced, and eradication is still deemed possible. A comprehensive eradication project will require the continuation of a thorough program including delimitation, monitoring, treatments, and prevention components.

In general, eradication of noxious weeds in some areas is obtainable; however, it can often become a protracted effort. Therefore as stated in the California State Weed Plan, a rapid response is necessary to achieve the eradication objective.

Responsible Office: Amador County Agricultural Commission

Priority (H, M, L): High

Cost Estimate: $50,000/year

Benefit: Unpalatable to livestock, these weeds will out-compete native vegetation quickly, eventually creating a monoculture that negatively impacts wild areas, rangeland, national forests, hay crops and other assets of economic and natural importance. A comprehensive eradication program will benefit counties and national forests in California. In the bigger picture, long-term success in California will depend on it

.

Potential Funding: Grants

Schedule: As soon as funding can be found

ACTION #16: CONTINUE WEED CONTROL ALONG STATE HIGHWAYS

Issue/Background: Weed control along state highways has been done by the California Department of Transportation (Caltrans) District 10, which has the responsibility for highway weed control in Amador County (which does not have its own weed eradication program). This has increased the danger of wildfires being started by vehicles that have had to pull off the road and stop. It has also had an effect on safety of the public and department employees.

Other Alternatives: No other alternative

Responsible Office: District Ten Caltrans

Priority (High, Medium, Low): H

Cost Estimate: $50,000.00

Benefit: Less damage to the environmental areas, rangeland, national forest, and other public and private lands

Potential funding: Caltrans Budget

Schedule: Next Year

CITY OF AMADOR CITY RECOMMENDED MITIGATION ACTIONS

ACTION #1: HIGHWAY 49 BRIDGE RENOVATION.

Issue/Background: During extreme rain conditions and high water events, the waters of Amador Creek completely fill the carrying capacity of this bridge. In some instances the waters have then backed up and flooded adjacent streets and buildings. Also at risk is the domestic water main that serves the part of the City laying to the south of Amador Creek. This water main is especially susceptible to damage from floating debris carried by high water.

Other Alternatives: No action. Relocating the water main.

Responsible Office: City of Amador City

Priority (High, Medium, Low): High

Cost Estimate: $1,400,000.

Benefits (avoided Losses): This project will maintain the integrity of the main water supply line to the south side of the City and prevent street and building flooding in the vicinity of Water St. and Hwy 49.

Potential funding: State of California Highway 49 bypass relinquishment monies.

Schedule: Contract to be awarded by Nov. 2008.

ACTION #2: MID-TOWN SEWER CROSSING PROTECTION

Issue/Background: During extreme rain conditions and high water events, the waters of Amador Creek reach the level of the mid-town sewer line. If high water washes away this line the City would be liable for hefty fines due to raw sewage escaping into Amador Creek.

Other Alternatives: No action.

Responsible Office: City of Amador City

Priority (High, Medium, Low): High

Cost Estimate: $5,000 per year, however creek cleaning has been done in the past as a community service activity of the CYA camp.

Benefits (avoided Losses): This project will give protection to the creek and local environment from spill of raw sewage, avoidance of fines.

Potential funding: City Of Amador City

Schedule: On-going, seasonal.

CITY OF IONE RECOMMENDED MITIGATION ACTIONS

ACTION # 1: SUTTER CREEK BANK STABILIZATION AND MAINTENANCE

Issue/Background: Sutter Creek has many vertical banks within the City limits that are eroding and at risk of ultimately collapsing. The City has recently had to rebuild one area of the bank to save a back yard from destruction. We do not have the staff to properly clear the debris and growth from the creek bottom during the summer. Nor do we have the manpower or funding to stabilize the problem banks. The overgrowth causes the creek to alter its course, which adds to the bank erosion problem and also causes damming of the creek, which leads to potential flooding.

Other Alternatives: No Action

Responsible Office: City of Ione, Department of Public Works

Priority (H, M, L): Medium

Cost Estimate:

Benefit: Protect property from erosion and flooding

Potential Funding: The maintenance of the creek was previously provided by CDC crews from Mule Creek State Prison, however, budget cuts no longer allows them to assist. Let's ask the State to allow the crews to be a productive part of the community and help prevent disasters.

The bank stabilization could be funded by FEMA.

Schedule: As soon as funding is obtained.

CITY OF JACKSON RECOMMENDED MITIGATION ACTIONS

ACTION # 1: MARCUCCI LANE BOX CULVERT

Issue/Background: The south fork of Jackson Creek must pass through several over crossings as it flows parallel to Highway 49 in Jackson. One of the overpasses is an arch culvert that is not large enough to allow high flows of water to pass though during heavy rain events. As a result, the homes along South Avenue (parallel and east of Highway 49 on the other side of the creek) are subject to flooding. (See photos on following page.) The City Engineer has recommended replacement of the existing arch culvert with a triple box culvert designed to significantly increase the hydrological capacity of this location, thus reducing the flood potential behind the culvert.

Other Alternatives: Remove existing culvert and close road or install a bridge at a higher cost rather than the triple box culvert.

Responsible Office: City of Jackson

Priority (H, M, L): High

Cost Estimate: **$**403,200 (includes preliminary engineering, environmental, R/W acquisition, construction engineering and construction costs.

Benefit: Reducing flood potential of homes along South Avenue.

Potential Funding: To be determined.

Schedule: Design, environmental and permitting activities would likely take up to a year based on previous project experience. Construction time is estimated at 60 days.

(Photos: Marducci Lane – Existing Arch Culvert and Flooding Problems, 2006)

ACTION # 2: VEGETATION ABATEMENT FOR FLOOD CONTROL

Issue/Background: Three forks of Jackson Creek converge in the downtown area and encompass a large area of the city. The creeks are in their natural state and as such, contain significant native and non-native vegetation that must be controlled on an annual basis. If the grasses are not cut back and removed on an annual basis, the creeks would "clog" and the hydrology of the creeks would be restricted and back up water upstream creating a potential flood hazard.

Other Alternatives: Line the creeks with concrete or use a weed control chemical.

Responsible Office: City of Jackson

Priority (H, M, L): High

Cost Estimate: $5,000 per year

Benefit: Besides preventing flooding by improving the hydrological conditions in the creek, the removal of the vegetation also allows for greater evaporation of stagnant ponds in the creek which are breeding grounds for mosquitoes.

Potential Funding: To be determined.

Schedule: This activity occurs on an annual basis beginning in September.

CITY OF PLYMOUTH RECOMMENDED MITIGATION ACTIONS

ACTION #1: REPLACE TEMPORARY BRIDGE AT WASTEWATER TREATMENT PLANT SPRAY FIELD.

Issue/Background: In the early 1990's, during an extreme winter storm and flooding in the Little Indian Creek tributary to the Consumnes River, the high waters wiped out the existing bridge to the treatment plant spray field complex. The bridge is used as the primary access to the facility and delivery of chlorine to the plant. The temporary bridge needs to be replaced.

Other alternatives: No action.

Responsible Office: Director of Public Works and City Engineer

Priority (High, Medium, Low) High

Cost Estimate: $85,000

Benefits: Pipes that were installed as a temporary measure can be removed and the streambed restored to its natural state. Avoid blockage and further damage during a severe storm.

Potential funding: FEMA, grant funding or possible local funds.

Schedule: Determined on availability of funding.

ACTION #2: MAINTAIN AND ENHANCE WATER CANAL BY CONVERTING EARTHEN ARROYO DITCH TO A FIXED PIPELINE OR GUNITE-LINED CANAL.

Issue/Background: Wildfires present significant hazards to Amador County, CDF and most fire departments depend on the canal system as an initial source of water. The system is operated by the Amador Water Agency as a source of water for firefighting.

Other Alternatives: Build pipeline, build additional storage tanks or reservoirs or take no action.

Responsible Office: Amador Water Agency in cooperation with the city.

Priority (High, Medium, Low) Medium to High

Cost Estimate: $400,000 to $500,000 annually.

Benefit: Improves reliability of canal system for life safety, reduction in property loss and public water supply for City and others in the County.

