



**BUTTE COUNTY  
MULTI-JURISDICTIONAL  
ALL HAZARD  
PRE-DISASTER  
MITIGATION PLAN  
MARCH 2007**



**Butte County  
Multi-Jurisdictional All Hazard  
Pre-Disaster Mitigation Plan**

March 2007

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Adoption by Local Governing Body: §201.6(c)(5)  
County of Butte

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Adoption by Local Governing Body: §201.6(c)(5)  
City of Biggs

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Adoption by Local Governing Body: §201.6(c)(5)  
City of Chico

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Adoption by Local Governing Body: §201.6(c)(5)  
City of Gridley

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Adoption by Local Governing Body: §201.6(c)(5)  
City of Oroville

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Adoption by Local Governing Body: §201.6(c)(5)  
Town of Paradise

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**1. Purpose / Vision / Values**

**Purpose of MHMP**

Butte County and the participating Butte County jurisdictions of the City of Biggs, the City of Chico, the City of Gridley, the City of Oroville and the Town of Paradise have developed this Multi-Jurisdictional All Hazard Pre-Disaster Mitigation Plan (MHMP) to create a safer community. This MHMP is the representation of the commitment of the County and participating jurisdictions to reduce risks from natural and other hazards, and serves as a guide for decision-makers as they commit resources to reducing the effects of natural and other hazards. This MHMP serves as a basis for the State Office of Emergency Services (OES) to provide technical assistance and to prioritize project funding. (See IFR §201.6).

While the Disaster Mitigation Act of 2000 (“DMA 2000”) requires that local communities address only natural hazards, the Federal Emergency Management Agency (FEMA) recommends that local comprehensive mitigation plans address man-made and technological hazards to the extent possible. Towards that goal, Butte County and the participating jurisdictions have addressed an expansive set of hazards.

Unless otherwise specified, reference throughout this Plan to the MHMP or Butte County includes Butte County and the cities of Biggs, Chico, Gridley, Oroville and the Town of Paradise.

The County of Butte is required to adopt a federally-approved Hazard Mitigation Plan to be eligible for certain disaster assistance and mitigation funding. The overall intent of this Plan is to reduce or prevent injury and damage from hazards in the County. It identifies past and present mitigation activities, current policies and programs, and mitigation strategies for the future. This Plan also guides hazard mitigation activities by establishing hazard mitigation goals and objectives.

The Plan is a “living document” that will be reviewed and updated annually to reflect changing conditions and improvements by new information, especially information on local planning activities. The Multi-Jurisdictional Hazard Mitigation Plan is written to meet the statutory requirements of DMA 2000 (P.L. 106-390), enacted October 30, 2000 and 44 CFR Part 201 – Mitigation Planning, Interim Final Rule, published February 26, 2002.

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**Goals Shared with State Multi-Hazard Mitigation Plan**

Butte County's MHMP supports the goals that it shares with the State of California Multi-Hazard Mitigation Plan, namely:

- Goal 1: Save Lives and Reduce Injuries
- Goal 2: Avoid Damages to Property
- Goal 3: Protect the Environment
- Goal 4: Promote Hazard Mitigation as an Integrated Policy

**Support of Broader County Vision**

The Multi-Jurisdictional Hazard Mitigation Plan supports the broader vision and values of Butte County as stated in the County's Mission, Vision and Values Statements:

**Mission**

Provide quality service with dignity, integrity and respect.

**Vision**

- To ensure basic health, safety, and protection of people.
- To facilitate commerce and trade in order to promote a high quality of life.
- To promptly resolve issues in an honest and consistent manner.
- To provide useful and effective service utilizing both public and private means.

**Values**

- *Fiscal Responsibility*  
We respect our obligation to the taxpayer and shall act in a fiscally responsible manner.
- *Pride In Service*  
We take pride in our mission, our organization, and the unique abilities of each individual employee to deliver quality service.
- *Integrity/Ethics*  
We shall conduct our business through honest and direct communication with integrity, trust, and a high standard of ethics and respect.
- *Decisive Leadership and Accountability*  
We value initiative and leadership, and are accountable for our performance.
- *Innovation*  
We encourage innovative programs to increase efficiency and streamline operations.
- *Working Together*  
We encourage partnerships and cooperative agreements which enhance our ability to accomplish our mission.

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## **2. The Planning Process**

Butte County Office of Emergency Services (OES) is responsible for the development of the MHMP. The County OES hired a consultant, Bluecrane, Inc., (*bluecrane*) to assist in the preparation of the Plan.

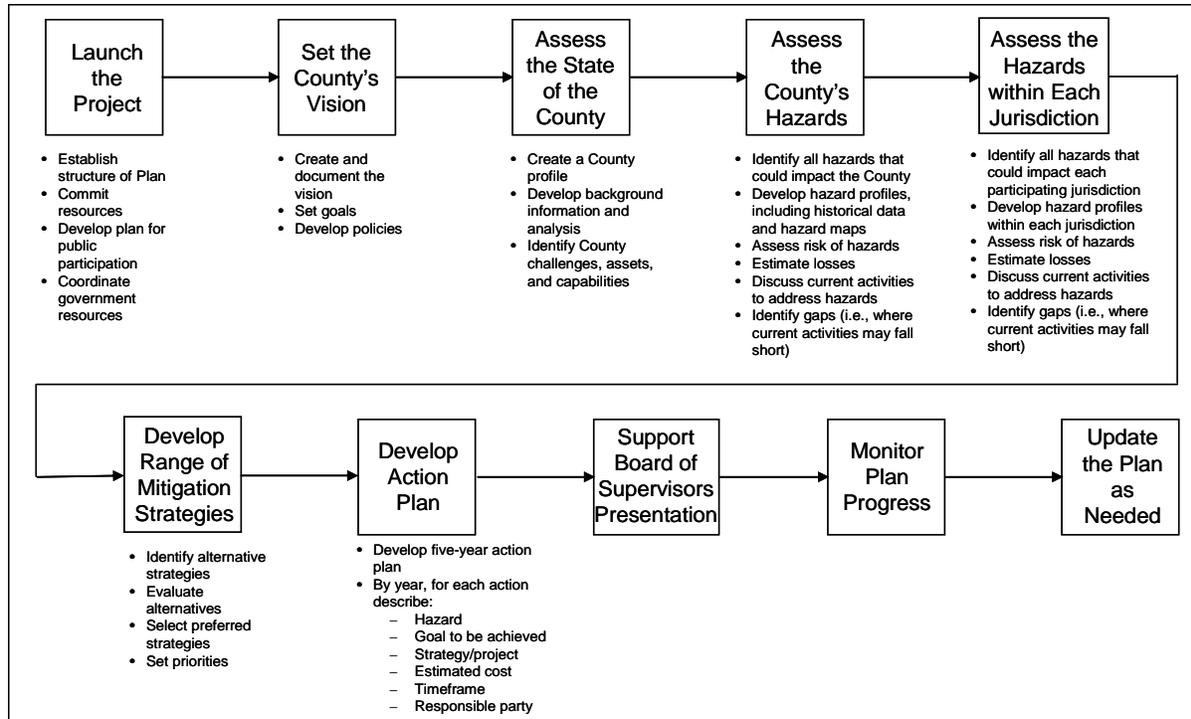
Butte County OES formed a Planning Team with representatives from all participating jurisdictions:

- County Office of Emergency Services
- County Department of Development Services
- County Department of Public Works, Land Development
- County GIS Division
- County Administrative Office
- County Sheriff's Department
- CDF/Butte County Fire Department (also serving City of Biggs and City of Gridley)
- City of Chico Fire Department – Fire Chief
- City of Oroville Fire Department – Fire Chief
- City of Oroville Administrator
- City of Biggs Administrator - Finance Director
- City of Gridley Administrator
- Town of Paradise Fire Department – Fire Chief
- Mooretown Rancheria

The planning process utilized by Butte County is depicted in the following figure.

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Following the County Board of Supervisors' approval of the project, *bluecrane* was retained to assist in the development of the MHMP. The effort was launched in March 2006 in a meeting of the Planning Team including *bluecrane*. The Planning Team has participated actively in the MHMP's development, conferring every two to three weeks throughout the process to review draft documents and assess progress on the plan.

In addition to numerous meetings of the stakeholders group and the general steps shown in the diagram above, throughout the process of developing the MHMP, numerous activities were continuously undertaken in the County and within each city to solicit public input. This was done through website postings, newspaper announcements, County Fair, Fire Safe Council meetings and general community meetings. Public comments and input included neighboring communities, agencies, businesses, academia, non-profits and other interested parties. The typical agenda for this interactive information sharing and input gathering sessions with the public included:

- An overview of the MHMP purpose and process,
- A broad overview of the Draft Plan as it stood at that time,
- A detailed interactive discussion of each hazard,
- Solicitation of all comments
- An interactive discussion of the next steps

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Following is a list of the various public outreach forums conducted in Butte County.

<b>Date</b>	<b>Event/Location</b>
April 22, 2006	Thermalito Grange Community Open House – Informational Table Display
July 7, 2006	Upper Ridge Coordinating Council Meeting – OES Presentation
July 26, 2006	Butte County Board of Supervisor’s Chambers Public Meeting
August 22 – 26, 2006	Butte County Fair – Shared informational booth with CDF/Butte County Fire Department
September 6, 2006	Butte County Fire Safe Council – OES Presentation

Photos from public review at the Butte County Fair and the Thermalito Grange



Early on in the planning process Butte County OES determined that mitigation strategy development would be enhanced by inviting other stakeholders to participate in the planning process. Representatives from the following key agencies were offered the opportunity to provide comments and/or participate in the planning process and their appropriate responses were integrated into the final draft of the plan.

- State DWR – Northern District
- Watershed Groups
  - Cherokee Watershed Group
  - Big Chico Creek Watershed Alliance
  - Little Chico Creek Watershed Group
  - Big Chico Creek Ecological Reserve
  - Butte Creek Ecological Reserve
  - Feather River/Lower Honcut Creek
  - Butte Creek Watershed Conservancy

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- Upper Ridge Wilderness, Inc.
- Friends of Butte Creek
- Concow Watershed
- Sacramento River Preservation Trust
- Butte County Resource Conservation District
- Butte County Fire Safe Council
- Water Districts
  - Biggs West Gridley Water District
  - Butte Water District
  - California Water Service Company
  - Del Oro Water Company
  - Durham Irrigation District
  - Durham Mutual Water Company
  - Paradise Irrigation District
  - South Feather Water and Power
  - Thermalito Irrigation District
- Pacific Gas & Electric
- Butte County Agricultural Commissioner's Office
- Butte County Association of Governments (BCAG)
- Bureau of Land Management
- Department of Agriculture-United States Forest Service, Plumas National Forest, Feather River Ranger District

The Butte County General Plan consists of a collection of 11 elements that were adopted between 1971 and 2004. Since its adoption, the existing Butte County General Plan has been supplemented and portions of it superseded by the adoption of area plans, updates to existing elements, and additions of new elements. Some of the elements have been amended, while most have not. The Land Use Element designates the general distribution of land uses, density and intensity standards for the unincorporated areas of the County. The Safety Element and the Seismic and Safety Element were both adopted in 1977 with no subsequent updates. These two elements provide a general evaluation of potential public safety hazards.

The County has begun a comprehensive update to the General Plan. This will include updating all of the elements, preparation of an environmental impact report and zoning ordinance. The MHMP will serve as an important resource in the General Plan update process. The County anticipates a three-year time frame for updating its general plan.

The CDF/Butte County Fire Department annually updates the Fire Management Plan (Community Wildfire Protection Plan – CWPP, as defined by the Healthy Forests Restoration Act – HFRA). The Plan identifies wildfire hazard areas based on GIS data and provides an action plan for reducing the damaging effects of wildfire in Butte

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County. It does this by identifying the high value high-risk areas using GIS in the County that can be destroyed by fire. It determines a comprehensive course of action including public information pertaining to fire safety, evacuation planning and fuel reduction to mitigate the threat and loss potential. The plan then identifies the necessary resources to implement improvements.

Butte County has also completed a Flood Mitigation Plan to provide guidance to agencies and the public responsible for and interested in protecting life, property, and livestock; involved in land use planning; responsible for administering the FEMA National Flood Insurance Program and responsible for responding to flood emergencies within Butte County.

The Butte County Department of Water and Resource Conservation has developed the Butte County Drought Preparedness and Mitigation Plan (Drought Plan) to protect the County from the effects of a drought. The Drought Plan includes, an institutional framework to approach drought; a monitoring plan; a response and mitigation plan; and a discussion of water transfers during a drought.

Butte County includes five incorporated Cities: Biggs, Chico, Gridley, Oroville and the Town of Paradise. Each city has a General Plan to guide development within the city limits and within the city's larger planning area. The plans for Butte County and the General Plans of the participating cities form the foundation for this integrated multi-hazard mitigation plan.

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**Local Capabilities Assessment**

This section list the County’s and participating jurisdiction’s strategy to utilized resources to achieve goals of reducing losses from future hazard events.