Potential Funding: FEMA, Grant program, AWA and other sources.

Schedule: Immediate and ongoing.

ACTION #3: INDIAN CREEK STREAM RESTORATION AND CULVERT IMPROVEMENT IN FLOOD HAZARD ZONE

Issue/Background: History of flooding along Highway 49, near the Pokerville Market and 49er Village, extending into adjacent areas along the Little Indian Creek streambed.
Project improvements would include larger culverts and local storm drainage improvements for the streets. Cleaning and clearing of debris in Little Indian Creek and providing annual maintenance of the streambed.

Other Alternatives: No action.

Responsible Office: CalTrans, City Engineer and Public Works Director

Priority (High, Medium, Low) High

Cost Estimate: $200,000 to $300,000

Benefit: Project is necessary for health and safety issues relating to flood events. Environmental improvements created by maintenance to the streambed.

Potential Funding: FEMA, new State infrastructure funding and grant funding.

Schedule: 2006 work with CalTrans, ACTC, to complete some design work and approval for construction in 2007.

ACTION #4: PLYMOUTH STORM DRAIN SYSTEM

Issues/Background: The storm drain system under the city is comprised of a number of tunnels and channels directing run-off water to the local waterway. Several sections, if not most, of the system are original and dating back to as many as 100 years. Significant rainfall can cause temporary flooding and cause erosion to this older drainage system. The system itself needs to be evaluated for future repair/replacement, or other in an effort to eliminate potential flooding within the city which can result in the loss of buildings.

Other Alternatives: Do not evaluate.

Responsible Office: City Engineer and Public Works Director.

Priority (High, Medium, Low) High

Cost Estimate: $35,000 to $50,000. To conduct a full assessment and develop a plan that would identify required mitigation measures. It would be anticipated this assessment and plan development would provide mitigation/preparation in the event of a 100-year flood event.

Benefit: Reduction of flood related damage to buildings and property in Plymouth. It is estimated that this project can eliminate much of the damage from a storm system with significant rainfall.

Potential Funding: Funding is unavailable for such a project.

Schedule: It is undetermined at this time the cost benefit. It would be anticipated that the proposed system assessment would identify such benefit.

ACTION #5: DEVELOP A COMMUNITY WILDFIRE PREVENTION PLAN

Issue/Background: Vegetation management projects will result in ongoing fuels/vegetation reduction and management on public and private properties in the city; implementation and enforcement on private properties for both existing properties and new development; and development of criteria for on-going maintenance of the fuels management and defensible space program.

Planning will be consistent with the Amador Fire Protection District (AFPD), the California Department of Forestry and elements of various codes of the State of California.

Other alternatives: No action would result in less compliance with defensible space requirements.

Responsible Office: Amador Fire Protection District with cooperation of the city.

Priority (High, Medium, Low): High

Cost Estimate: Inspections cost approximately $11.50 for the inspector's time and insurance, mileage and a manager. An additional cost would be for literature to hand out. The most important handout is the Homeowner's Checklist in color at a cost for each document of approximately $2.50 to $3.00 each. The Checklist is also available from the CDF and available at www.fire.ca.gov/php/education_checklist.php

Benefit: Reduce property loss and most importantly life safety.

Potential funding: To be determined. One source that might develop is a successful campaign for an increase in the sales tax for fire protection services.

Schedule: Annually, as funding develops. Since every property needs to be inspected each year, inspections on a rotating basis would allow smaller annual amounts of funding needed.

CITY OF SUTTER CREEK RECOMMENDED MITIGATION ACTIONS

ACTION #1: CHINA GULCH DRAINAGE

Issue/Background: China Gulch Creek enters the City near the Sutter Creek Fire Hall next to Highway 49/Hanford St. China Gulch Creek travels across Highway 49 to China Gulch. It travels behind the Days Inn and meets the intersection of Badger St./Spanish St./North Amelia/Mahoney Mill Road. It goes into a culvert under this 5-way intersection and then into a ditch until it joins Sutter Creek next to the Badger St. Bridge. This culvert has proved to be too small in the past and has caused the China Gulch Creek to overflow. A hazard elimination grant has been filed but has been in the queue for several years. A development project in the area of the Sutter Creek fire hall may correct the problem by on-site retention but the project is not yet approved.

Other Alternatives:

1. Upsize the culvert to carry the flow.

2. Retain peak storm event volume upstream.

Responsible Office: City of Sutter Creek

Priority (High, Medium, Low): Medium

Cost Estimate: $214,500

Benefits (avoided Losses): This drainage project will avoid losses to properties along China Gulch and along Badger St./ Spanish St. The culvert overflows every few years.

Potential funding:

1. The City of Sutter Creek has filed a hazard elimination grant and is in the queue awaiting funding.

2. In addition, a proposed development is in the Planning Commission process. A condition of the project, if it is approved, is to correct this drainage through on-site retention or by replacing the culvert.

Schedule: None at this time.

ACTION #2: GOPHER CREEK FLOOD CONTROL

Issue/Background: Gopher creek enters the City limits on Gopher Flat Road and follows it as an open creek until it reaches Cole St. After this point, it travels in a culvert all the way under Main St., along Hayden alley, and finally across a residential lot until it reaches Sutter Creek.

Historically, the culvert between Cole St. and Main St. has been too small. Because of this constriction, the creek overflows the culvert and sheets water down Gopher Flat Road where it floods yards along the way and finally floods Main St. Once crossing Main St., the flow re-joins the Gopher Creek culvert via drop inlets.

The City completed a drainage project in 1998 that corrected much of the problem but a small section near Gopher Flat Road and Main St. could not be corrected due to a greenstone rock section. The City decided to reduce the flow upstream via a diversion at Manor Court or via a new drainage pipe along Broad St. Neither of these projects has yet been completed.

Other Alternatives: Divert flow upstream at either Manor Court or at Broad St.

Responsible Office: City of Sutter Creek

Priority (High, Medium, Low): Medium

Cost Estimate: $483,680.00

Benefits (avoided Losses): One major flood incident was recorded in 1997. Since the repairs made the next year, one minor incident of flooding occurred.

Potential funding: Development project, Powder House Estates: This project is approved and may begin construction next spring. The City anticipates requiring their participation in a drainage improvement project that will divert storm drain flows through a new pipe aligned in Broad St. This pipe will take about half of the flow to Sutter Creek near the Minnie Provis Park.

Schedule: None at this time.

AMADOR WATER AGENCY RECOMMENDED MITIGATION ACTIONS

ACTION #1: INCREASE AWA'S CAPACITY TO DISTRIBUTE WATER TO CURRENT FIRE FLOW STANDARDS

Issue/Background: The Central Amador Water Project (CAWP) distribution system is undersized to provide current fire flows. The original distribution systems installed in the 1960s and 1970s do not meet current fire flow design standards.

Other alternatives: None

Responsible Office: Amador Water Agency

Priority (High, Medium, Low): Medium

Cost Estimate: $10,000,000

Benefit: Protection of life and property in wildfire or house fire incidences

Potential funding: To be Determined

Schedule: To be determined.

ACTION #2: REPLACE CAWP PUMPING SYSTEM WITH GRAVITY SUPPLY LINE

Issue/Background: Currently, the pumping system requires a power source to operate. In heavy storms or wildfires, there is a medium probability that the power is interrupted to the pumping stations. Additionally, the pumping stations themselves are located in a steep canyon and could be damaged or destroyed in a wildfire.

Other alternatives: None

Responsible Office: Amador Water Agency

Priority (High, Medium, Low): High

Cost Estimate: $8,000,000

Benefit: Protection of life and property

Potential funding: USDA-RUS

Schedule: To be determined.

ACTION #3: IMPROVE/INCREASE THE STORAGE AND SPRAY FIELDS IN LAKE CAMANCHE UNIT 6 WASTEWATER SYSTEM

Issue/Background: The existing storage and spray irrigation system is not able to handle the increased rainfall received during the spring storms of 2006. Additional land is required so that a new storage pond and spray fields can be constructed to handle the disinfected secondary effluent.

Other Alternatives: None

Responsible Office: Amador Water Agency

Priority: High

Cost Estimate: $3,500,000

Benefit: Prevent environmental damage and violation of SWRCB waste discharge requirements. The system spilled over 1 million gallons the last two winters. Potential health risks avoided.

Potential funding: SWRCB-Small Community Wastewater Grant Program

Schedule: Fiscal Year 2006-07

ACTION #4: GAYLA MANOR LEACH FIELD REPLACEMENT PROJECT

Issue/Background: The wastewater spray fields became almost unusable for disposal during the spring storms of 2006. Storm water intrusion causes a build-up of stored wastewater which violated waste discharge requirements and could cause potential illegal releases.

Other Alternatives: None

Responsible Office: Amador Water Agency

Priority: High

Cost Estimate: $1,100,000

Benefit: Prevent environmental damage and violations of SWRCB waste discharge requirements. Potential health risks avoided.

Potential funding: SWRCB-Small Community Wastewater Grant Program

Schedule: Fiscal Year 2007-08

ACTION #5: PINE GROVE WASTEWATER ACCESS ROAD REHABILITATION PROJECT

Issue/Background: Access road to Pine Grove wastewater system has slipped during the spring storms of 2006. Year-round access is needed to monitor dosing tanks, leach fields, and ground water monitoring wells. Reestablish drainage ditch and install culverts where road was damaged from run-off.

Other Alternative: None

Responsible Office: Amador Water Agency

Priority: Medium

Cost Estimate: $100,000

Benefit: Allow for year-round access to maintain the system which benefits the customers using the system. Prevent violations of SWRCB waste discharge requirements.

Potential funding: To be determined
Schedule: Fiscal Year 2006-07

Action #6: Eagles Nest Leachfield-Stormwater Intrusion Project.

Issue/Background: Removal of surface rainfall that collects in low lying area adjacent to the leach field that over saturates the leach field, causing it to fail. The entire are needs to be graded and sloped around and below the existing leach field to redirect storm rainfall and run-off to existing culvert under paved airport strip.

Other Alternative: None

Responsible Office: Amador Water Agency

Priority: Medium

Cost Estimate: $20,000

Benefit: Prevent environmental damage and violations of SWRCB waste discharge requirements. Potential health risks avoided.

Potential funding: To be determined

Schedule: Fiscal Year 2007-08

ACTION #6: NEW YORK RANCH RESERVOIR SLUDGE/SILTATION REMOVAL PROJECT

Issue/Background: Sediment and silt fill the reservoir during heavy rainfall events and overflow the diversion dam. The reservoir should be dredged to remove the silt and sludge.

Other Alternative: None

Responsible Office: Amador Water Agency

Priority: Medium

Cost Estimate: $300,000

Benefit: Prevent environmental damage and preserve the area for other uses.

Potential funding: To be determined

Schedule: Fiscal Year 2007-08

JACKSON VALLEY IRRIGATION DISTRICT RECOMMENDED MITIGATION ACTIONS

ACTION #1: DAM/SPILLWAY FAILURE

Issue/Background: High water flows may cause undermining of spillway channel which could undermine abutment to dam.

Other alternatives: Redirect Spillway channel away from Dam abutment.

Responsible Office: Jackson Valley Irrigation District

Priority (High, Medium, Low): Low

Cost Estimate: $1,000,000+

Benefit: Like Safety; property damage. Dam spillway cost to rebuild could run in excess of $10,000,000.

Potential funding: To be determined.

Schedule: To be determined.

ACTION #2: JVID DROUGHT MITIGATION – ADDITIONAL STORAGE

Issue/Background: Droughts occur two years in 20 in California. Adding additional storage to Jackson Creek Dam would mitigate loss of crops and water income. It would also provide a more reliable water supply for fire hydrants within the District. Raising the spillway 3-4 feet would add 2,000 acre feet to Lake Amador.

Other alternatives: Build additional reservoir at $50,000,000 to $100,000,000.

Responsible Office: Jackson Valley Irrigation District

Priority (High, Medium, Low): Medium

Cost Estimate: $1,000,000

Benefit: Like Safety; property losses – especially crop losses and wildfire losses.

Potential funding: To be determined.

Schedule: To be determined.

ACTION #3: JVID FLOOD MITIGATION

Issue/Background: Extreme flooding can cause loss of roads, loss of homes, removal of residents, damage to sewer oxidation ponds, fish hatcheries, and power generating plant.

Other alternatives: None

Responsible Office: Jackson Valley Irrigation District

Priority (High, Medium, Low): Medium

Cost Estimate: $195,000
Upgrade roads with concrete and rip-rap: $100,000
Clean Creek Channels (JVID property): $20,000
Build Evacuation Road to Pardee Reservoir: $25,000
Improve Levies around Oxidation Ponds: $50,000

Benefit: Like Safety; property damage in excess of $1,000,000

Potential funding: To be determined.

Schedule: To be determined.

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Multi-Hazard Mitigation Plan
6.0 Plan Adoption

44 CFR requirement 201.6(c)(5): "{The local hazard mitigation plan shall include} documentation that the plan has been formally adopted 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 participating jurisdictions, raise awareness of the plan, and formalize the Plan's implementation. The adoption of this plan completes Step 9 of the Plan Development Process: Formal Plan Adoption. The governing board for each participating jurisdiction have adopted this Multi-Hazard Mitigation Plan by passing a resolution. A copy of the generic resolution and the executed copy is included in Appendix D.

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Multi-Hazard Mitigation Plan
7.0 Plan Implementation and Maintenance

44 CFR 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 critical to the overall success of Hazard Mitigation Planning. This is Step 10 of the 10 step Plan Development Process.

Implementation

Upon adoption, the plan faces the truest test of its worth: implementation. Implementation implies two concepts: action and priority. These are closely related. While this plan puts forth many worthwhile and high priority recommendations, the decision about which action to undertake first will be the first task facing the HMPC. Fortunately, there are two factors that help make that decision. First, there are high priority items and second, funding is always an issue. Thus, pursuing low or no-cost high-priority recommendations will have the greatest likelihood of success.

Another important implementation mechanism that is highly effective and low-cost, is to incorporate the Hazard Mitigation Plan recommendations and their underlying principles of this into other community plans and mechanisms, such as the General Plan, Fire Plans, and capital improvement budgeting. The County has and continues to implement policies and programs to reduce losses to life and property from natural hazards. This plan builds upon the momentum developed through previous and related planning efforts and mitigation programs, and recommends implementing projects, where possible, through these other program mechanisms. **Mitigation is most successful when it is incorporated within the day-to-day functions and priorities of government and development**. This integration is accomplished by constant, pervasive and energetic efforts to network, identify and highlight the multi-objective, win-win benefits to each program, the Amador community, and its stakeholders. This effort is achieved through the routine actions of monitoring agendas, attending meetings, and promoting a safe, sustainable community.

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 any required local match or participation requirement can be met. When funding does become available, the HMPC will be in a position to capitalize on the opportunity. Funding opportunities to be monitored include special pre- and post-disaster funds, special district budgeted funds, state or federal earmarked funds, and grant programs including those that can serve or support multi-objective applications.

Additional mitigation strategies could include consistent and ongoing enforcement of existing policies, and vigilant review of County wide programs for coordination and identification of multi-objective opportunities.

Mitigation Coordinating Committee (HMPC)

With adoption of this plan, the HMPC will be tasked with plan implementation and maintenance. This Mitigation Coordinating Committee (i.e., HMPC), led by the County OES, agrees to:

- 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;
- 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;
- Maintain a vigilant monitoring of multi-objective cost-share opportunities to assist the community in implementing the plan's recommended actions for which no current funding exists;
- Monitor and assist in implementation and update this plan;
- Report on plan progress and recommended changes to the governing boards for the communities; and
- Inform and solicit input from the public.