<b>Administrative and Technical Capability</b>	
<b>Human Resources</b>	<b>Department/Agency</b>
Emergency Managers	Office of Emergency Services County Managers City Managers Fire Departments CDF/Butte County Fire Department Police Departments Department Heads
Planner(s) or Engineer(s) with knowledge of land development, land management practices, construction practices related to buildings and/or infrastructure	Development Services Departments Public Works, Land Development
Floodplain Managers	Butte County Watershed Groups
GIS expertise	County GIS Division
Grant writers	Office of Emergency Services, City Manager’s Office, Fire Departments

<b>Fire Departments</b>	
<b>Asset / Capability</b>	<b>Inventory</b>
Rolling Stock / Equipment	<p style="text-align: center;"><b>CDF/Butte County Fire Department (Also serving the Cities of Biggs and Gridley)</b></p> <ul style="list-style-type: none"> <li>• 48 - Fire Engines</li> <li>• 1 - Ladder Truck</li> <li>• 2 - Heavy Rescues</li> <li>• 16 - Squads</li> <li>• 1 - Rescue Support</li> <li>• 18 - Water Tenders</li> <li>• 2 - Dozers</li> <li>• 1 - Air Attack Unit</li> <li>• 1 - Air Tanker</li> <li>• 1 - Hazardous Materials Units</li> <li>• 2 - Breathing Support Units</li> <li>• Level A, Level B and Proximity Suits</li> <li>• Hazardous Materials Special Equipment</li> </ul>

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<b>Fire Departments</b>	
<b>Asset / Capability</b>	<b>Inventory</b>
	<p><b>City of Chico Fire Protection</b></p> <ul style="list-style-type: none"> <li>• 12 - Fire Engines</li> <li>• 3 - Aerial Ladder Trucks</li> <li>• 1 - Technical Rescue Unit</li> <li>• 1 - Aircraft Crash Rescue Unit</li> <li>• 1 - Brush Patrol</li> <li>• 1 - Hazardous Materials Unit</li> <li>• 1 - Foam Trailer</li> <li>• 1 - Rescue Support Trailer</li> <li>• 1 - Breathing Support Trailer</li> <li>• 1 - FireSafe House Trailer</li> <li>• 3 - Command Vehicles</li> <li>• 6 - Support Vehicles</li> </ul> <p><b>City of Oroville Fire Protection</b></p> <ul style="list-style-type: none"> <li>• 4 - Fire Engines</li> <li>• 2 - Ladder Trucks</li> <li>• 1 - Aircraft Rescue Unit</li> <li>• 1 - Water Rescue Unit</li> <li>• 1 - Waverunner with Trailer and Support Equipment</li> <li>• 1 - Confined Space Rescue Unit</li> <li>• 1 - Trailer with Confined Space Equipment and Portable Air Supply</li> </ul> <p><b>Town of Paradise Fire Protection</b></p> <ul style="list-style-type: none"> <li>• 5 - Type I/II Fire Engines</li> <li>• 1 - Type II Truck</li> <li>• 3 - 4WD Utility Vehicles</li> <li>• 1 - 4WD Water/Rescue Vehicle</li> <li>• 1 - 8 Passenger Van</li> <li>• 1 - Type III Fire Engine (Wildland)</li> <li>• 1 - Type II Air Trailer (Hazardous Materials Support Unit)</li> <li>• 1 - 2WD Mini Pickup</li> </ul>
Resources	<p><b>CDF/Butte County Fire Department (Also serving the Cities of Biggs and Gridley)</b></p> <ul style="list-style-type: none"> <li>• 225 - Full Time Fire Fighters and additional Fire Fighters during the summer season</li> <li>• 130 to 160 (authorized strength of 400) – Volunteer Fire Fighters</li> <li>• 19 – Chief Officers</li> <li>• 3 – Training Officers</li> </ul>

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<b>Fire Departments</b>	
<b>Asset / Capability</b>	<b>Inventory</b>
	<ul style="list-style-type: none"> <li>• 5 – Prevention Officers</li> <li>• 4 Heavy Equipment Mechanics</li> <li>• 15 – Support Staff</li> <li>• Emergency Command Center (Dispatch)               <ul style="list-style-type: none"> <li>◦ 5 – Fire Captains</li> <li>◦ 1 – Battalion Chief</li> <li>◦ 6 – Dispatchers</li> <li>◦ 1- Telecommunications System Analyst</li> </ul> </li> <li>• 33 - Specialist/Technicians Interagency Hazardous Materials Team</li> <li>• 40 - Technical Rescue Team (TRT)</li> <li>• 35 - Drowning Accident Rescue Team (DART)</li> <li>• Retired Fire personnel</li> </ul> <p style="text-align: center;"><b>City of Chico</b></p> <ul style="list-style-type: none"> <li>• 66 - Full Time Uniformed Personnel</li> <li>• 3 – Support Staff</li> <li>• 36 - Volunteer Fire Fighters</li> </ul> <p style="text-align: center;"><b>City of Oroville</b></p> <ul style="list-style-type: none"> <li>• 22 - Full Time Personnel</li> <li>• 12 - Paid Call Fire Fighters</li> </ul> <p style="text-align: center;"><b>Town of Paradise</b></p> <ul style="list-style-type: none"> <li>• 22 - Full Time Paid Fire Fighters</li> <li>• 28 - Volunteer Fire Fighters</li> <li>• 2 - Full Time Support Staff</li> <li>• 4 - Part Time Support Staff</li> <li>• 5 - HazMat Specialist</li> <li>• 2 - Type 1 (Level A) HazMat Units</li> <li>• 7 - Technical Rescue Technicians</li> <li>• 4 - Rescue Drivers</li> <li>• 3 - Emergency Medical Technicians-Paramedics</li> <li>• 22 - Emergency Medical Technician</li> <li>• 22 - Emergency First Responders</li> </ul>
Facilities	<p style="text-align: center;"><b>CDF/Butte County Fire Department (Also serving the Cities of Biggs and Gridley)</b></p> <ul style="list-style-type: none"> <li>• 42 - Fire Stations (12 Butte County Fire Career Staffed Stations, 10 CDF Career Staffed Stations and 20 Butte County Fire Volunteer Stations)</li> <li>• 1 – Air Attack Base</li> <li>• 1 – Training Center</li> </ul>

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<b>Fire Departments</b>	
<b>Asset / Capability</b>	<b>Inventory</b>
	<p style="text-align: right;"><b>City of Chico</b></p> <ul style="list-style-type: none"> <li>• 6 - Fire Stations</li> <li>• 1 - Fire Training Center</li> </ul> <p style="text-align: right;"><b>City of Oroville</b></p> <ul style="list-style-type: none"> <li>• 1 – Fire Station</li> </ul> <p style="text-align: right;"><b>Town of Paradise</b></p> <ul style="list-style-type: none"> <li>• 3 – Fire Stations</li> </ul>

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<b>Local Ordinances and Regulations</b>	
Butte County Code, Chapter 8	The declared purposes of this chapter are to provide for the preparation and execution of plans for the protection of persons, the environment, and property within the County of Butte in the event of an emergency, the direction of the emergency services organization and the coordination of the emergency functions of the County of Butte with the Cities of Chico, Oroville, Gridley, Biggs and the Town of Paradise and all other affected public agencies, corporations, organizations and private persons within the County of Butte. (Ord. No. 3296, § 1, 12-10-96)
Butte County Code, Chapter 20	Improvement Standards for Subdivisions, Parcel Maps and Site Improvements.
Butte County Code, Chapter 24	Airport Air Zoning Ordinance. Under and pursuant to law and particularly the provisions of article 6.5 of chapter 2, division 1, Title 5, of the Government Code of the state known as the “Airport Approaches Zoning Law,” for the purpose of promoting the health, safety and general welfare of the inhabitants of the County of Butte by preventing the creation or establishment of airport hazards, thereby protecting the lives and property of the users of the Chico Municipal Airport and of the occupants of the land in its vicinity, and preventing destruction or impairment of the utility of the airport and the public investment therein in accordance with and as part of any future comprehensive master plan of the airports within Butte County. (Ord. No. 591, § 1)
Butte County Code, Chapter 38A	Fire Prevention and Protection. This chapter shall supplement and be in addition to the other fire prevention and protection statutes, regulations, and ordinances enacted by the state, the county or any other governmental agency having jurisdiction, including but not limited to Public Resources Code sections 4290 and 4291. (Ord. No. 3201, § 1, 4-25-95)
Public Resource Code (PRC) 4290	Fire Safe Regulations. These regulations have been prepared and adopted for the purpose of establishing minimum wildfire protection standards in conjunction with building, construction and development in State Responsibility Areas (SRA). The future design and construction of structures, subdivisions and developments in SRAs shall provide for basic emergency access and perimeter wildfire protection measures as specified in PRC 4290.
Public Resource Code 4291	PRC 4291 is the law requiring annual defensible space be provided for a distance of 100 feet around all structures in, upon, or adjoining any mountainous area, forest-covered lands, brush-covered lands, grass-covered lands, or any land that is covered with flammable material.
Public Resources Code 2694	PRC2694 states that a person who is acting as an agent for a transferor of real property that is located within a seismic hazard zone, shall disclose to any prospective transferee the fact that the property is located within a seismic hazard zone.

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<b>Local Ordinances and Regulations</b>	
Title 14 Public Resources Code	These regulations provided additional fire prevention and suppression standards.
Uniform Fire Code	This Code may be adopted by local jurisdictions, with amendments, and provides minimum standards for many aspects of fire prevention and suppression activities. These standards include provisions for access, water supply, fire protection systems, and the use of fire resistant building materials.
California Fire Code	The California Fire Code is the Uniform Fire Code with State of California amendments (this is the official Code for the State and all political subdivisions). It is located in Part 9 of Title 24 of the California Code of Regulations (Title 24 is commonly referred to as the California Building Standards Code). The California Fire Code is revised and published every three years by the California Building Standards Commission. Local jurisdictions have 180 days to make more restrictive amendments to the Code after it is released.
California Health and Safety Code and the Uniform Building Code	The Health and Safety Code provides regulation pertaining to the abatement of fire related hazards. It also requires that local jurisdictions enforce the Uniform Building Code, which provides standards for fire resistive building and roofing materials, and other fire-related construction methods.
Title 19 California Code of Regulations	These regulations pertain to fire prevention and engineering measures for new construction.
Title 14, Article 10 California Code of Regulations	Seismic Hazards Mapping. These regulations shall govern the exercise of city, county and state agency responsibilities to identify and map seismic hazard zones and to mitigate seismic hazards to protect public health and safety in accordance with the provisions of Public Resources Code, Section 2690 et seq. (Seismic Hazards Mapping Act).
Earthquake Safety and Public Buildings Rehabilitation Bond Act (Proposition 122)	In 1990, the State of California passed the Earthquake Safety and Public Buildings Rehabilitation Bond Act (Proposition 122). Up to \$50 million was allocated for the seismic retrofit of essential services facilities. Many local governments and special districts have retrofitted their essential services buildings with local funds.
Assembly Bill 337 (Bates Bill)	In response to the Oakland Hills, California fire of 1991, this bill was passed in 1992. It requires brush clearance and fire resistant roof material (Class A or B) to be used on all new construction that is located in areas designated as being a "Very High Fire Severity Zone."
California Civil Code 1103	This article mandates three natural hazard disclosures and consolidates these and previously required disclosures onto a statutory form called the Natural Hazard Disclosure Statement (NHDS). This form is now a legally required part of most residential property transactions.

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<b>Local Ordinances and Regulations</b>	
Alquist-Priolo Earthquake Fault Zoning Act	The Alquist-Priolo Earthquake Fault Zoning Act requires the state Geologist to identify earthquake fault zones along traces of both recently and potentially active major faults. The Alquist-Priolo Zones are usually one-quarter mile or less in width and proposed development plans within these fault zones must be accompanied by a geotechnical report prepared by a geologist describing the likelihood of surface rupture and other seismically induced hazards.

<b>Fiscal Capability</b>	
<b>Financial Resources for Hazard Mitigation Projects</b>	
General Fund	
Enterprise Fund (These funds are restricted to specific use, i.e. solid waste enterprise fund)	
Development fees (Restricted to expansion costs for new development)	
Building Permit fees	
Weed Abatement penalty fees	
Fees for water, sewer, gas, or electric service	
HR-2389 Secure Rural Schools and Community Self-Determination Act of 2000, Title III County Projects	
Impact fees for homebuyers or developers for new developments/homes	
State Funding Sources: Caltrans Commerce and Economic Development Program Infrastructure State Revolving Fund (ISRF) Program Rural Economic Development Infrastructure Program (REDIP) Proposition 13 Proposition 50 California Water Resources Control Board (WRCB) Clean Water State Revolving Fund (SRF) Program Watershed Protection Program California Department of Forestry and Fire Protection – Proposition 40 Watershed Protection Grant Program California Fire Safe Council (Grants Clearinghouse-distributes some Federal National Fire Plan Monies in California)	

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<b>Fiscal Capability</b>	
<b>Financial Resources for Hazard Mitigation Projects</b>	
<p>Federal Funding Sources:</p> <ul style="list-style-type: none"> <li>FEMA</li> <li>Housing and Urban Development (HUD) Community Development Block Grant Program</li> <li>U.S. Army Corps of Engineers (USACE)</li> <li>Small Business Administration (SBA) Funding</li> <li>U.S. Department of Agriculture (USDA) Programs</li> <li>Natural Resources Conservation Service (NRCS) - Environmental Quality Incentives Program (EQIP)</li> <li>Small Watershed Program</li> <li>Flood Prevention Program</li> <li>Emergency Watershed Protection (EWP) Program</li> <li>Homeland Security Grants (terrorism)</li> <li>Bureau of Land Management (BLM) Programs (National Fire Plan)</li> <li>United States Forest Service (National Fire Plan)</li> <li>United States Fish and Wildlife Service (National Fire Plan)</li> <li>Bureau of Indian Affairs (National Fire Plan)</li> </ul>	

<b>In-progress/On-going/Completed Mitigation Projects and Programs</b>		
Program or Project	Status	Description
Multi-Jurisdictional Hazard Mitigation Plan	In-Progress	Preparation of a Multi-Jurisdictional Pre-Disaster Hazard Mitigation Plan for Butte County and the following participating jurisdictions: Biggs, Chico, Gridley, Oroville, Town of Paradise.
Floodplain Management Plan	Completed	Countywide Flood Mitigation Plan.
Fire Management Plan		Butte County Community Wildfire Protection Plan addressing fire risk and mitigation strategies.
Hazardous Materials Emergency Response Plan	Completed	Countywide Hazardous Materials Emergency Response Plan was developed to fulfill legislative requirements to assume responsibility of a Permanent Household Hazardous Waste Collection Facility.
Household Hazardous Waste and Used Oil Grant Program	Ongoing	This program funded by grants from the California Integrated Waste Management Board, allows growers and ranchers to drop off up to 55 gallons of used oil at pre-selected locations.

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<b>In-progress/On-going/Completed Mitigation Projects and Programs</b>		
<b>Program or Project</b>	<b>Status</b>	<b>Description</b>
Drought Preparedness and Mitigation Plan (Drought Plan)	Completed	This plan has been developed to provide an efficient and systematic process for the County that result in a short- and long-term reduction in drought impacts to the citizens, economy and environment in Butte County.
Annual Countywide Disaster Drills	Ongoing	Members of the participating jurisdictions' Police and Fire Departments, Office of Emergency Services personnel, and Emergency Managers participate in annual disaster tabletop and/or field exercises.
ICS / SEM Training	Ongoing	Incident Command System / Standardized Emergency Management System training for appropriate personnel.
Fire Department Equipment	Completed	Purchase of 100 self-contained breathing apparatus units, fitness equipment, hand-held radios, protective equipment (helmets, gloves, masks, etc.).
Butte County's Protection, Mitigation and Enhancement Report	Completed	Report on reducing toxic air pollution from naturally occurring asbestos on existing gravel roads.
Butte County Radio System Study	Completed	Study of the County's radio and microwave systems which are the backbone for emergency communications.
Pest Exclusion Program	Ongoing	This program provides protection to the County by regulatory control through the use of quarantines to prevent the introduction of pests, which are not known to exist or are of very limited distribution within the County.