The Committee will not have any powers over county staff; it will be purely an advisory body. Its primary duty is to see the plan successfully carried out and to report to the community governing boards and the public on the status of plan implementation and mitigation opportunities for the County. Other duties include reviewing and promoting mitigation proposals, hearing stakeholder concerns about hazard mitigation, passing concerns on to appropriate entities, and posting relevant information on the County website.

Maintenance

Plan maintenance implies an ongoing effort to monitor and evaluate the Plan implementation, and to update the plan as progress, roadblocks or changing circumstances are recognized.

Maintenance Schedule

In order to track progress and update the Mitigation Strategies identified in the Action Plan the County will revisit the Multi Hazard Mitigation Plan annually, or after a hazard event. The County OES is responsible for initiating this review and will consult with members of the HMPC. This monitoring and updating will take place through a semi-annual review by County OES, an annual review through the HMPC, and a 5-year written update to be submitted to the state and FEMA Region IX, unless disaster or other circumstances (e.g., changing regulations) lead to a different time frame.

Maintenance Evaluation Process

Evaluation of progress can be achieved by monitoring changes in vulnerabilities identified in the Plan. Changes in vulnerability can be identified by noting:

- Lessened 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 project 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
- Incorporating new data or studies on hazards and risks
- Incorporate new capabilities or changes in capabilities
- Incorporate growth and development-related changes to County inventories
- Incorporate new project recommendations or changes in project prioritization

In order to best evaluate any changes in vulnerability as a result of plan implementation, the HMPC will follow the following process:

- A representative from the responsible office identified in each mitigation measure will be responsible for tracking and reporting on an annual basis to the HMPC on the status of a given project and provide input on whether the project as implemented meets the defined objectives and is likely to be successful in reducing vulnerabilities; and
- If the project does not meet identified objectives, the HMPC will determine what additional measures may be implemented and an assigned individual will be responsible for defining project scope, implementing project, monitoring success of project, and making any required modifications to the plan.

Changes should be made to the plan to accommodate projects that have failed or are not considered feasible after a review for their consistency with established criteria, the time frame, County priorities, and funding resources. Priorities that were not ranked high, but identified as potential mitigation strategies, should 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 governing board of each participating jurisdiction. In keeping with the process of adopting the plan, a public involvement process to receive public comment on plan maintenance and updating should be held during the annual review period, and the final product adopted by the governing boards, appropriately.

Incorporation into Existing Planning Mechanisms

The Mitigation Strategy listed in Section 5.3 of this plan recommends utilizing existing plans and/or programs to implement hazard mitigation in the County, where possible. This point is also emphasized previously in this Implementation and Maintenance section. Based on this plan's capability assessment, the County has and continues to implement policies and programs to reduce losses to life and property from natural hazards. This plan builds upon the momentum developed through previous and related planning efforts and mitigation programs, and recommends implementing projects, where possible, through the following mechanisms:

- Utilization of the Amador County General Plan and County Code of Building Regulations
- Local Fire Safe Plans
- County Capital Facilities Plan
- Other Capital Improvement and General plans within the jurisdictions
- Other plans, regulations, and practices outlined within the Capability Assessment section of this plan

It should further be noted that the General Plan for the County is currently being updated. Similar to this Plan, the purpose and goal of the Safety Element of the General Plan is to reduce the potential risk of death, injuries, property damage, and economic and social dislocation resulting from natural hazards and other locally relevant safety issues. Amador County is committed to incorporating the goals, objectives, and mitigation strategy from this plan into the Safety Element through the General Plan Update process.

Continued Public Involvement

Continued public involvement is also imperative to the overall success of the plan and implementation of the mitigation strategy. The update process provides an opportunity to publicize success stories from the plan's implementation, and seek additional public comment. A public hearing(s) to receive public comment on plan maintenance and updating should be held during the update period. When the HMPC reconvenes for the update they will coordinate with all stakeholders participating in the planning process – or that have joined the Committee since inception of the planning process – to update and revise the plan. Public notice will be posted and public participation will be invited, at a minimum, through available web postings and press releases to the local media outlets, primarily newspapers and AM radio stations.

Multi-Hazard Mitigation Plan
Appendix A

Acronyms and Abbreviations Used in this Plan

AWA	Amador Water Agency
AWS	Amador Water System
BLM	Bureau of Land Management
BMPs	Best Management Practices
BOR	Bureau of Reclamation
CA-DWR	California Department of Water Resources
Caltrans	California Department of Transportation
CA-OES	California Office of Emergency Services
CAWP	Central Amador Water Project
CCR	California Code of Regulations
CDBG	Community Development Block Grants
CDF	California Department of Forestry
CEQA	California Environmental Quality Act
CERES	California Environmental Resources Evaluation System
CERT	Citizen Emergency Response Team
CFS	Cubic Foot per Second
CGS	California Geological Survey
CRCV	Coast Range Central Valley
CRS	Community Rating System
CWA	Clean Water Act

DMA	Disaster Mitigation Act
EIR	Environmental Impact Report
FEMA	Federal Emergency Management Agency (technically the Emergency Preparedness and Response (EP&R) within the Department of Homeland Security [DHS])
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
FMA	Flood Mitigation Assistance
FTP	File Transfer Protocol
FWS	Fish and Wildlife Service
GIS	Geographical Information System
HI	Heat Index
HMGP	Hazard Mitigation Grant Program
HMPC	Hazard Mitigation Planning Committee
HUD	Housing and Urban Development
JVID	Jackson Valley Irrigation District
Km	Kilometer
LHMP	Local Hazard Mitigation Plan
LOMA	Letter of Map Amendment
LOMC	Letter of Map Change
LOMR	Letter of Map Revision
MCE	Maximum Credible Earthquake
MMI	Modified Mercalli Intensity scale
MPE	Maximum Probable Earthquake

NCDC	National Climatic Data Center
NEPA	National Environmental Quality Act
NFIP	National Flood Insurance Program
NOAA	National Oceanic and Atmospheric Administration
NWS	National Weather Service
OES	Office of Emergency Services
PDM	Pre-Disaster Mitigation (Grant Program)
PG&E	Pacific Gas & Electric
PHGA	Peak Horizontal Ground Acceleration
POR	Period of Record
RL	Repetitive Loss
SEMS	State Emergency Management System
SUP	Special Use Permit
UBC	Uniform Building Code
URM	Unreinforced Masonry (e.g., brick buildings, most prone to earthquake damage)
USACE	United Sates Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WUI	Wildland Urban Interface
WNV	West Nile Virus

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Multi-Hazard Mitigation Plan
Appendix B

Data Collection Guide

MULTI-HAZARD MITIGATION PLAN
DATA COLLECTION GUIDE

For

AMADOR COUNTY
HAZARD MITIGATION PLANNING COMMITTEE (HMPC)

Prepared by

AMEC Earth and Environmental, Inc.

April, 2005

OVERVIEW

The contents of this workbook have been designed to assist Amador County, including participating jurisdictions, (collectively referred to as Amador) in collecting necessary background information to support the hazard mitigation planning process pursuant to the Federal Disaster Mitigation Act (DMA) of 2000. This includes a hazard identification and vulnerability assessment, an assessment of Amador's current hazard mitigation capabilities, and an identification of potential mitigation projects that, if undertaken, could prevent or reduce future losses.

The essential information needed to support the planning process includes background information about Amador; plans, technical studies, and data related to hazards and risks; current governing codes, ordinances, regulations, and procedures whose intent is to minimize future losses; and some indication of Amador's technical and organizational capabilities to perform hazard mitigation/loss prevention functions. It is important that the plan shows what Amador is doing now to limit future disaster losses.

The planning process is heavily dependent on existing data to be supplied by each of the participants represented on the Hazard Mitigation Planning Committee (HMPC). The DMA plan development process does not require the development of new data, but requires *existing data only*.

The information collected provides the basis for the action plan that contains goals for the future; identifies mitigation issues and actions that are important to each participant; and assigns priorities and responsibilities for their adoption and implementation. The goal of this process is to produce a hazard mitigation plan that meets Amador's needs, as well as the requirements of DMA 2000 and that contains a list of projects that may be eligible for streamlined federal mitigation funding pre or post disaster.

PARTICIPATION

The DMA planning regulations and guidance stress that each entity seeking the required FEMA approval of their mitigation plan must:

- Participate in the process;
- Detail areas within the planning area where the risk differs from that facing the entire area;
- Identify specific projects to be eligible for funding; and
- Have the governing board formally adopt the plan.

For HMPC members, 'participation' means the planning committee representatives will:

- Attend and participate in HMPC meetings;
- Provide available data that is requested of the HMPC coordinator;
- Review and provide/coordinate comments on the draft plans;
- Advertise, coordinate and participate in the public input process; and
- Coordinate the formal adoption of the plan by the governing board.

DATA COLLECTION GUIDE

This guide contains an explanation of the types of hazard mitigation/loss prevention data that is needed for the hazard mitigation planning process. This guide identifies specific requirements for the Risk Assessment Process, which includes the Hazard Identification, Vulnerability, and Capability Assessments and requirements for development of the Mitigation Strategy

AMEC has learned some valuable lessons about how to make the data collection process well organized and effective. Some ways of organizing the data collection process include: (1) the "circuit riding" HMPC member who contacts everyone individually in his/her jurisdiction or area of expertise and assembles the information; (2) the committee approach wherein a "mini-HMPC" is formed within the jurisdiction to collectively compile the needed data; and (3) a "network" based on existing relationships is used to funnel data to the HMPC representative (seems especially useful for widely dispersed types of organizations that have common functions, such as school districts and fire districts). Regardless, it is important to contact and involve those persons whose responsibilities include activities for avoiding future losses.

Some lessons about effective data collection include: (1) being inclusive; that is, collecting all of the potentially useful information one time so time-consuming follow-up work is minimized, (2) following this guidance carefully, and (3) asking questions of the consultants before great effort is expended.

The worksheets at the end of this guide have been developed to assist with the data collection. These need to be completed by each participating entity and will serve two purposes:

1) they will help facilitate the collection of the necessary information, and
2) they will function as evidence of "participation" in the planning process.

The Risk Assessment Process

The risk assessment process includes three components: 1) Hazard Identification, 2) Vulnerability Assessment, and 3) Capability Assessment. Data needs for each of the plan components are described in the following pages.

Hazard Identification Data for the following hazards:

- Avalanche
- Dam failure
- Drought
- Earthquakes
- Floods
- Landslides
- Natural health hazards

    - West Nile Virus
    - Rabies
    - Other?
- Severe weather
    - Dust storms
    - Extreme temperatures
    - Fog
    - Hailstorm
    - Heavy rains/storms
    - Lightning
    - Tornadoes
    - Windstorm
    - Winter Storms
- Soil Hazards
    - Land subsidence
    - Expansive soils
    - Erosion
    - Soil liquefaction
- Volcanoes
- Wildfires

Specifically, we need the following types of data to construct a good historical summary of each hazard as it impacts Amador:

- What type of hazard event?
- Brief description of the nature and magnitude of the event
- Where did the event occur?
    - County, City, area/facilities affected, physical location/boundaries on map
- When did it occur – date?
- Type of damage?
    - Personal injury/death
    - Damage to infrastructure/personal property
    - Damage to crops
    - Lost business or work
    - Road/School/other closures
- Approximate dollar amount of damage?
- Percentage of costs covered by insurance? Other?
- Opinion as to whether this is likely to occur again, either in the planning area in general and/or in the location of the previous occurrence.
- Dollars received from federal/state disaster declarations in each community

A summary Hazard Identification Worksheet (**Worksheet 1**) and Historic Hazard Event Data Collection Sheet (**Worksheet 2**) are included at the end of this workbook to help collect this information. It is also very useful to provide backup data that supports the information provided in the worksheets. Types of backup data include news articles and reports, interagency memos, and copies of pertinent information from technical reports, plans and studies.

Vulnerability Data

For each identified hazard, we need to determine the vulnerability of Amador as follows:

- Do any of the hazards occur repeatedly in a given area or areas to create a hazard map? Provide existing hazard map or identify hazard risk areas on a base map.
- Inventorying each mapped risk area (hazard by hazard, where different):
    - Total Values at Risk (i.e., types, numbers, and value of improvements)
    - Building Counts, by type of use, occupancy, construction
    - Estimated Values of those structures
    - Past Loss Data, as an indication of potential future losses
    - Insurance Data – coverage, claims paid, and repetitive losses
    - Identification of critical facilities at risk and provide estimated values (See list below)
    - Identification of natural resources at risk- wetlands, threatened & endangered species, others
    - Identification of cultural resources at risk – state & federal listed historic sites
    - Identification of impact to the community
    - Describe development trends within risk area
- Identify the above items for risk areas that can't be specifically mapped (likely a total listing of all above items on a community by community basis)
- County Abstract of assessed valuations or insured values
- Flood risk areas and floodplain inventory on a community by community basis (# of buildings and # of Repetitive Losses)
- National Flood Insurance Program (NFIP) insurance data (# of policies, number/date/dollars of claims paid)
- Average depth of 100-year floodplain in communities

A critical facility is often defined as one that is essential in providing utility or direction either: 1) during the response to an emergency; or 2) during the recovery operation. Some critical facilities are likely located in identified risk areas of the County and communities, potentially rendering them inoperable in an emergency. Critical facilities can also include those facilities that may require additional attention during an emergency such as daycares and nursing homes. Examples of critical facilities include:

- Main County Office Building/Municipal Buildings
- Water pumping and disinfection stations
- Airports
- Wellheads and water towers and tanks
- Power Substations
- Sewage Lift Stations
- Aboveground pipeline (gas) facilities
- Police Stations
- Fire Stations
- Emergency Operations Center(s)
- Key Access Roads
- Hospitals
- Schools
- Shelters
- Day Cares
- Nursing Homes

A Vulnerability Worksheet (**Worksheet 3**) is included at the end of this workbook.

Capability Data

This section describes the type of required information for documenting Amador's existing capabilities for reducing future disaster losses. A matrix (**Worksheet 4**), included at the end of this workbook, can be used as a checklist for collecting this information.

Capabilities are methods that the participating jurisdiction currently uses to reduce hazard impacts. A capability matrix is provided to help identify the usual methods that communities follow to mitigate hazards. Please err on the side of generosity so the planning team has the most complete relevant information available to it to support the planning process. Please complete the matrix and *provide supporting documentation* regarding:

- ID and provide other programs/projects underway for hazard mitigation
- ID and provide other community plans and goals
- ID and provide existing policy/program guidance
  - General Plan/safety elements/natural environment elements
  - Zoning/Flood Plain Management Ordinances
  - Building Codes (Seismic, Wildfire, BCEGS rating?)
  - Existing Emergency Management (i.e., Warning, Evacuation, EOC, LEPC, Utilities Response Plan)
- Other existing capabilities that mitigate the risk and vulnerability of a community to a given hazard?
- Listing of GIS Data available for each community: Floodplain maps, Floodplain Building/parcel inventory, Building type? Critical facility inventory [Police, Fire, Power, Water, Sewer, Drainage pumps], repetitive loss *areas*, completed/underway mitigation project areas (elevation/acquisition), land use, building types (URM, manufactured housing parks), soils map, vegetation types, natural/cultural resource areas, dam-failure inundation maps, levee failure inundation maps, existing hazard maps)
- Response and evacuation plans for Dams

The Mitigation Strategy

One of the planning process' last activities will be for HMPC members to prepare brief descriptions of proposed mitigation projects that would effectively reduce future disaster losses. It is very important that potential projects start being identified very early so the information needed to describe them and to assign priorities is developed during the entire process, leaving only "final tinkering" for the final phase of work.

This section provides guidance on the categories of mitigation measures to be considered and a mitigation project outline with two example projects. Two Mitigation Worksheets (**Worksheets 5 and 6**) are included at the end of this workbook. **Worksheet 5** provides a form for brainstorming potential projects to address identified issues. **Worksheet 6**

provides the format for writing up potential projects to be included in the mitigation strategy.