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### **3. County Community Profiles**

#### **Butte County**

Butte County lies in north central California at the northern end of the Sacramento Valley, approximately 150 miles northeast of San Francisco and 70 miles north of Sacramento. State Highways 70 and 99, which extend in a north-south direction through the County, define the principal transportation corridors connecting the County to the region. State Routes 32 and 162 provide sub-regional connections to areas to the west of the County and to Interstate 5.

The County contains five incorporated cities: Chico, Oroville, Gridley, Biggs, and the Town of Paradise, and several small unincorporated rural communities. The U.S. Forest Service is a major landowner in Butte County with holdings in Plumas National Forest (81,972 acres) and Lassen National Forest (49,240 acres). The U.S. Bureau of Land Management owns 18,960 acres, consisting of scattered foothill lands. Combined, these two Federal agencies own and control 12.3 percent of the land area in Butte County.

Butte County covers an area of approximately 1,670 square miles and can be divided into three general topographical areas: a valley area, a foothill region east of the valley area, and a mountain region east of the foothills. These topographic areas comprise approximately 46 percent, 23 percent and 31 percent, respectively, of the County's land. Butte County is watered by the Feather River and the Sacramento River. The County in general is drained by the Feather River, Butte Creek and Chico Creek Watersheds. Part of the County's western border is formed by the Sacramento River.

Butte County has rich fertile valley soil, rolling hills, volcanic peaks and mesas and some of the most dramatic canyons carved by beautiful streams and rivers. Butte County is a diverse 1,068,000 acres. Its highest point is Humboldt Peak at 7,870 feet, while the lowest point is about 90 feet above sea level. Large areas of this rural area are preserved unaltered in the nearly 60,000 acres of parkland and wildlife preserves within the county. The valley remains a vital wintering site for 60% of the waterfowl that migrate through the Pacific Flyway. Ducks, geese, swans and many other graceful birds literally cover the sky from November through March. From mid-February to mid-March, Butte County's countryside of almond, prune, kiwi, pear and apple orchards blossom into color. The orchard show is followed by an encore of spectacular wildflowers that bloom throughout the area from March to June.

#### **City of Biggs**

The City of Biggs is located in the southwest portion of Butte County, approximately five miles north of the City of Gridley. State Route 99 runs in a north-south direction east of the city, and the Union Pacific Railroad extends through the center of the city.

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The City of Biggs was founded in 1903 with the development of the area's agriculture and the construction of the California and Oregon Railway, now known as the Union Pacific Railroad. The growth of the city has hinged on agricultural development. Small fruit and field-crop farms and large rice-growing ranches presently occupy a major portion of the immediately surrounding area. The rice industry is a major influence on the community's economy. Local economic growth is tied to agricultural productivity and the demand for local goods and services, as prospects for non-agricultural development appear limited. Biggs offers a small commercial core area that serves most daily needs of its residents, but most shopping for major items occurs in other population centers.

**City of Chico**

The City of Chico is located in the northwest quadrant of Butte County, about 100 miles north of Sacramento and 70 miles south of Redding. The City of Chico is bisected by State Route 99, which runs in a north-south direction. State Route 32, which runs east-to-west, intersects State Route 99 near the center of the city.

Founded in 1860 by John Bidwell, the City of Chico has grown from an individual rancho to the center of economic activity of the Tri-county area, which includes Butte, Glenn, and Tehama counties. Chico is home to two regional malls and major discount retailers. Also, Chico is a major medical and education center servicing much of the entire northeastern part of California.

**City of Gridley**

The City of Gridley is located in the southwest corner of Butte County, approximately five miles south of the City of Biggs. State Route 99 runs in a north-south direction through the eastern portion of the city, and the Union Pacific Railroad extends through the center of the city.

The City of Gridley was founded in 1905 as an agricultural service center built upon and surrounded by prime agricultural soils. The City has a small commercial area that serves most daily needs of its residents, but most shopping for major items occurs in the other population centers (e.g., Chico or the Marysville-Yuba City area).

Development in Gridley since the mid-1970s has been primarily single-family residential in character. Developments around the city's periphery has begun to depart from the traditional grid street system by incorporating curved street patterns and non-continuous streets. Some of the internal street patterns do not include adequate provisions for canal-crossings or other connections with the surrounding street systems. Consequently, some recent developments have obstructed orderly expansion of the community.

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**City of Oroville**

The City of Oroville is located in southeastern Butte County along the Feather River, on the southwestern side of Lake Oroville. The city is bisected by State Route 70, which runs in a north-south direction, and by State Route 162, which runs in an east-west direction. State Route 99 extends north-south four miles west of the city limits.

Oroville is the seat of County government in Butte County. Diverse economic activities have historically shaped the city and include: gold mining, agriculture, railroads, lumber processing, and dam construction and operation. Oroville Dam, completed in 1968, is the centerpiece of the California Water Project.

Oroville grew rapidly during the Gold Rush, but lost population as mining activity declined. A second population boom coincided with construction of the Oroville Dam, which was completed in 1968. More recent growth in the area has been largely due to urban-to-rural migration, rather than major economic activity in the area.

Major sources of economic growth and employment in the Oroville area are wood products and agriculture. The seasonal nature of employment in these industries has contributed to cyclical variations in the community's economy. The tourist-related economy, also seasonal, has added to this problem, although the impact of Indian casinos has somewhat stabilized the seasonal nature of the tourism industry. Other local industries, such as banking and services, have lent some stability to the city's business climate. Residents of the area generally also work and shop there, except when making major purchases.

The Oroville area is characterized by low-density, scattered development with many vacant parcels. The highest density residential development in the Oroville area is located within the Oroville city limits, although this development is primarily single-family in character with a scattering of apartments, mobile homes, and mobile home parks. The city also contains principal centers of commercial development, located in the downtown area. Industrial development is mainly limited to a band extending from downtown Oroville to Ophir Road between State Route 70 and Lincoln Boulevard.

**Town of Paradise**

The Town of Paradise is located at the juncture of the western slopes of the Cascade and Sierra Nevada systems in north central Butte County. Topography and drainage patterns have had a major influence on development patterns in the area. This area is defined by steep canyons - to the east by the West Branch of the Feather River drainage, and to the northwest by the Butte Creek-Little Butte Creek drainage. The Town of Paradise occupies an area identified as the Lower Ridge, which ranges from 2,200 feet in the north to 1,500 feet at the town's southern boundary.

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Originally settled during the Gold Rush era, the Town of Paradise and surrounding area grew very slowly during the first half of this century. The Town of Paradise is predominately residential in character, and most of its dwelling units are single-family units. Multi-family units, at densities ranging from 8 to 12 units per acre, are found primarily in central Paradise, near commercial uses and along major arterial streets.

The town's central business district consists of a narrow band of commercial uses along both sides of the Skyway generally between Black Olive Drive and Maxwell Drive. The town contains relatively little industrial development. Agricultural uses, including vineyards, orchards, and grazing land, are located primarily in the southern third of the town.

**Population**

Butte County currently has a population of just over 210,000 and has increased at a rate of 3 percent per year since 1970 (Butte County General Plan, 2000). Approximately 54 percent of Butte County's population resides in the cities of Biggs, Chico, Gridley, Oroville, and the Town of Paradise and 45 percent reside in the unincorporated areas of the County.

Area	2000	2003*
Butte County	203,171	210,400
City of Biggs	1,793	1,810
City of Chico	59,954	68,600
City of Gridley	5,382	5,750
City of Oroville	13,004	13,250
Town of Paradise	26,408	26,700

Source: U.S. Census Bureau, Census 2000

\* State of California, Department of Finance Projection

**Climate**

Butte County has a Mediterranean climate with cool, wet winters and hot, dry summers. Precipitation is normally in the form of rain, with snow in the higher elevations, and ranges from approximately 20 to 80 inches per year.

Quarterly reports for Butte County weather over a 30-year average show January's high temperature at 54 degrees, while the low is typically 36 degrees. Rainfall is at 5.32 inches, with humidity at 59%.

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Description	Measurement
July average daytime high	96°F
January average daytime high	55°F
Annual average rainfall (in.)	29 in.
Annual average snowfall (in.)	0 in.

Source: Western Regional Climate Center

**Geography**

Butte County encompasses just over one million acres of land and is divided almost in half by two topographical features: the foothills and mountainous region of the northern Sierra Nevada and the Southern Cascade Mountains in the northeast and the valley section in the southwest. According to the Butte County General Plan, elevations range from over 7,000 feet in the mountainous region to 60 feet in the valley section.

Area: Approximately 1,677 square miles

Land Area Acres: 1,073,280

Elevation: 230 feet above sea level

Highest point: Humboldt Peak at 7,870 feet

Lowest point: 90 feet above sea level

**Economy**

Year	Time Period	Industry Title	No. of Employed
2006	Jan	Total Wage and Salary	75,400
2006	Jan	Total Non-Farm	73,300
2006	Jan	Service Providing	65,400
2006	Jan	Total Private	56,800
2006	Jan	Residual-Private Services Providing	48,900

Source: State of California, Employment Development Department

**Transportation Systems**

Butte County's location allows products to be trucked to any U.S. West Coast city within a single day. State Highway 99 provides north/south access through the county, while Highway 70 offers additional access south to Sacramento or points east to Reno. Nearby Interstate 80, the nation's east-west artery, and two Union Pacific Railroad lines provide ready access for national distribution. Butte County's proximity to the deep-water ports of Sacramento, Stockton, and Oakland ensure access to international markets within a

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matter of hours. Daily commuter flights shuttle passengers to large metropolitan areas, while overnight couriers offer immediate worldwide transport of merchandise.

Two Union Pacific rail lines serve Butte County. The first connects Chico, Biggs, and Gridley north to Oregon and south to Sacramento. The second runs through Oroville, up the Feather River Canyon toward Idaho, and south to Sacramento.

Butte County has two major state highways, the first of which is State Highway 99. State Highway 99 connects Butte County with Interstate 5 traveling north, and continues south to Yuba City and Sacramento. Highway 99 is fast and straight its entire length in Butte County, with fifteen miles of four-lane freeway through Chico.

The second major highway in Butte County is State Highway 70. Highway 70 connects the county to areas east, including Reno and Interstate 80 traveling east, and continues south to Marysville and Sacramento. The southern three-quarters of Highway 70 is fast with eight miles of four-lane freeway through Oroville and six miles of four-lane road north of its Lake Oroville crossing. Then it winds up the North Fork of the Feather River canyon on its way east through the mountains.

Other highways in Butte County include State Highway 149, a short, well-traveled connector between Highway 99 and Highway 70. It helps connect the County Seat of Oroville with Butte County's largest city, Chico. State Highway 32 connects Chico to Orland and Interstate 5 to the west, and Lake Almanor, Lassen National Park, and Susanville to the northeast. The highway is fast east and west of Chico, but becomes a city street as it travels through Chico.

State Highway 162 is a lightly traveled, straight, and fast highway connecting Oroville to Willows and Interstate 5 to the west, then becomes a winding road as it connects Oroville to Quincy to the east. As it travels through Oroville, Highway 162 becomes a city street.

**Major Recreation Areas**

Bidwell Park is the third largest municipal recreation area in the nation and offers 35 miles of trails for hiking, bicycling, skating, horseback riding, and jogging. Swimming holes, picnic areas, baseball diamonds, a golf course, and playgrounds dot the eleven-mile park. Big Chico Creek runs the length of the park, winding its way through spectacular bluffs and later through the valley floor, where towering broad-leafed trees provide shade during hot summers.

The drive along the Olive Highway, near Oroville, will take you to Feather Falls the sixth largest waterfall in the nation, which reaches a magnificent 640 feet. You can view

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breathtaking scenery from the uphill hiking trail.

Houseboats, patio boats, power boats, sail boats, and water-skiing enthusiasts all enjoy Lake Oroville—with its 15,810 surface acres of warm water and its 167 miles of shoreline. The recreation facilities are operated by the State Department of Parks and Recreation. Two marinas serve vacationers' needs, from fishing boats to 16-sleeper houseboats, to floating campsites.

Fishing opportunities are so numerous in the county that it would be impossible to list them all. In addition to the salmon, trout, catfish, and shad to be found in the Feather and Sacramento rivers, Lake Oroville is one of the best bass fishing locations in the state.

Butte County is a well-known destination for hunting deer, bear, game birds or waterfowl. Popular spots for deer are near Feather Falls and Inskip. The major game birds in this area are quail, dove, turkey, pheasant, pigeon, and migratory waterfowl.

**Top Attractions**

Oroville is most famous now because it is the site of the Oroville Dam, one of the 20 largest dams in the world and the tallest dam in the US. Standing 770 feet high and 6,920 feet across the top. This is one of the most important parts of the California State Water Project or Central Valley Project, which moves water from water-rich Northern California to water-poor Southern California. This facility is operated by the Department of Water Resources which is undergoing license renewal with the Federal Energy Regulator Agency; negotiations have included the City of Oroville and Butte County. The Oroville Dam is responsible for the creation of Lake Oroville, which has a 24-square mile surface area and 167 miles of shoreline. Below the dam is a cavern that houses six power generation units capable of generating 2.8 billion kilowatt hours of power annually.

Chico is the site of Bidwell Park, the seventh-largest municipal park in the United States, Bidwell Mansion State Historic Park, the Chico University Arboretum, and home to the tallest building between Sacramento, CA and Portland, OR. Chico is also the home of California State University, Chico which ranks among the nation's top colleges.

Sierra Nevada Brewing Company is based in Chico. Butte Creek Brewing Company, maker of hand-crafted organic ales, is also located in Chico.

Butte County Pioneer Memorial Museum is a replica of a 49er cabin enlarged to hold 6,000 sq. feet of historic treasures. County artifacts and Native American arrowhead and basket collections are one of the most extensive in the area.

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Chico Museum features changing exhibits focusing on the rich and diverse history and culture of Chico and Butte County. Permanent exhibits include altars and artifacts from Chico's Chinese Taoist Temple and a historical timeline of history from 1830-present.

The Oroville Chinese Temple and Garden stands as a reminder of the influence the Chinese culture had in Oroville. The Temple was built in 1863 to support the Chinese community of 10,000. Three chapels and a main chapel served as a place of worship for Taoism, Confucianism and Buddhism.