Categories of Mitigation Measures

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

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

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

- ***Warning*** (flooding, tornadoes, winter storms, geologic hazards, fire)
  - NOAA Weather Radio
  - Sirens
  - "Reverse 911" (Emergency Notification System)
- ***Emergency Response***
  - ***Evacuation & Sheltering***
  - ***Communications***
  - ***Emergency Planning***
    - Activating the EOC (emergency management)
    - Closing streets or bridges (police or public works)
    - Shutting off power to threatened areas (utility company)
    - Holding/releasing children at school (school district)
    - Passing out sand and sandbags (public works)
    - Ordering an evacuation (mayor)
    - Opening emergency shelters (Red Cross)
    - Monitoring water levels (engineering)
    - Security and other protection measures (police)
- ***Critical Facilities Protection (Buildings or locations vital to the response and recovery effort, such as police/fire stations, hospitals, sewage treatment plants/lift stations, power substations)***
  - Buildings or locations that, if damaged, would create secondary disasters, such as hazardous materials facilities and nursing homes
  - Lifeline Utilities Protection
- ***Post-Disaster Mitigation***

- Building Inspections
- ID mitigation opportunities & funding before reconstruction

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

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

- Introduce natural predators

- ***Insurance***

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

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

Methods of protecting natural resources include:

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

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

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

- ***Dumping Regulations***
- ***Set-back regulations/buffers***
- ***Fuels Management***

- o ***Water Use Restrictions***
- o ***Landscape Management***
- o ***Weather Modification***

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

- They are expensive, sometimes requiring capital bond issues and/or cost sharing with Federal agencies, such as the U.S. Army Corps of Engineers or the Natural Resources Conservation Service.

- They disturb the land and disrupt natural water flows, often destroying habitats or requiring Environmental Assessments.

- They are built to a certain flood protection level that can be exceeded by a larger flood, causing extensive damage.

- They can create a false sense of security when people protected by a structure believe that no flood can ever reach them.

- They require regular maintenance to ensure that they continue to provide their design protection level.

Structural measures include:

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

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

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

Example Project Description

Each project description for each jurisdiction should conform to the following format:

TITLE
Issue/Background
Other Alternatives
Responsible Office
Priority (H,M,L)

Cost Estimate

Benefits
Potential funding
Schedule

This Mitigation Project Description Worksheet (**Worksheet 6**) is included at the end of this workbook to record potential projects during the planning process.

The following are two examples taken from other DMA 2000 qualifying plans.

Sample ACTION #12: ELEVATE REMAINING 95 HOMES IN THE DRY CREEK WATERSHED

Issue/Background: Historically, flooding in the Dry Creek watershed has been a major concern. The February 1986 flood caused widespread damage in most of the Dry Creek watershed. Nearly all bridges and culverts were overtopped, with 30 sustaining embankment damages and one crossing washing out; two bridges over Dry Creek were damaged, street cave-ins occurred at a number of locations, and over 125 homes flooded. Of the 145 homes subject to historical flooding within the Watershed, 95 structures remain non-elevated. Of these 95 remaining homes, 25-30 declined initial grant money for elevation as did the three repetitive loss structures. Placer County is not only concerned with existing flooding problems, but with future problems resulting from increased growth and development in the area. According to the 1992 Dry Creek Watershed, Flood Control Plan, substantial flood damages will occur with the 100-year flood under existing conditions. Areas with the most extensive and frequent damages include areas in the location of the 95 homes. The report indicates that some of these areas are susceptible to flooding from storms as frequent as the 10-year storm. Elevating the remaining 95 homes will reduce future flood-related losses.

Other Alternatives: No Action

Responsible Office: Placer County Flood Control and Water Conservation District, in conjunction with its member agencies including the cities of Rocklin, Loomis, and Roseville.

Priority (H, M, L): Medium

Cost Estimate: The cost to elevate is estimated at $40 per square foot. Homes need to be elevated anywhere from one to six feet. Of the 95 homes where elevating is feasible, it is estimated to cost $6 million or $50 to $60 K per home.

Benefit: Life Safety; Reduction in Property Loss.

Potential Funding: HGMP, PDM, Dry Creek Trust Fund

Schedule: Within three years

Sample ACTION #4: TODD VALLEY SHADED FUEL BREAK

Issue/Background: Saving lives and property along with rapid containment of wildfires and structure fires are a high priority for the Foresthill Fire Protection District (FFPD) and Foresthill Fire Safe Council (FFSC). The Todd Valley Subdivision is a neighborhood of about 1,100 homes located southeast of Foresthill, CA in rural Placer County. Encompassing some 1,500 acres, and 45 miles of roadways, with only two main exits to Foresthill Rd. The southern boundary of the 25-year-old subdivision directly intersects the steep cliffs of the Middle Fork of the American River. Lot sizes are all one acre or more. To the 3,000 people who live there, Todd Valley appears to be an isolated enclave, sheltered by towering oaks and pine trees. Many homes are shielded from neighbor's views by a quarter-century accumulation of dense brush and impenetrable vegetation under story. The calculations for fire travel from the Middle Fork American River to this subdivision in the middle of summer on the right day is 15 minutes.

A Shaded Fuel Break at the top of the ridge of the Middle Fork American River Canyon would give firefighters a place to make a stand and allow an area for the fire to slow and drop to the ground where it can be managed. This would also give Sheriffs and Firefighters a better chance to evacuate the area.

Other Alternatives: If you look at the fire history on the Foresthill Divide its not a question of IF but WHEN will we have a devastating wildfire. To do nothing in the Todd Valley area would leave the residents open to a devastating firestorm. The Placer County Chipper Program has been used very successfully in this area, but is still far from making a significant continuous connected Shaded Fuel Break. Continuous public education is also an alternative.

Responsible Office: Luana R. Dowling: FFSC Chairman

Priority (H, M, L): High

Cost Estimate: Approximately $1,200 per acre. 50/50 match with property owners and a Federal Grant. The Property in the canyon is State Recreation area owned by Bureau of Reclamation (BOR). This recreation area has been the area of several fire starts in the past. It's only a matter of time.

Benefit: Benefit to the 3,000 residents of Todd Valley is their lives as well as their homes. At the current County median value per home of over $400,000 per home, the 1,100 homes in Todd Valley are valued at $440,000,000. Having a strategically planned shaded fuel break will not only save lives, but also assist firefighters in gaining timely access to protect homes.

Potential Funding: Grants, loans and subsidies available for such projects.

Schedule: Completed by the end of 2008

WORKSHEETS

Worksheet 1
Hazard Identification Worksheet

Purpose: Use this worksheet to identify the possible hazards that may impact your jurisdiction. This worksheet will be used to support the hazard identification and risk assessment. Use the Hazard Event worksheet to provide evidence to justify your conclusions.

Hazard	Frequency of Occurrence	Spatial Extent	Potential Magnitude	Significance	Risk Map Avail. Source/scale	
					GIS	Hard Copy
Avalanches						
Dam Failure						
Drought						
Earthquakes						
Floods						
Hail						
Heavy Rains/Lightning						
High Winds						
Landslides						
Natural Health Hazards						
Tornados						
Wildfires						
Winter Storms						

Guidelines

Frequency of Occurrence:
Highly Likely: Near 100% probability in next year.
***Likely*:** Between 10 and 100% probability in next year, or at least one chance in ten years.
***Occasional*:** Between 1 and 10% probability in next year, or at least one chance in next 100 years.
***Unlikely*:** Less than 1% probability in next 100 years.

Potential Magnitude
***Catastrophic*:** More than 50% of area affected
***Critical*:** 25 to 50%
Limited: 10 to 25%
***Negligible*:** Less than 10

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

Significance (Your subjective opinion)

Low Medium High

Contact information
Filled out by:
Address:
Phone:

Worksheet 2
Historic Hazard Event Data Collection Sheet

Instructions: Please fill out one sheet for each event with as much detail as possible. Attach supporting documentation, photocopies of newspaper articles or other original sources.