Clay Pit State Vehicular Recreation Area provides good beginner terrain for off-road enthusiasts. The clay used to build Lake Oroville was taken from this 220-acre site, three miles west of Oroville. The resulting depression is a large shallow pit ringed with low hills. It is also a motorcycle, all-terrain vehicle, and dune buggy use area. Call in advance to determine riding conditions.

Feather Falls is the sixth highest waterfall in the nation, which reaches a magnificent 640 feet. The Feather River Fish Hatchery accommodates 9,000 adult salmon and 2,000 adult steelhead as well as incubators containing up to 20 million eggs and 9.6 million fingerlings. June and September are the best months to visit as the fish can be viewed jumping the ladders in the hatchery for their Fall and Spring spawning season.

The 9,100 acre Gray Lodge Wildlife Area in Gridley is one of the most intensively managed waterfowl marshlands in the United States which offers excellent opportunities for hunting, fishing, photographing, and nature viewing

Oroville State Wildlife Area is an 11,000 acre wildlife area. Bird watching is popular in this beautifully preserved natural area and camping, fishing and hunting opportunities are available. Egrets, beaver, and river otter are among the many animals found here.

Oroville's most famous resident, Ishi, last of the Yahi Indians, was considered to be the last "Stone Age" Indian to come out of the wilderness and into western civilization. When he appeared in Oroville around 1911, he was immediately thrust into the national spotlight. The Visitor's Center at Lake Oroville has a thorough exhibit and documentary film on Ishi and his life in society.

Several movies have been filmed in Butte County, including "*Gone with the Wind*, *Friendly Persuasion*, *Magic Town*, *The Klansman*, *Ruby Ridge: An American Tragedy* and *The Adventures of Robin Hood*.

The following maps depict the location of Butte County and the Cities of Biggs, Chico, Gridley, Oroville and the Town of Paradise.

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**Butte County  
General Plan**



Date printed: June 6, 2003

Source: Butte County Department of Development Services, 2003



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**Historical Setting**

Butte County, the “Land of Natural Wealth and Beauty” was one of the original California counties, created in 1850 at time of statehood. Part of the County's territory was given to Plumas County in 1854 and to Tehama County in 1856. Original inhabitants included the Mechoopda and Concow bands of the Maidu Indians. Four recognized tribes still survive today in the County.

Butte County was named for the Sutter Buttes, the very prominent small range of hills on the valley floor, west of Gridley. The word butte is derived from the Teutonic word meaning "a blunt extension or elevation." In the French language, it signifies "a small hill or mound of earth detached from any mountain range."

The Buttes have had many names over the years. The Maidu Indians called them "Histum Yani" which translates as, "Middle Mountains of the Valley" or "Spirit Mountain". According to Maidu legend, after death, the spirits of their people rest in the Buttes. Other names for the Buttes were "Marysville Buttes", "Sacramento Buttes", and "Los Tres Picos." They were finally named the "Sutter Buttes" in 1949.

Gabriel Moraga, a Spaniard trying to locate possible mission sites, was the first European to see the Sutter Buttes in 1806. Another Spaniard, Luis Arguello, led an expedition in 1817 to explore Northern California by water. He called the Buttes "Los Picachos" or the peaks. He also named the Feather River "El Rio de la Plumas", because he saw many feathers of wild fowl floating on the water.

The first County seat was Hamilton. In 1853 it was moved to Bidwell's Bar, then in 1856 to Oroville which is the County seat today.

**Governing Bodies**

The County seat is Oroville. The County of Butte is divided into five supervisorial districts. The districts vary in size to provide for an equal distribution of the County's population, not geographical size. District division based on population is designed to give all citizens of the County equal representation on the County Board. Butte County Charter Article II, Section 6 reads “Whenever the United States Census shows that the population of any supervisorial district exceeds or lacks more than 23 percent as compared with the population in another district or districts, the Board shall change the boundaries of such district or districts so that the population of each district shall be so nearly equal as possible.” District lines can change, and consideration of this process takes place following Census years.

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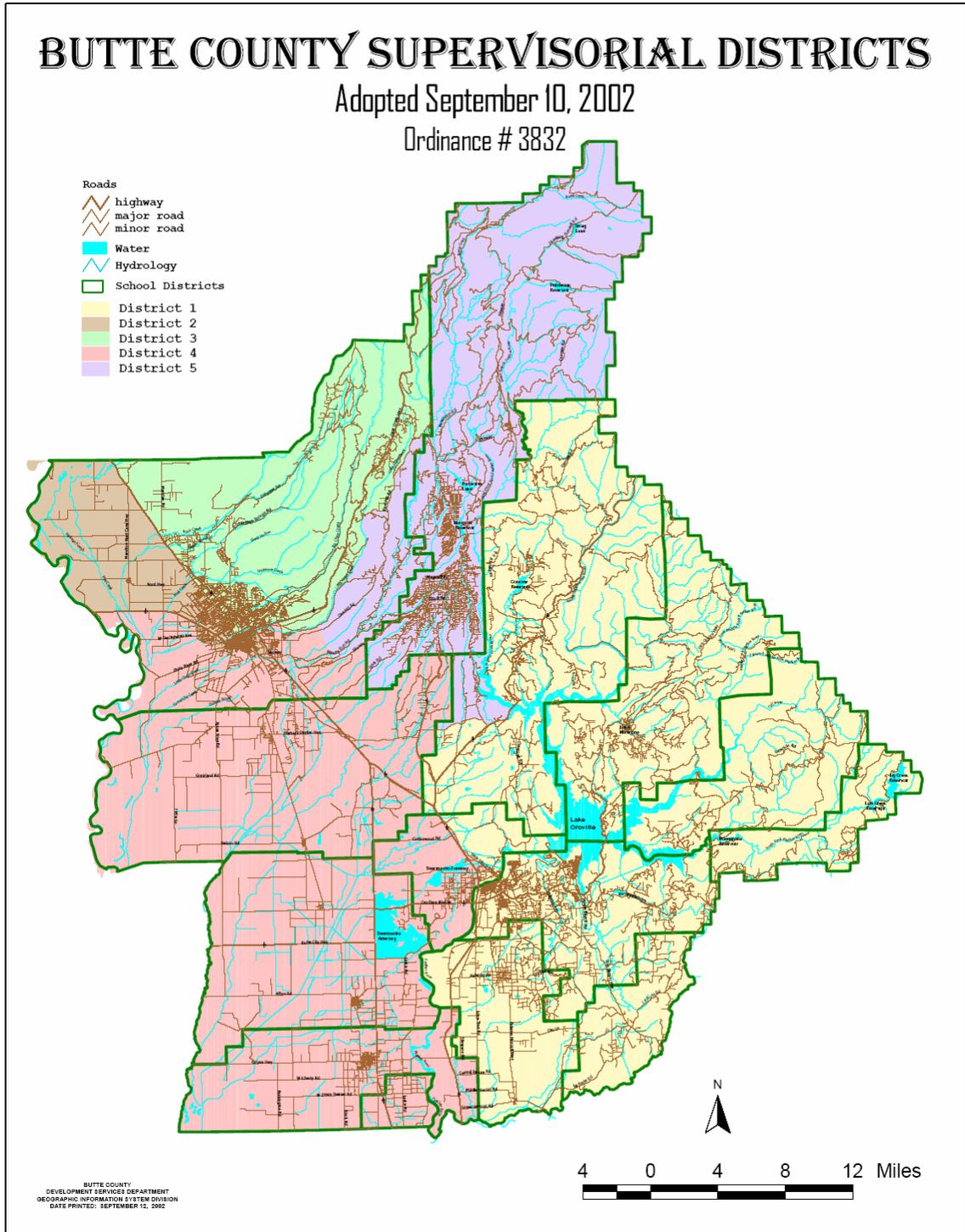
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Each district elects a Supervisor to represent that district on the County Board of Supervisors. The term of office for a Supervisor is four years, and there is no limit on the number of terms a member may serve. Supervisors must be a resident of the district they represent at the time they are elected, and they must remain a resident of that district while in office. At the beginning of each year the Board elects a new Chair and Vice Chair.

The following map outlines the supervisorial districts.

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**Land Use and Development Trends**

**Butte County**

The total land area of Butte County is approximately 1,670 square miles or 1,068,000 acres. The two most important factors affecting land use patterns in the County are geographic conditions and political jurisdictions. Geographic conditions, particularly climate, topography, and vegetation, create three recognizable and distinct landscape units within Butte County: Valley, Foothills, and Mountains. These landscape units comprise approximately 46, 23, and 31 percent, respectively, of the County's land.

Historically, land use patterns in Butte County have been closely related to the natural characteristics of the County's main geographic areas. Each of the three geographic areas (Valley, Foothills, and Mountains) has provided a context for the development of its own set of industries and land use patterns. The industries associated with each area are frequently nontransferable economic activities; that is, they are highly dependent upon the preservation of local geographic and land use conditions. For example, the cultivation of almonds and other orchard crops, a major industry in Butte County, is dependent on the deep rich soils of the valley in order to thrive, and the timber industry is dependent on the forests in the higher altitudes of the east County.

Butte County possesses fertile soils, abundant water resources, and a relatively long growing season. Agriculture continues to be one of the major elements of the County's economic base despite greater diversification over the past decade. Because the soils and operating systems are different for cultivated agriculture and livestock ranching, particularly for cattle and sheep, agriculture in Butte County is divided into two sub areas: 1) orchard and field crops, which includes field crops, seed crops, vegetable crops, fruit and nut crops, nursery stock, and apiary products; and 2) grazing and open land, which involves animal husbandry forms of agriculture.

Urban land constitutes a proportionally small share of total land area in Butte County. In 2000, the most recent year that the Division of Land Resource Protection in the California Department of Conservation has data for Butte County, urban land uses occupied 62.7 square miles or 4 percent of all County land in 2000 (Farmland Mapping and Monitoring Program (FMMP)). In 2000, incorporated areas of the County accounted for 3.6 percent of all County land, according to U.S. Census data.

The County's urban areas are located in the valley, with the exception of the Paradise and Magalia/Upper Ridge areas located in the mountains. Their locations reflect their history: located adjacent to the prime agricultural lands which were their economic backbone and adjacent to the major transportation corridors (the Union Pacific Railroad and Highways 70, 32, and 99).

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The direction in which the communities have grown also reflect changes that have occurred over time, such as the shift from one transportation system (trains) to another (motor vehicles), the development of new infrastructure (such as Lake Oroville), and the decline in natural resources (e.g., the establishment of the Greenline in Chico to protect prime agricultural land). Growth among major educational institutions such as CSU Chico and Butte College also influences regional growth in Butte County.

Traditionally, urban development in Butte County has been concentrated in the urban areas formed by the County’s five incorporated communities. Up to the 1960s and 1970s, development in these areas occurred primarily within the communities’ corporate boundaries. More recently, however, much of the development activity has taken place on the periphery of established communities. Some of this development has taken place under the jurisdiction of cities, but much of it has not.

In addition to the development in the established urban areas, the 1970s saw a sharp increase in the amount of development that occurred throughout the foothill areas of the County, beyond the existing urban areas. This development was associated with the influx of retirement age residents who moved to Butte County specifically to live in a more rural setting, away from the urban centers. This development is dispersed throughout foothill areas (generally below the snow line), but with varying concentrations near pre-existing unincorporated rural communities.

Currently a small percentage of land in Butte County is devoted to urban uses, while the majority of Butte County’s land uses include agriculture, timber, and grazing. Existing land use within Butte County is a mosaic of varying types of uses, ownership, character, and intensity. The existing Land Use Element sets forth 14 land use categories that apply to incorporated and unincorporated areas of the County.

The following table lists the 14 land use categories along with the primary allowable land uses for each designation.

**Summary of Existing Land Use Designations  
Butte County General Plan Land Use Element**

<b>Land Use Designation</b>	<b>Primary Land Uses</b>
Orchard and Field Crops	Cultivation, harvest, storage, processing, sale and distribution of all plant crops, especially annual food crops.
Grazing and Open Land	Livestock grazing, animal husbandry, intense animal uses and animal matter processing.
Timber-Mountain	Forest management and the harvesting and processing of forest products.
Agricultural Residential	Agricultural uses and single-family dwellings at rural densities.

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Land Use Designation	Primary Land Uses
Foothill Area Residential	Single family dwellings at rural densities.
Low Density Residential	Detached single-family dwellings at urban densities.
Medium Density Residential	A mixture of urban residential uses, including, detached single-family homes, condominiums, multiple-dwelling structures, mobile home parks, group quarters and care homes.
High Density Residential	Higher-density urban residential uses, including condominiums, multiple-dwelling structures, mobile home parks, group quarters and care homes.
Commercial	Structures and activities providing a full range of merchandise and services to the general public.
Industrial	Processing, manufacturing, packaging, storage and distribution of goods and commodities.
Research and Business Park	<p>Allowable uses are narrowly defined to assure compatibility between uses. Industrial uses are limited to those manufacturers engaged in the production of low volume, high value products, and particularly advanced technology products. Businesses requiring outdoor production and storage are prohibited. Following is a partial, representative listing of the primary permitted uses:</p> <ol style="list-style-type: none"> <li>1. High and advanced technology, research and development uses, laboratories, including university-based research and facilities used for testing and analysis of products or uses.</li> <li>2. Business and professional corporate headquarters, regional offices, and data processing facilities.</li> <li>3. Uses that emphasize product development over high volume production in order to minimize traffic associated with the transportation of raw materials and products, and other nuisance factors.</li> </ol>
Public	Large facilities owned and operated by government agencies, including schools, colleges, airports, dams and reservoirs, disposal sites, recreation facilities, conservation areas, fire stations and other government buildings and property.
Sports and Entertainment	Examples of uses that are considered appropriate under this classification include, but are not limited to a golf course; an amphitheater for use as an open air entertainment facility; eating and drinking establishments; food and beverage sales; vehicle repair services; gasoline service stations; public buildings; hotels and motels; offices; RV Park.
Solid Waste Management Facility Combining Designation	Uses that are accessory and/or related to solid waste and/or septage disposal.