Type of natural hazard event	
Date of Event	
Description of the nature and magnitude of the event	
Location (community or description with map)	
Injuries	
Deaths	
Property damage	
Infrastructure damage	
Crop damage	
Business/Economic Impact	
Road/School/Other Closures	
Other damage	
Total damages	
Insured losses	
Fed/State Disaster relief funding $	
Opinion on likelihood of occurring again	
Source of information	
Comments	

Contact information
Name of jurisdiction:
Filled out by:
Address:
Phone:

Worksheet 3
Vulnerability Assessment

Instructions: Please complete to the extent possible the vulnerable buildings, populations, critical facilities and infrastructure for each hazard that affects your jurisdiction. This information will be used to estimate disaster losses, which can then be used to gauge potential benefits of mitigation measures. Attach supporting documentation, photocopies of engineering reports or other sources.

Jurisdiction:

Hazard type, location and description of potential impact:

Building Inventory

Residential	count	Estimated value
Comments		
Commercial	count	Estimated value
Comments		

Industrial	count	Estimated value
Comments		
Agricultural	count	Estimated value
Comments		

Other (Define, e.g., gov.)	count	Estimated value
Comments		

Critical facilities (List, describe type, number, estimated value/replacement cost):

Infrastructure (roads, bridges, lifelines, utilities, etc. estimated value/ replacement cost):

Affected Population estimate:

Comments (i.e. special needs populations, residents serviced, etc.):

Historic/cultural resources affected:

Natural resources affected:

Other Community Impacts:

Development trends/constraints in hazard area:

Existing or potential mitigation actions:

Source and method of information collection:

Contact information
Filled out by:
Address:
Phone:

Worksheet 4: Capability Matrix

Jurisdiction:	Y/N other	Comments
Comp Plan/General Plan		
Subdivision Ordinance		
Zoning Ordinance		
NFIP/FPM Ordinance		
- Substantial Damage language?		
- Administrator/Certified Floodplain Manager?		
- # of Flood threatened Buildings?		
- # of flood insurance policies		
- # of Repetitive Losses?		
- Maintain Elevation Certificates?		
CRS Rating, if applicable		
Stormwater Program?		
Erosion or Sediment controls		
# of unreinforced masonry buildings		
Hospitals built before 1973 (for HSSA)		
Alquist-Priolo Special Studies Zones Act		
Building Code Version		
Full-time Building Official?		
Conduct "as-built" Inspections?		
BCEGS Rating		
Local Emergency Operations Plan		
Fire Department ISO Rating		
Fire Safe Programs		
Warning Systems/Services		
- Storm Ready Certified?		
- Weather Radio reception?		
- Outdoor Warning Sirens?		
- Emergency Notification (R-911)?		
- Other? (e.g., cable over-ride)		
GIS System?		
- Hazard Data?		
- Building footprints?		
- Links to Assessor data?		
- Land-Use designations?		
Structural Protection Projects		
Property Protection Projects		
Critical Facilities Protected?		
Natural/Cultural Resources Inventory?		
Public Information Program/Outlet		
Environmental Education Program?		

EXPLANATION OF CAPABILITY ASSESSMENT MATRIX

The following definitions are designed to help each HMPC member complete an assessment of his or hers current capabilities. This list is not exhaustive, and the amount of information available locally can vary greatly between jurisdictions.

[Accompanying matrix entries: Y=yes, N=no, ? = uncertain or item unclear.]

Comprehensive, General, or Land Use Plan: Comprehensive (general, land use) long-term community growth management plan; in CA especially need copies of policy section, safety and public facilities elements, and any parts that mention public safety programs, hazards of any kind, and emergency services;

Special Plans: Also need similar information from any related "special plans" for limited areas (e.g., new developments, downtown renewals that might require special codes, wildland fire fuels management plans, etc.).

Subdivision Ordinance: Dictates lot sizes, densities, set-backs, construction type; need copy.

Zoning Ordinance: Dictates type of use and occupancy; implements Land Use Plan; need copy.

NFIP & FPM Ordinances: National Flood Insurance Program (NFIP) and Floodplain Management ordinances (FPM): govern development in identified Flood Hazard Areas, and are required for participation in NFIP and Floodplain Mitigation programs. Do not need floodplain maps, but do need related recent (within last 10 years) documents, special studies, program summaries, etc.

Substantial Damage Language: FPM ordinance language on Substantial Damage/Improvements ("50% rule"); copy needed if yes.

Administrator/Certified Floodplain Manager: Name and contact information needed for Floodplain Management Administrator (someone with the responsibility of enforcing the ordinance and providing ancillary services {e.g., map reading, public education on floods, etc.}, need to know if CFM).

# of flood threatened buildings: Need total number of buildings by community that are in the floodplains.

# of flood insurance policies: Need total number of buildings by community that are insured against floods through the NFIP.

# of Repetitive Flood Losses: Need number of repetitive losses properties (usually on a parcel basis); and for which NFIP/FEMA has paid more than $1,000 twice in the past 10 years.

Maintain Elevation Certificates: The Elevation Certificate documents the lowest floor elevation of any new building or substantial improvement built in the Special Flood Hazard Area. How does the jurisdiction maintain these?

Community Rating System (CRS) Rating: NFIP's: participation (yes or no), and if yes, need the rating.

Stormwater program: Need documentation of any existing stormwater management programs.

Erosion or Sediment Controls: Need summary information any projects or regulations.

# of unreinforced masonry buildings: Need number of URMs reported to state and any mitigation plan or risk reduction program information.

Hospitals built before 1973 - Hospital Seismic Safety Act: Need number of hospital buildings governed by HSSA that were built prior to 1973 and which are governed by 1994 legislation that calls for their replacement or change of use.

Alquist-Priolo Special Studies Zones Act: Need information about Act's local implementation regarding geologic studies, report reviews, development controls across defined active faults, etc.

Building Code Version: Need the date of most recent UBC adoption (do not need the code itself). Also need to know if the jurisdiction has a full-time inspector and if "as-built" inspections are conducted.

Building Code Effectiveness Grading System (BCEGS): rating information; need at least the rating and date of it; and could use back-up documentation showing ratings of various items, and need to know if not rated.

Local Emergency Operations Plan: Local Emergency Operations Plan (EOP; a disaster or multi-hazard functional response plan); and any directly related contingency plans (e.g., terrorism response, hazardous materials response, dam failure evacuation {and maps}. Do not need copies of full plans, but do need any hazard assessments/summaries from them and brief information about the compliance with CA's Standardized Emergency Management System (SEMS), recent or planned updates, training, exercises, etc.

Fire Department ISO Rating: Need at least the rating and date of it; and could use back-up documentation showing ratings of various items, especially fire prevention measures and programs, including date of most recent UFC adoption (do not need the code itself).

Fire Safe Programs: Need summary information about local fire-safe programs and extent of participation.

Hazard Mitigation Plans: Need existing Hazard Mitigation Plans that were for recent past disasters or that were prepared for other reasons. Also need related grant information: purpose of application (e.g., replace earthquake vulnerable communications center), amount requested, and whether approved or not.

Warning Systems/Services: Do not need technical information, but do need to know if communities have any types of systems, such as: "Storm Ready" Certification from the National Weather Service, NOAA's Weather Radio reception, sirens, cable (TV) override, "Reverse 911," etc.

GIS and HAZUS Capabilities: Geographic Information System capabilities and hazards layers and applications, including uses of federally-funded loss estimation software (HAZUS) for earthquakes, floods, and high winds. If yes, need summary information on hazards related layers (e.g., floodplains, ground motion contours) and how used (e.g., to estimate post-earthquake debris, zoning decisions).

Structural Protection Projects: Need summary information about proposed or planned projects (e.g., levees, drainage facilities, detention/retention basins, seismic retrofits).

Property Protection Projects: Need summary information about proposed or planned projects (e.g., buy-outs, elevation of structures, floodproofing, small "residential" levees or berms/floodwalls, non-structural measures for buildings).

Critical Facility Protection: Need summary information about proposed or planned projects (e.g., protection of power substations, sewage lift stations, water-supply sources, the EOC, police/fire stations, medical facilities) that are at risk from the area's hazards.