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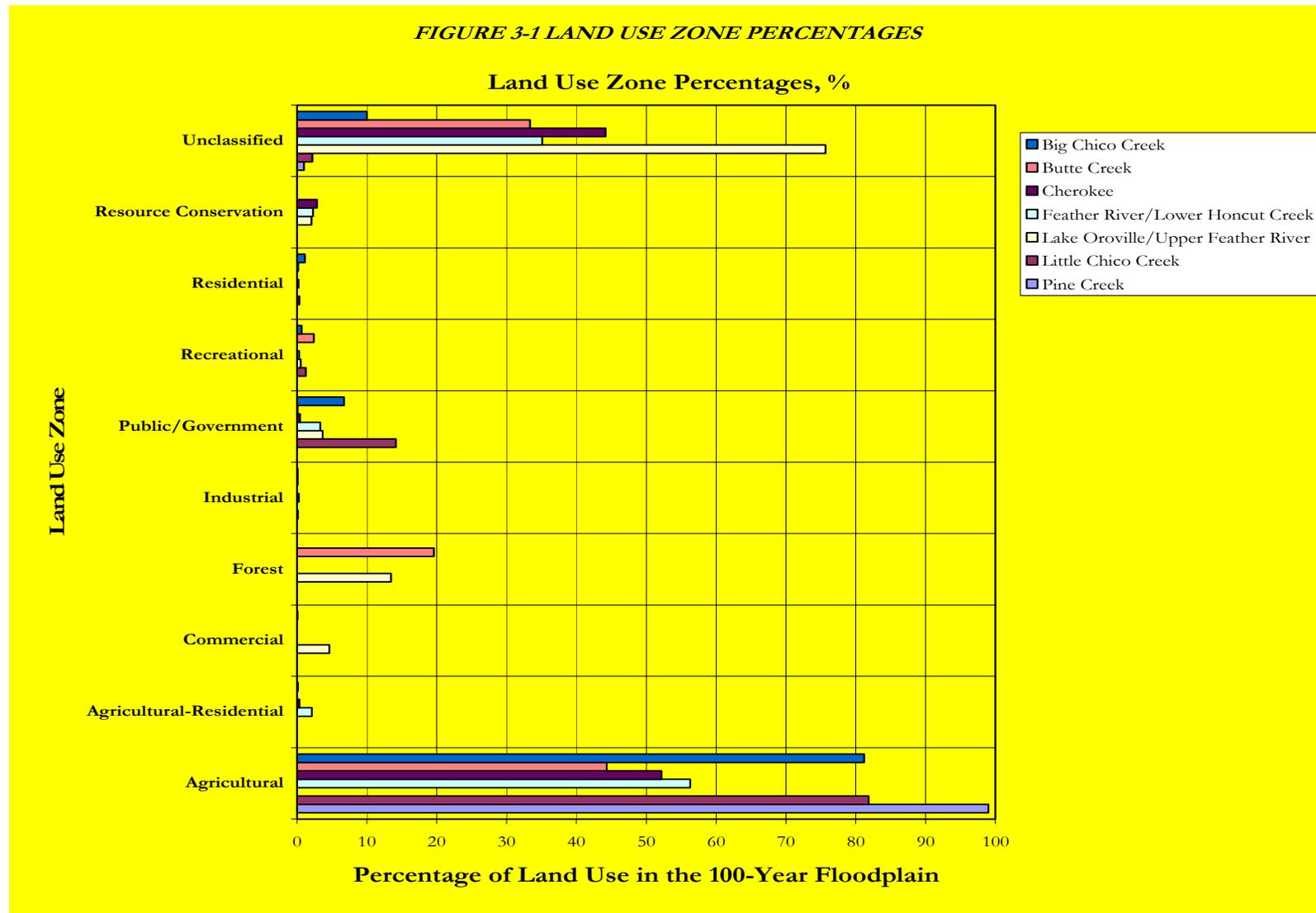
Butte County's boundaries became fixed in 1856. Recent population growth continues to increase and was at approximately 11.6 percent from 1990 to 2000, compared 13.6 percent for California (U.S. Census Bureau, 2003). According to the Butte County General Plan, migration from California's metropolitan areas is expected to continue and would represent the largest part of the County population growth in coming years. The City of Chico anticipates that growth in the urban area would move toward the northeast and southeast, as infill opportunities become limited and as Greenline policies restrict growth to the west (Butte County Master Environmental Assessment, 1996).

A small percentage of land in Butte County is devoted to urban uses, while the majority of Butte County's land uses include agriculture, timber, and grazing. According to the Butte County 2005 land use zoning data, all of the watersheds in Butte County, except for the Lake Oroville/Upper Feather River watershed, have the greatest land use in agriculture (See the following figure from Butte County's Flood Mitigation Plan, January 2006).

The relatively minimal reported damages and loss of life attributed to flooding over the past 25 years in Butte County indicates that the current land use management practices in Butte County have proven effective. However, increasing development and population growth will require disciplined land use management practices to ensure that urbanization of land protected by levees does not occur and is not allowed to exacerbate the affects of flooding in other areas.

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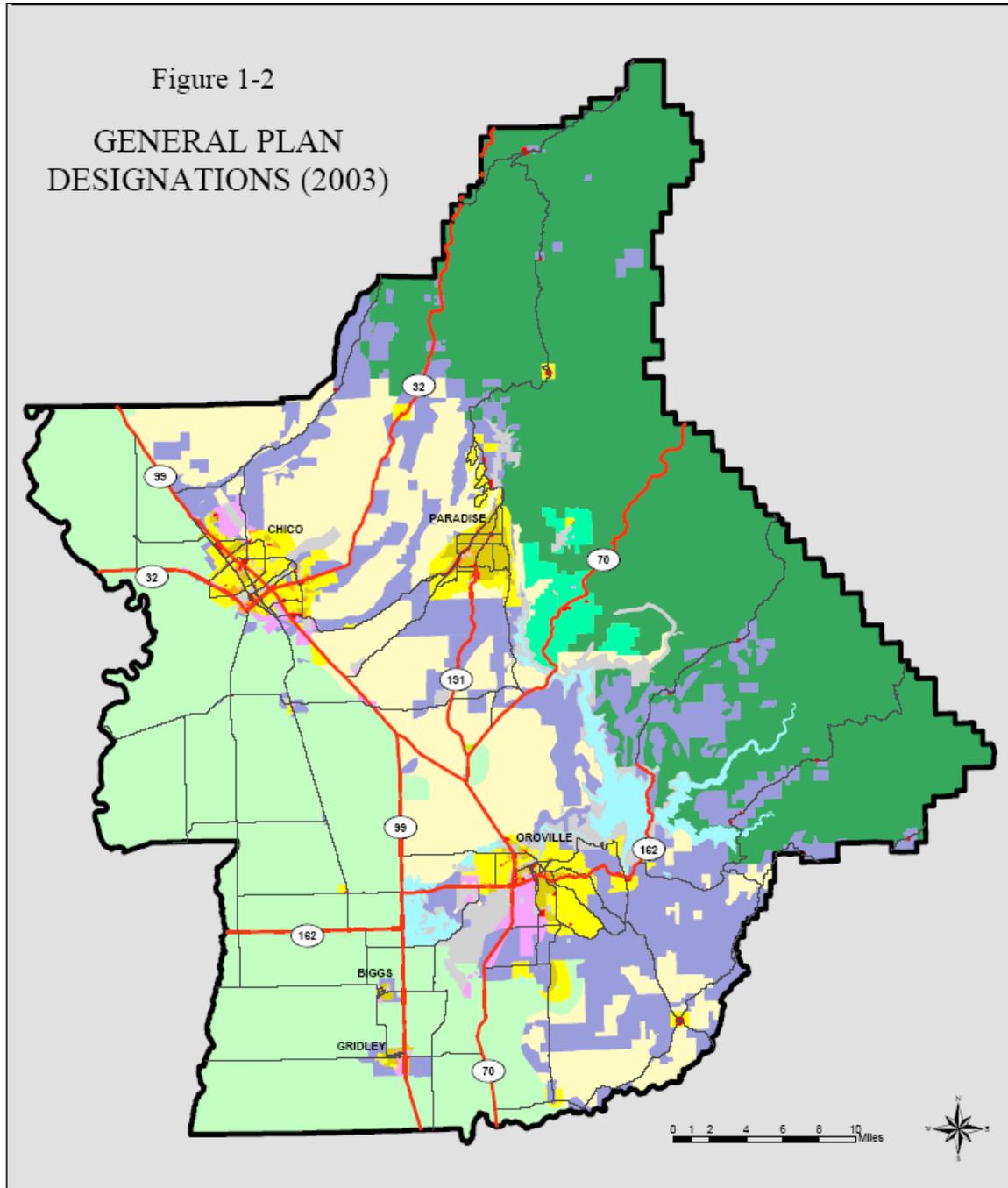
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The following map shows that most of the eastern third of the County is designated by the existing General Plan for Timber-Mountain uses, and most of the unincorporated areas in the central part of the County is designated a Grazing and Open Land. The western part of the County is designated as Orchard and Field Crops.

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**Butte County  
General Plan**



Date printed: June 24, 2003

**Legend**

TM - Timber Mountain 40 to 160 Acres/Dwelling Unit	AR - Agricultural Residential 1 to 40 Acres/Dwelling Unit	SE - Sports & Entertainment
GOL - Grazing & Open Land 40 to 160 Acres/Dwelling Unit	LDR - Low Density Residential Up to 6 Dwelling Units/Acre	C - Commercial
OFC - Orchard & Field Crops 5 to 40 Acres/Dwelling Unit	MDR - Medium Density Residential Up to 13 Dwelling Units/Acre	I - Industrial
FAR - Foothill Area Residential 1 to 40 Acres/Dwelling Unit	HDR - High density Residential Up to 20 Dwelling Units/Acre	P - Public
		Water

Source: Butte County Department of Development Services, 1996

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Each City within Butte County has adopted a land use and circulation plan for their incorporated lands and for their planning area. Development and land use changes are minimal throughout the County and within the cities of the County. However, as development and land use changes may be presented to the governing body of each jurisdiction, careful and thorough consideration is given to the potential impact by each hazard to the proposed development and or land use change. Approvals, as necessary and appropriate, may be conditioned with actions which mitigate the potential exposure to hazards. Following are the participating jurisdictions land use plans and maps.

**City of Biggs Area Land Use Plan**

The City of Biggs has developed a General Plan 1997 – 2015 which includes Land Use Goals, Policies, Programs, Plans and Designations. The City limit of Biggs encompasses an area of about 338 acres that is predominantly residential. By comparison, employment generating uses and vacant land available for development within the City are limited. The largest land use in Biggs is residential. Most of the housing consists of single-family dwellings. There are no mobile home parks in the City.

Commercial and industrial land uses in Biggs have experiencing a decline for a number of years due to larger retail stores in the surrounding cities drawing shoppers from Biggs. The industrial base in Biggs for many years has been rice processing and handling. The temporary closing of the only rice mill and storage facility within the City limits caused a serious loss of jobs and decline in electric utility revenues. The mill is now operated as a secondary mill when demands exceed the capacity of the mills leasers' primary location. The City is presently searching for ways to revitalize it commercial district and to rebuild or replace its lost industrial uses.



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**City of Chico Area Land Use Plan**

The Chico Planning Area consists of approximately 150 square miles of land located in the west central portion of Butte County. The existing Chico Area Land Use Plan establishes a “greenline,” generally around the western portion of Chico. The greenline constitutes the boundary between urban and agricultural uses on the western side of the Chico urban area. The County’s area plan states that all land use on the “agricultural side” of the greenline “shall consist solely of agricultural land uses as provided by the Orchard and Field Crops designation.” Agricultural Residential land uses are also permitted on the agricultural side of the greenline, where designated by the Chico Area Land Use Plan. The Plan further states that land uses on the urban side of the greenline “shall be guided by the policies of the Land Use Element and the applicable urban land use designation contained in the Land Use Element.”

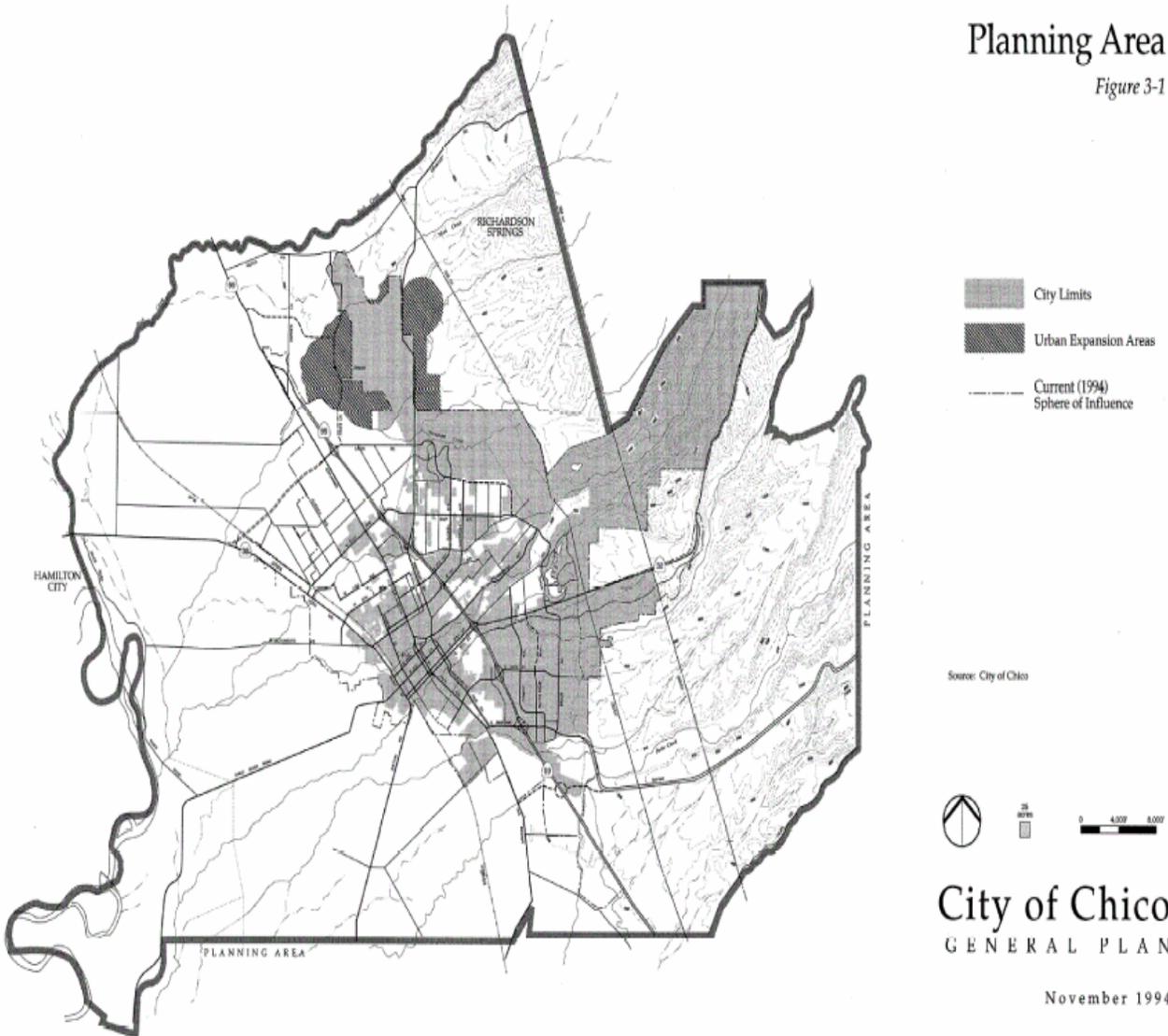
Butte County’s largest urban community, Chico, experienced a moderately slow and steady growth rate until 1960. The city grew rapidly during the 1960s and through the first half of the 1970s, largely due to increased student enrollment at California State University, Chico (CSUC). Additional growth during the period from 1970 to 1990 established the city as the retail, service, and medical center for the region. Chico is home to two regional malls and major discount retailers. Also, Chico is a major medical and education center servicing much of the entire northeastern part of California. The Planning Area includes all of the incorporated City of Chico and any land outside its boundaries which in the planning agency’s judgment bears relation to its planning.

The city also provides the most fully developed retail commercial area in the county. In the non-urban part of the area surrounding Chico, the predominant land use on the valley floor is agriculture, including a variety of crops. Prime agricultural soils are found on the valley floor on the west side of the city. Generally, soils to the east of the city are suitable only for seasonal grazing. In the foothill areas, the predominant uses are low-density housing, marginal agricultural activity, and recreation/open space.

Urban land uses with significant public and regional retail uses predominate the area. Existing policies seek to preserve agricultural land, centralize development, and steer new urban growth to the north, east, and southeast. Development constraints include agricultural lands and poor soils in the foothills area.

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**City of Gridley Area Land Use Plan**

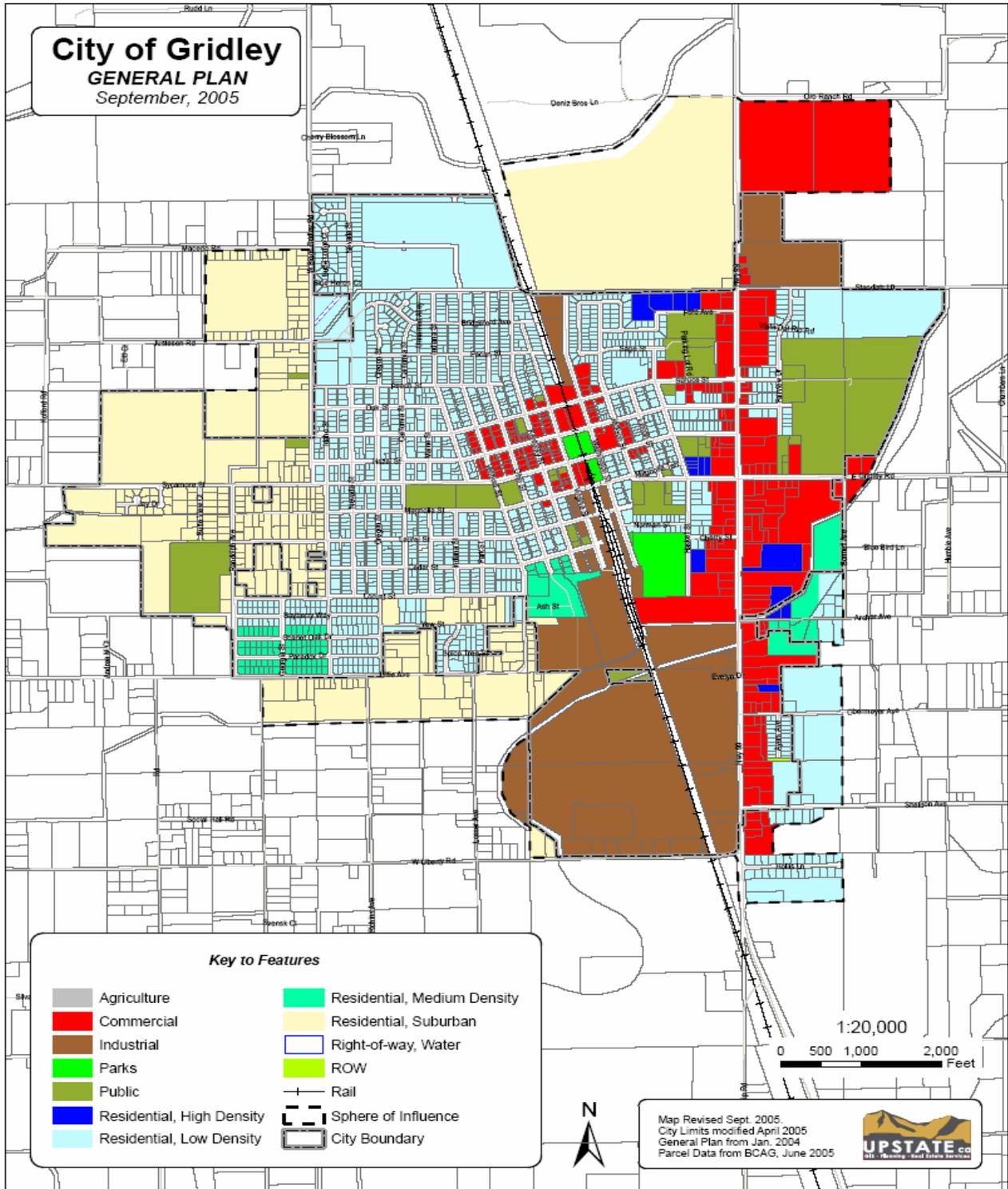
The City of Gridley encompasses an area of about 1,360 acres and is located in the southwest corner of Butte County, approximately five miles south of the City of Biggs. The City of Gridley General Plan consists of eight elements: Land Use, Circulation, Public Facilities, Open Space, Conservation, Housing, Noise, and Safety/Seismic Safety.

Substantial differences exist between the land use designations of the City and the County General Plans for the area within the City's primary sphere of influence. The main differences occur in the areas of land immediately south, east, and west of the current city limits. In general, the County land use designations would allow lower density residential development than would the City designations. Besides limitations by the County Agricultural Element, the Gridley Urban Reserve limits parcel sizes to five (5) acre minimum.

An Area of Concern (AOC) was adopted by the Butte County Local Agency Formation Commission between the City of Biggs and the City of Gridley. This is a designated area within the unincorporated land between the cities where LAFCO is required to notify both the Cities of Biggs and Gridley of County development projects. This area is to help coordinate growth and facilitate communications concerning development proposals in the area.

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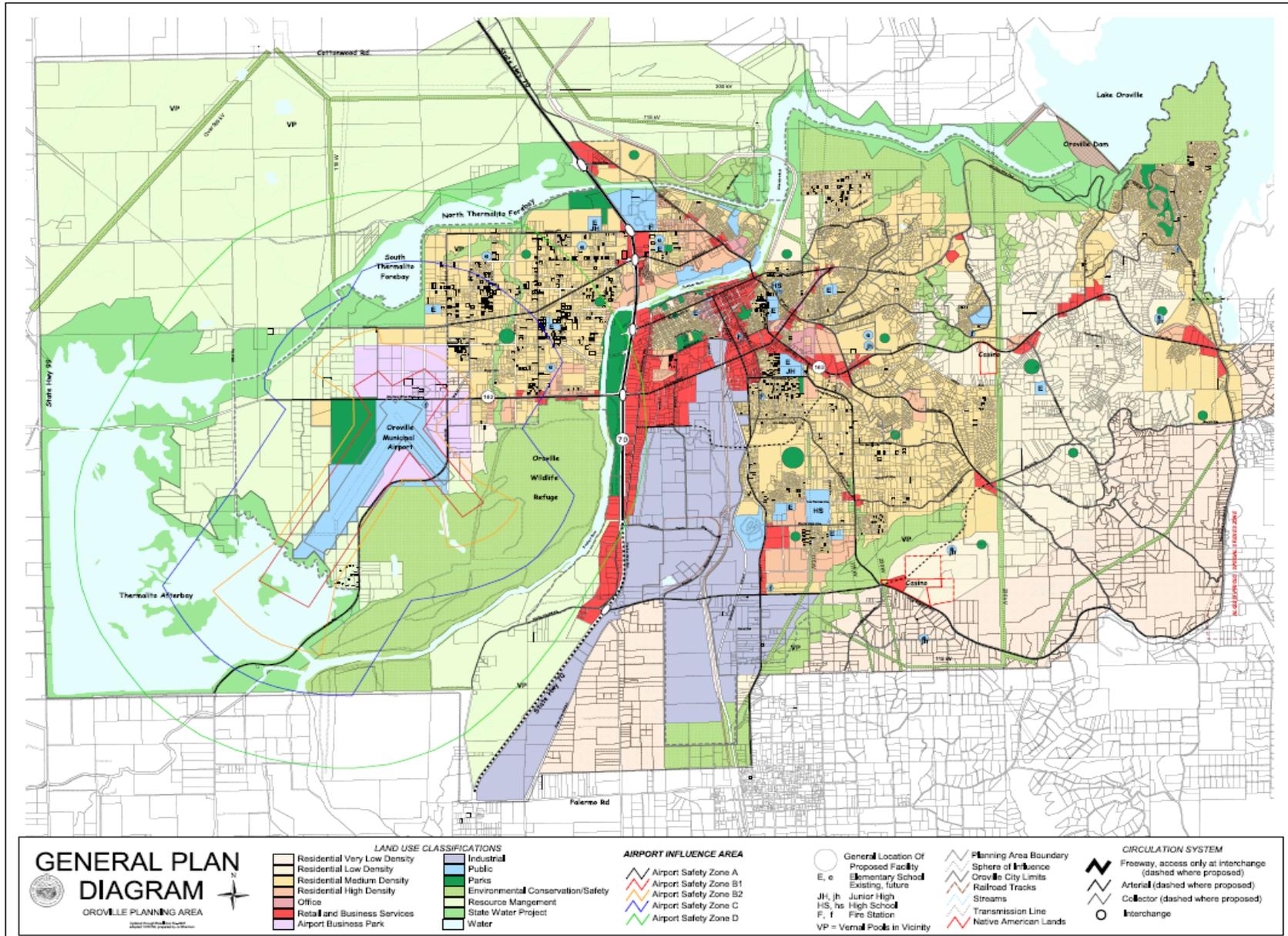
**City of Oroville Area Land Use Plan**

The existing Oroville Area Plan uses a 20-year time horizon and covers both the incorporated and unincorporated areas within the Oroville-Thermalito area. The Plan generally reflects the land use patterns and zoning in areas of existing development. Recognizing the sprawling and scattered growth patterns in the area, the Plan consolidates urban development in two general areas: the area in and around the City of Oroville and a smaller area in the eastern portion of the planning area along Kelly Ridge. The Plan also establishes an Urban Reserve policy within the approximately 2,000 acres of the area south and east of the Wyman Ravine.

The Oroville planning area occupies 38,700 acres. Land use ranges from rural residential in the foothills to intense commercial and industrial uses in and adjacent to Oroville. Public infrastructure available through several agencies has capacity to support future urban development.