Natural And Cultural Inventories: Inventories of resources, maps, or special regulations within the community (e.g., wetlands, Native American sites, historic structures/districts, etc.); need only summary information.

Public Information And/Or Environmental Education Program: Do not need documents; need only summary information about ongoing programs even if their primary foci are not hazards (e.g., "regular" flyers included in utility billings, a website, or environmental education programs in conjunction with parks and recreational activities).

Worksheet 5
Mitigation Strategy

Date: Identify Mitigation Actions

Instructions: For each type of loss identified on previous worksheets, determine possible actions. Record information below.

Hazard _____

Priority	**Possible Actions** (include location)	**Sources of Information** (include sources you reference and documentation)	**Comments** (Note any initial issues you may want to discuss or research further)	**Planning Reference** (Determine into which pre-existing planning suggested projects can be integrated)

Contact information
Name of jurisdiction:
Filled out by:
Address:
Phone:

Worksheet 6
Mitigation Project Description Worksheet

Instructions: Use this guide to record potential mitigation projects (1 or more pages per project) identified during the planning process. Provide as much detail as possible and use additional pages as necessary. These will be collected following HMPC meetings on mitigation goals and measures and included in the plan.

Jurisdiction:

Mitigation Project Title:

Issue/Background:

Other Alternatives:

Responsible Office:

Priority (High, Medium, Low):

Cost Estimate:

Benefits (avoided Losses):

Potential funding:

Schedule:

Worksheet Completed by
Name and Title:
Phone:

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Multi-Hazard Mitigation Plan

Appendix C

Mitigation Categories, Alternatives and Selection Criteria

CATEGORIES OF MITIGATION MEASURES CONSIDERED
(from CRS, with some multi-hazard examples added)

- **Prevention**
  - Planning & Zoning
  - Open Space Preservation
  - Land Development Regulations
  - Storm Water Management
  - Fuels Management

- **Property Protection**
  - Fire-Wise Construction
  - Defensible Space/Fuels Modification
  - Water Supply
  - Flood Protection

- **Natural Resource Protection**
  - Erosion & Sediment Control
  - Wetlands Protection
  - Threatened & Endangered Species Protection
  - Fuels Management

- **Emergency Services**
  - Warning & Evacuation
  - Communications
  - Critical Facilities Protection
  - Lifeline Utilities Protection
  - Health & Safety Maintenance

- **Structural Projects**
  - Detention/Retention structures
  - Sediment Basins/Low-head Weirs
  - Channel Modifications
  - Culvert resizing/replacement/Maintenance
  - Floodwalls

- **Public Information**
  - Hazard Maps
  - Outreach Programs (mailings, media, web, speakers bureau)
  - Education Program (Children/Adults)

ALTERNATIVE MITIGATION MEASURES WITHIN EACH CATEGORY

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

- ***Planning***
- ***Zoning***
- ***Open Space Preservation***
- ***Land Development Regulations***
  - ***Subdivision regulations***
  - ***floodplain development regulations***
- ***Storm Water Management***
- ***Fuels Management, Fire-Breaks***
- ***Building Codes***
  - ***Fire-Wise Construction***
- ***(See Property Protection also)***

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

- ***Warning*** (floods, tornadoes, ice storms, hail storms, dam failures)
  - NOAA Weather Radio
  - Sirens
  - Reverse 911
- ***Evacuation & Sheltering***
- ***Communications***
- ***Emergency Planning***
  - Activating the emergency operations room (emergency management)
  - Closing streets or bridges (police or public works)
  - Shutting off power to threatened areas (utility company)
  - Holding children at school/releasing children from school (school district)
  - Passing out sand and sandbags (public works)
  - Ordering an evacuation (mayor)
  - Opening evacuation shelters (Red Cross)
  - Monitoring water levels (engineering)
  - Security and other protection measures (police)
- ***Monitoring of Conditions (dams)***
- ***Critical Facilities Protection (Buildings or locations vital to the response and recovery effort, such as police/fire stations, hospitals, sewage treatment plants/lift stations, power substations)***
  - Buildings or locations that, if damaged, would create secondary disasters, such as hazardous materials facilities and nursing homes
  - Lifeline Utilities Protection
  - Health & Safety Maintenance

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

- ***Retrofitting/disaster proofing***
  - ***Floods***
    - Wet/Dry floodproofing (barriers, shields, backflow valves)
    - Relocation
    - Acquisition
  - ***Tornadoes***
    - Safe Rooms
    - Securing roofs and foundations with fasteners and tie-downs
    - Strengthening garage doors and other large openings
  - ***Drought***
    - Improve water supply (transport/storage/conservation)
    - Remove moisture competitive plants (Tamarisk/Salt Cedar)
    - Water Restrictions/Water Saver Sprinklers/Appliances
    - Grazing on CRP lands (no overgrazing-see Noxious Weeds)
    - Create incentives to consolidate/connect water services
    - Recycled wastewater on golf courses
  - ***Earthquakes***
    - Removing masonry overhangs, bracing other parts.
    - Tying down appliances, water heaters, bookcases and fragile furniture so they won't fall over during a quake.
    - Installing flexible utility connections that won't break during shaking (pipelines too!)
  - ***Wildfire, Grassfires***
    - Replacing building components with fireproof materials
      - Roofing, screening
    - Create "Defensible Space"
    - Installing spark arrestors
    - Fuels Modification
  - ***Noxious Weeds/Insects***
    - Mowing
    - Spraying
    - Replacement planting
    - Stop overgrazing
    - Introduce natural predators

- ***Insurance***

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

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

Methods of protecting natural resources include:

- ***Erosion & Sediment Control***
- ***Wetlands Protection***
- ***Riparian Area/Habitat Protection***
- ***Threatened & Endangered Species Protection***
- ***Fuels Management***
- ***Set-back regulations/buffers***
- ***Best Management Practices***

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

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

- ***Dumping Regulations***
- ***Water Use Restrictions***
- ***Weather Modification***
- ***Landscape Management***

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

- They are expensive, sometimes requiring capital bond issues and/or cost sharing with Federal agencies, such as the U.S. Army Corps of Engineers or the Natural Resources Conservation Service.

- They disturb the land and disrupt natural water flows, often destroying habitats.

- They are built to a certain flood protection level that can be exceeded by a larger flood, causing extensive damage.

- They can create a false sense of security when people protected by a structure believe that no flood can ever reach them.

- They require regular maintenance to ensure that they continue to provide their design protection level.

Structural measures include:

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

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

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

MITIGATION ALTERNATIVE SELECTION CRITERIA

For use in selecting and prioritizing Proposed Mitigation Measures

1. STAPLE

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

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

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

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

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

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

Environmental: Does it comply with Environmental regulations?

2. SUSTAINABLE DISASTER RECOVERY

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

3. SMART GROWTH PRINCIPLES

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

4. OTHER

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

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Multi-Hazard Mitigation Plan
Appendix D

Community Adoption

Note to Reviewers: When this plan has been reviewed and approved pending adoption by FEMA Region IX, the adoption resolutions will be scanned and put on the document CD which will contain the adoptions, as Appendix D. A Model resolution is provided below:

Resolution # _____

Adopting the Amador County, California

Multi-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,** an adopted Multi-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 Multi-Hazard Mitigation Plan; and*

***Whereas,** the California Office of Emergency Services and Federal Emergency Management Agency, Region IX officials have reviewed the "*Amador County, California Multi-Hazard Mitigation Plan*" ( ) and approved it ( ) contingent upon this official adoption of the participating governing body;*

***Now, therefore, be it resolved,** that the **(Name of Government/District/Organization)** adopts the "*Amador County, California Multi-Hazard Mitigation Plan*" as an official plan; and*

***Be it further resolved, (Name of Government/District/Organization)** will submit this Adoption Resolution to the California Office of Emergency Services and Federal Emergency Management Agency, Region IX officials to enable the Plan's final approval.*

Passed: ___(date)___

_____

Certifying Official

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Multi-Hazard Mitigation Plan
Appendix E

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