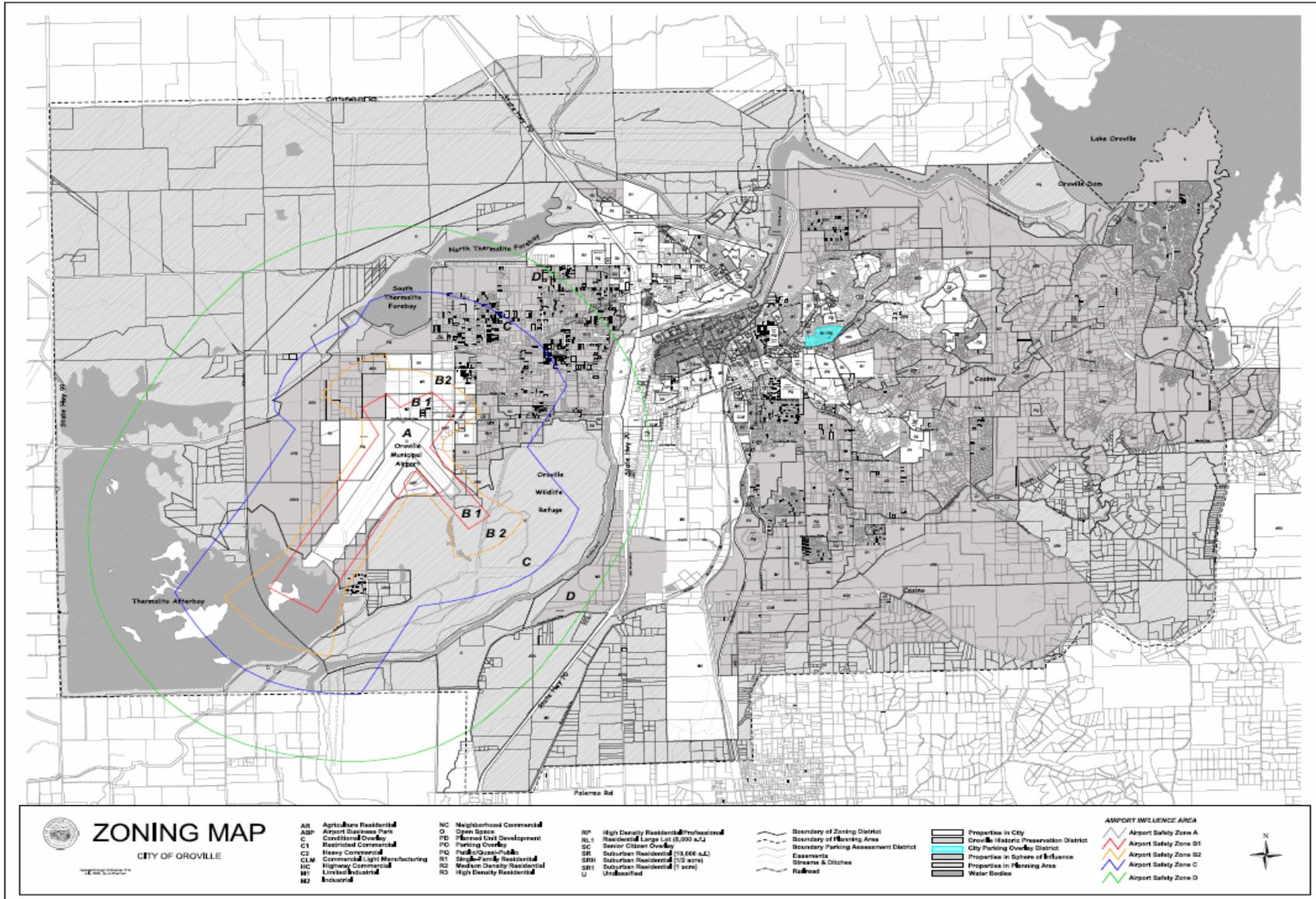
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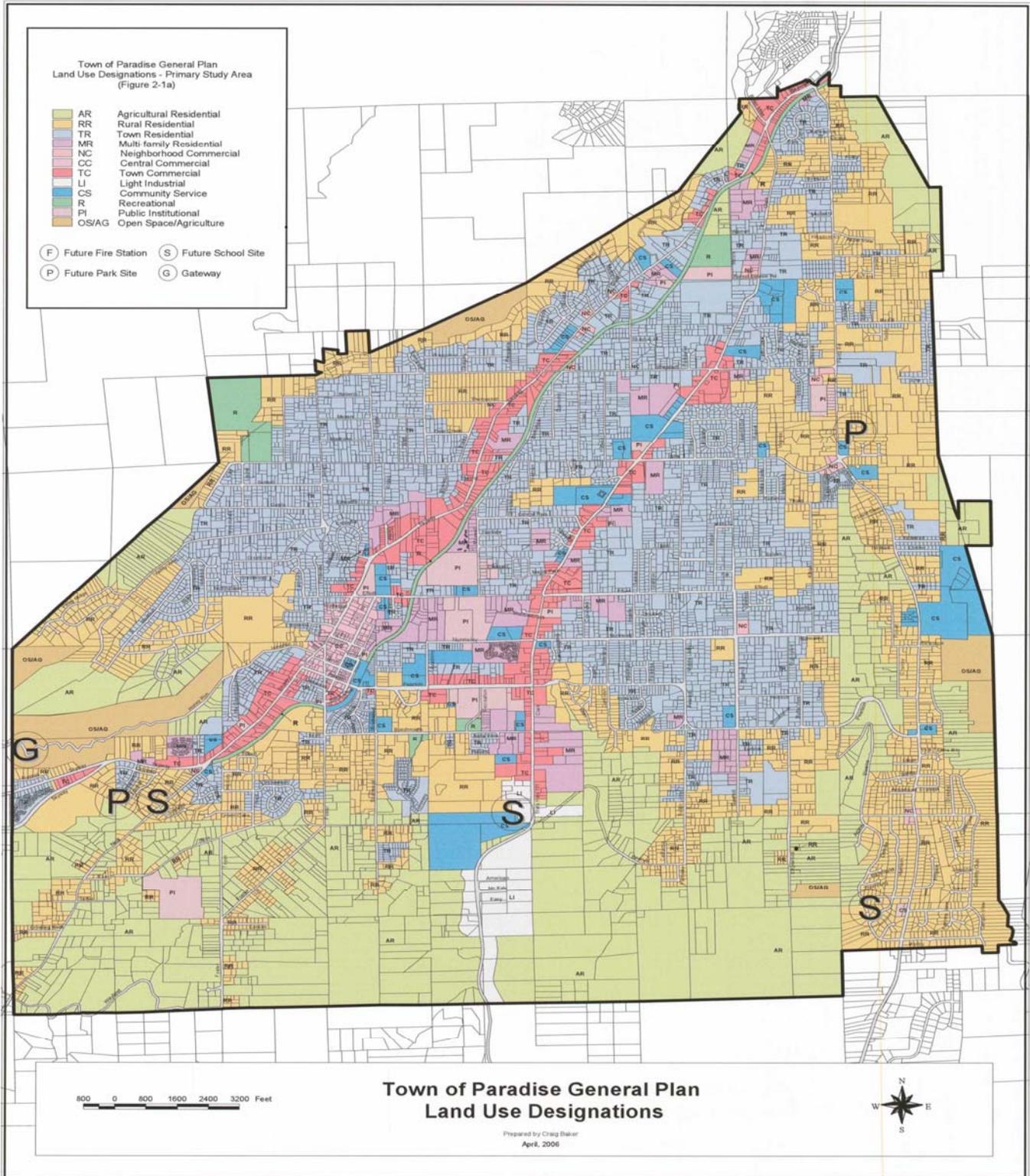
**Town of Paradise Urban Reserve Area Land Use Plan**

The Town of Paradise Urban Reserve Area Land Use Plan prescribes land use for the large unincorporated area called the Upper Ridge, and smaller unincorporated areas adjacent to the Town of Paradise on the Lower Ridge. The area plan designates approximately 1/3 of the Upper Ridge area Agricultural Residential; 1/3 Grazing and Open Lands; and the remainder Timber Mountain, Public, and Commercial.

The planning area occupies 14,700 acres. Paradise is the third largest incorporated community in the County. Land use is dominated by residential and commercial uses with a limited number of industrial activities. Constraints include a shortage of flat, developable land, poor soils for septic tank use, and potential water supply limitations.

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**Butte County Development Trends**

While the population of Butte County is expected to continue growing, there are Land Use policies and elements within the County General Plan to help assure orderly development. The County has begun a comprehensive update to its General Plan and zoning ordinance. The update process will evaluate future trends and establish updated policies relating to development. Part of the General Plan update process is to consider future growth rates. The Butte County Association of Governments (BCAG) serves as the regional transportation body in the County. BCAG has generated a preliminary growth projection analysis to be available for the County in its General Plan update process. These projections have not yet been adopted by the BCAG Board. Adjustments to these preliminary projections may also take place during the General Plan update process.

In addition, the Local Agency Formation Commission (LAFCO) of Butte County is tasked with the mission to provide an orderly pattern of growth that reconciles the varied needs of the County. Approval is required by LAFCO for properties that wish to be incorporated within City limits. One of the fundamental principles of LAFCO is to ensure the establishment of an appropriate and logical municipal government structure for the distribution of efficient and appropriate public services.

LAFCO Land Use Objectives include:

- the discouragement of urban sprawl;
- the preservation of the physical and economic integrity of agricultural lands;
- the preservation of open space within urban development patterns;
- the orderly formation and development of agencies by shaping local agency boundaries;
- the minimization of agencies providing services to a given area; and
- the utilization of Spheres of Influence to guide future development of agency boundaries.

**Agribusiness in Butte County**

Butte County has been, and continues to be, a predominantly rural, agricultural county. Two kinds of agricultural activity occur in the county: 1) cultivation of row and field crops (field, seed, vegetables), orchard and tree products (fruit and nut), nursery stock, and apiary (bee and honey); and 2) grazing/animal husbandry, a category which includes livestock ranching and all aspects of animal husbandry.

The Valley area, which consists of rich alluvial bottom lands of the Sacramento River Valley, is predominantly agricultural in character. Most of the intensive agriculture in the

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county occurs here, due to the availability of level topography, prime cultivable soils, and excellent drainage. In 2000, approximately 249,000 acres of county land were used for intensive agriculture, mainly to grow rice, almonds, prunes, and walnuts. An additional 265,000 acres were devoted to grazing lands. Numerous agricultural processing facilities are found throughout the Valley area.

Butte County welcomes and encourages the growth of agribusiness. Its commitment to working with the health and vitality of this industry strengthens California's number one status in agriculture in the United States.

Butte County's rich soil, temperate climate and abundant water supply help produce a variety of crops, valued at nearly \$360 million. The number of full-time farms increased by three percent between 1992 and 1997, while the market value of crop sales increased by 57 percent. Top crops include: rice, almonds, walnuts, prunes, peaches and kiwi fruit.

Almonds are a major crop in the Chico area and the city is bordered on the west by thousands of acres of almond trees. The trees bloom with a pink/white flower in late February or early March. Millions of bees are brought in for the pollination. The nuts are harvested in late August.

In the southern end of Butte County is the farm community of Gridley. Gridley is known as the kiwi fruit capital of the United States and is also home of the Butte County fairgrounds.

Butte County Agribusiness is diverse in its growth, attracting a range of companies from food processing and packaging to research and development. These companies have discovered the unbeatable mix of resources and incentives that enable them to deliver more variety and higher-quality products at lower operating costs.

Following is a five year (2000 to 2004) summary of crop values in Butte County.

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**Five-Year Summary  
Of Crop Values**

<b>Crops</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>
Field	\$127,540,000	\$106,642,000	\$112,987,000	\$124,279,000	\$112,402,000
Seed	7,552,000	5,755,000	\$6,877,000	\$7,459,000	\$8,080,000
Vegetable	570,000	505,000	\$490,000	\$510,000	\$550,000
Fruit and Nuts	138,634,000	121,991,000	\$149,687,000	\$175,611,000	\$196,487,000
Nursery Stock	5,961,000	8,555,000	\$7,178,000	\$11,985,000	\$10,786,000
Apiary Products	2,515,000	2,377,000	\$2,260,000	\$2,624,000	\$2,578,000
Livestock, all	8,573,000	8,800,000	\$8,018,000	\$9,678,000	\$12,359,000
Subtotal	\$291,345,000	\$254,625,000	\$287,497,000	\$332,146,000	\$343,242,000
Timber	33,484,000	32,878,000	\$18,056,000	\$13,264,000	\$15,032,000
Grand Total	\$324,829,000	\$287,503,000	\$305,553,000	\$345,410,000	\$358,274,000

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#### **4. Hazards Facing Butte County and the Participating Jurisdictions**

##### **Identification of Hazards**

With its varying topography; mix of urban and rural areas; rapidly growing permanent, transient, and recreational populations, Butte County and the participating jurisdictions is subject to potential negative impacts from a broad range of hazards and threats. There are three broad categories of hazards that threaten the County, namely:

- Natural hazards
- Technological hazards
- Domestic security threats

Natural hazards include:

- Wildfires
- Floods
- Earthquake
- Landslide
- Extreme Weather (drought/heavy rain/hailstorm/windstorm/tornado)
- Volcano
- Insect Infestation
- Naturally Occurring Biological Threats

Technological hazards include:

- Dam Failure
- Hazardous Materials (Hazmat) Incidents

Domestic security threats include:

- Terrorism (CBRNE)
  - Chemical
  - Biological
  - Radiological
  - Nuclear
  - Explosive

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The following table describes how and why the hazards listed above were identified by Butte County in preparing its MHMP.

<b>Hazard</b>	<b>How and Why Identified</b>
Wildfire	History of events
Flooding	History of events
Earthquake	History of events; presence of fault lines and geologic activity
Landslide	History of events
Extreme Weather	History of events
Dam Failure	History of events; presence of dams
Volcano	History of events
Hazardous Materials (Hazmat) Incidents	History of events
Insect Infestation	History of events
Naturally Occurring Biological Threats	History of events
Terrorism	Heightened sense of awareness since September 2001

For the rating of “**probability**” of occurrence, for each of the following hazards, the participants in the workshop for the Butte County MHMP were asked to provide ratings of the likelihood that an event would occur in the future. The ratings that were used were:

- High Probability (highly likely to occur)
- Medium Probability (likely to occur)
- Low Probability (not very likely to occur)

These were subjective, order-of-magnitude ratings that participants could relate to whether they were highly skilled in a hazards area (e.g., members of a fire department) or not. This approach facilitated utilizing a consensus approach with the participating group.

For the rating of “**severity**”, the participants in the workshop for the Butte County MHMP were asked to provide ratings of the likely severity of an event, assuming one occurred in the future. The ratings that were used were:

- High Severity (extensive loss of life and/or property)
- Medium Probability (moderate loss of life and/or property)
- Low Probability (relatively modest loss of life and/or property)

These were subjective, order-of-magnitude ratings that participants could relate to whether they were highly skilled in a hazards area (e.g., members of a fire department) or not. This approach facilitated utilizing a consensus approach with the participating group.

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**Hazard: Wildfire**

**Jurisdictions Affected by Wildfire**

<b>Butte County Probability: Very High</b>	<b>Butte County Severity: High</b>
<b>Biggs Probability: Low</b>	<b>Biggs Severity: Low</b>
<b>Chico Probability: Medium</b>	<b>Chico Severity: Medium</b>
<b>Gridley Probability: Low</b>	<b>Gridley Severity: Low</b>
<b>Oroville Probability: Very High</b>	<b>Oroville Severity: High</b>
<b>Paradise Probability: Very High</b>	<b>Paradise Severity: Very High</b>

**Hazard Definition**

A wildfire is an uncontrolled fire spreading through vegetative fuels, posing danger and destruction to life and property. Wildfires can occur in undeveloped areas and spread to urban areas where structures and other human development are more concentrated.

To describe an area where urban development has been located in proximity to open space, or “wildland” areas, the term “urban-wildland interface” is commonly used. The most common type of urban wildland interface results when development occurs immediately adjacent to wildland vegetation. Other interface conditions can be created when urban development is intermixed with wildland vegetation, or when pockets of wildland vegetation occur inside developed areas.

The foothill communities of Kelly Ridge, Bangor, Cohasset, Forest Ranch, Paradise Pines, Concow, Yankee Hill, Berry Creek, and Forbestown are examples of intermixed urban-wildland interface areas. The communities of Paradise and Paradise Pines (Magalia) are more characteristic of interface communities where urban or suburban development immediately abuts the wildland. Fires that occur within the urban-wildland interface areas affect natural resources as well as life and property. This type of fire is

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described as “a fire moving from a wildland environment, consuming vegetation for fuel, to an environment where structures and buildings are fueling the fire”.

**Wildfire History**

Wildland fire hazards (open space, rangeland, chaparral, and forested areas) exist in varying degrees over approximately 70% of Butte County. Butte County has an extensive history of large damaging fires, most of which have burned within the urban interface area resulting in not only the loss of property but life. During the past decade, Butte County has experienced several large and damaging wildfires in and around the wildland urban interface areas. In 2000 and 2001, three fires in the Yankee Hill area burned close to 12,000 acres, destroyed 65 residences, numerous outbuildings and vehicles, and resulted in two civilian fatalities.

A summary of notable wildfires that have occurred in Butte County since 1992 is provided in the table below. This table does not list the numerous smaller fires that have occurred throughout the County.

<b>LARGE FIRES IN BUTTE COUNTY SINCE 1992</b>			
<b>Year</b>	<b>Fire Name/ Community</b>	<b>Acreage Burned</b>	<b>Residences/Structures Destroyed/Fatalities</b>
1992	Dry/Pentz	700	No
1992	Cox/Palermo	700	No
1992	Maidu/Centerville	675	Yes
1992	Burton/Lower Paradise	6,000	No
1992	Villa/Palermo	6,700	Yes
1993	Campbell/West Oroville	693	No
1994	Raulson/Yankee Hill	900	Yes
1994	Table/Oroville	960	No
1995	Hwy 149/Central Butte	2,000	No
1996	Palermo/Palermo	1,200	No
1997	Hwy 149/Central Butte	594	No
1999	Butte Complex/ Countywide	33,924	3 residences/11 outbuildings/1 civilian fatality. Dry lightning was responsible for nine separate large fires with the largest fire burning over 16,000 acres. Strong southwest winds ranging between 20 to 40 mph as well as hot temperatures, steep terrain and narrow access roads hampered the control process. Fire fighting cost exceeded \$11 million.
1999	Oregon Incident/ Oroville	200	The Oregon Incident was a civilian caused fire, but was aided by strong and gusty winds, low humidity, and inaccessibility. The fire was responsible for burning over 200 acres as well as destroying

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<b>LARGE FIRES IN BUTTE COUNTY SINCE 1992</b>			
			several homes and outbuildings. Fire suppression costs totaled \$20,000. Property damage over \$480,000. Five injuries were reported.
2000	Concow/Yankee Hill	1,835	A wildfire ignited east of Chico and was pushed by strong winds. High temperatures and low humidity assisted the rapid spread which led to some evacuations and structures lost. Damages to 14 residences, 1 civilian fatality, and firefighters burned over.
2001	Honey Run Fire	3.5	This fire started in the early morning hours. While only 3.5 acres in size, it posed an immediate threat to residents in lower Paradise and resulted in evacuations.
2001	Poe/Yankee Hill	8,333	This fire burned through the community of Yankee Hill and posed a potential threat to the Town of Paradise. Damages to 51 residences, 120 outbuilding , and 155 vehicles.
2001	Hwy 70/Yankee Hill	1,710	Fire threatened areas in the community of Yankee Hill that had escaped the Poe Fire less than two months earlier. Damage to commercial timber loss.
2002	Skyway	2,010	Structures threatened
2004	Oregon	2,030	1 residence destroyed/additional structures threatened

Source: California Department of Forestry and Fire Protection Butte County Community Wildfire Protection Plan; NOAA National Climatic Data Center; U.S. Department of Commerce

The following communities in Butte County are listed on the National Registry as fire threatened communities. An **F** in the Federal Threat column indicates some or all of the wildland fire threat to that community comes from federal (e.g., US Forest Service, BLM, Dept. of Defense, etc.) lands.

The Hazard Level code indicates the fire threat level, where **2** denotes moderate threat, and **3** denotes high threat.

<b>Fire Threatened Communities In Butte County</b>		
<b>Community Name</b>	<b>Federal Threat</b>	<b>Hazard Level</b>
Bangor		3
Berry Creek	F	3
Butte Creek	F	3
Butte Meadows	F	3
Centerville	F	3
Cherokee	F	3
Chico	F	3
Cohasset	F	3
Concow	F	3

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<b>Fire Threatened Communities In Butte County</b>		
<b>Community Name</b>	<b>Federal Threat</b>	<b>Hazard Level</b>
Feather Falls	F	3
Forest Ranch	F	3
Inskip	F	2
Jonesville	F	3
Magalia	F	3
Oroville	F	3
Oroville East	F	3
Palermo	F	3
Paradise	F	3
Pentz	F	3
Robinson Mills	F	3
South Oroville	F	3
Stirling City	F	3
Thermalito		3

Source: California Department of Forestry and Fire Protection; Butte County Community Wildfire Protection Plan

There are an additional 29 communities in Butte County recommended to be placed on the National Registry. The following table lists the Butte County communities recommended but not currently listed.

<b>Community</b>	<b>Estimated Population</b>	<b>Estimated Area (sq. mi.)</b>	<b>Density (Population/sq. mi.)</b>
Sunnyslope	20	.50	40
Brush Creek	30	2.00	15
Helltown	20	1.00	20
Oregon City	50	3.00	20
Doe Mill	100	3.00	30
DeSabra	750	3.00	225
Toadtown	20	0.50	40
Love Lock	20	0.50	40
Wyandotte	500	2.00	250
Kelly Ridge	3000	3.00	1000
Nelson Bar	20	0.50	40
Hurleton	200	1.00	20
Clipper Mills	100	2.00	50
Forbestown	100	2.00	50
Old Forbestown	30	0.50	60
Swedes Flat	50	0.50	100
Dunstone	50	0.50	100

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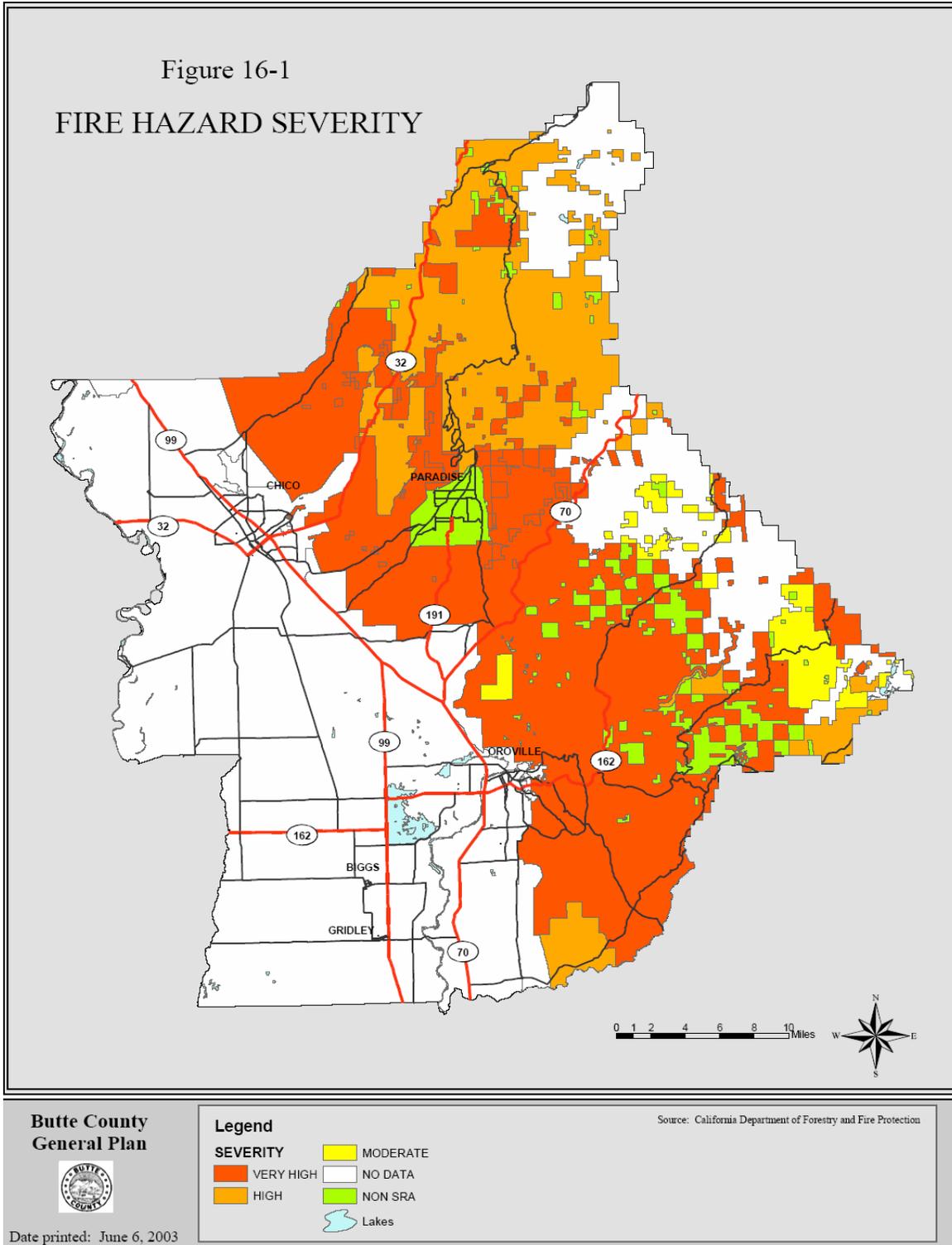
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<b>Community</b>	<b>Estimated Population</b>	<b>Estimated Area (sq. mi.)</b>	<b>Density (Population/sq. mi.)</b>
Robinson Corner	30	0.50	60
Honcut	50	1.00	50
Craig	20	0.50	40
Yankee Hill	2000	3.00	650
Big Bend	300	0.50	600
Deadwood	200	0.50	400
Philbrook	20	2.00	10
Butte Creek House	5	.25	20
Lomo	5	.25	20
Richardson Springs	100	.50	200
Woodleaf	10	.50	20

The following map depicts Butte County Fire Hazard Severity levels.

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**Risk Assessment**

Fire is a continuous threat in Butte County. The public is exposed to fire-related hazards from two potential sources: structural fires and wildland fires affecting urban and rural residential interface areas. Structures in the urban and rural interface areas are at risk of fires from wildland areas as well as those starting from inside the structures. Such fires can, in turn, spread to wildlands or other structures, causing additional needs for fire fighting resources. Butte County has an extensive history of large and damaging fires, most of which have burned within the urban interface area resulting in not only the loss of property but life.

The most likely fire threat within Biggs would be a structural fire within a residence or small business. Additionally, four other types of fires have the potential for resulting in major losses in and around the City. These include: fire or explosion at one of the local agricultural processing plants; major operational failure of the rail service which passes through Biggs; urban conflagration (multiple simultaneous structural fires); and, wildland and vegetation fire on the perimeter of the City of Biggs affecting agricultural crops.

Within the City of Chico Bidwell Park and the surrounding land along with the foothills in the eastern Planning Area are the areas most prone to wildland fires.

The Town of Paradise has experienced numerous wildland fires over the years. While none have resulted in the devastation of major fires such as the Oakland Hills Fire in 1991, the threat and possibility of such a fire is very real. The impact of a wildland fire on the watersheds surrounding the Town could also be significant.

The fire hazard severity assigned to state responsibility lands (SRA) under the protection of the California Department of Forestry and Fire Protection are measures of expected fire behavior given the topography and vegetative fuels. Based on these parameters, the fire hazard severity is determined to be very high, high, or moderate. Population density and the number of structures in a given area are not determinants of an area's fire hazard severity. The actions of humans also influence the risk of wildfires. These four factors in Butte County: weather, fuel, topography and human actions, are described below.

**Weather.** The climate in Butte County is generally referred to as "Mediterranean" with hot dry summers and relatively cool, moderately wet winters. Rainfall throughout the County occurs primarily between October and April, and ranges between 75+ inches per year in the foothill/mountain areas, to less than 18 inches per year in the valley areas. Because the summer months are generally hot and dry, the risk of wildfires is greatest in late summer and early fall. Compounding the severity of fire conditions are north to northeast winds, as well as low relative humidity in the summer and fall. The community

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of Yankee Hill/Concow is especially affected by northeast winds, because the north fork drainage of the Feather River enhances those winds.

Similar weather-related elements have complex important effects on wildfire intensity and behavior. Wind is a primary weather factor that influences fire behavior – as wind velocity increases, the rate of fire spread, intensity and spotting potential also increase. Gusty and erratic wind conditions can cause a fire to spread irregularly, making it difficult to predict its path and effectively deploy fire suppression forces. Relative humidity is also an important fire-related weather factor. As humidity levels drop, the dry air causes vegetation moisture levels to decrease, thereby increasing the likelihood that plant material will readily ignite and burn and increasing spot fire potential.

**Fuel.** A large portion of Butte County is covered by natural vegetation. Fuels have been classified as grasses, brush and timber. This vegetation can be further defined into 13 fuel model types, each of whose characteristics contributes to varying degrees to fire behavior. The likely fire behavior can be influenced by many factors, including the age of vegetation, the amount of accumulated dead plant material, and the period of time since a stand of vegetation was last burned. The most significant fire hazard severity is posed by communities of mature chaparral and overstocked stands of mixed conifer with a heavy component of ground and ladder fuels. This type of vegetation burns with intense heat and high flame, because the amount of fuel readily available to burn can be very high if the area has not been properly managed or has not recently burned. Controlled burning is one method that can greatly reduce the fuel loading and hence fire behavior potential for a given area. Other fuel conditions in addition to fuel loading that can significantly affect fire behavior include an abundance of dead fuel, live and dead fuel moistures, fuel arrangement, and in developed areas the addition of some types of ornamental vegetation.

**Topography.** Steep terrain or slope plays a key role in the rate and direction in which wildfires spread; as fires will normally burn much faster uphill. Generally, when the gradient of a slope doubles, the rate of spread of a fire will also double. Steep, rugged topography also channels air-flow, thereby creating erratic wind patterns. Fire suppression in steep areas is complicated by limited accessibility, and the effectiveness of firefighters and equipment are hampered by terrain and the lack of access roads. Equipment may be unable to work at all on steep terrain

**Human Actions.** Most wildfires are ignited by human action, the result of direct acts of arson, carelessness, or accidents. Many fires originate in populated areas along roads and around homes, and are often the result of arson or careless acts such as the disposal of cigarettes, use of equipment or debris burning. Recreation areas that are located in high fire hazard areas also result in increased human activity that can increase the potential for wildfires to occur.

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- **Effects on people and structures.** As the previous table of selected historic wildfire incidents shows, the effects on people and housing can be significant. In addition to damaging natural environments, wildfires injure and kill residents and firefighters, as well as damage or destroy structures and personal property. Many of the fires shown in the table resulted in the evacuation of homes. In 2000 and 2001, three fires in the Yankee Hill area burned close to 12,000 acres, destroyed 65 residences, 131 outbuildings, 155 vehicles, and resulted in civilian fatalities.
- **Effects on infrastructure.** In addition to damaging residences and structures and injuring and killing residents and firefighters, wildfires also deplete water reserves, down power lines, disrupt telephone service, and block roads. They can also indirectly cause floods, if flood control facilities are inadequate to handle an increase in storm runoff, sediment, and debris that is likely to be generated from barren, burned-over hillsides.

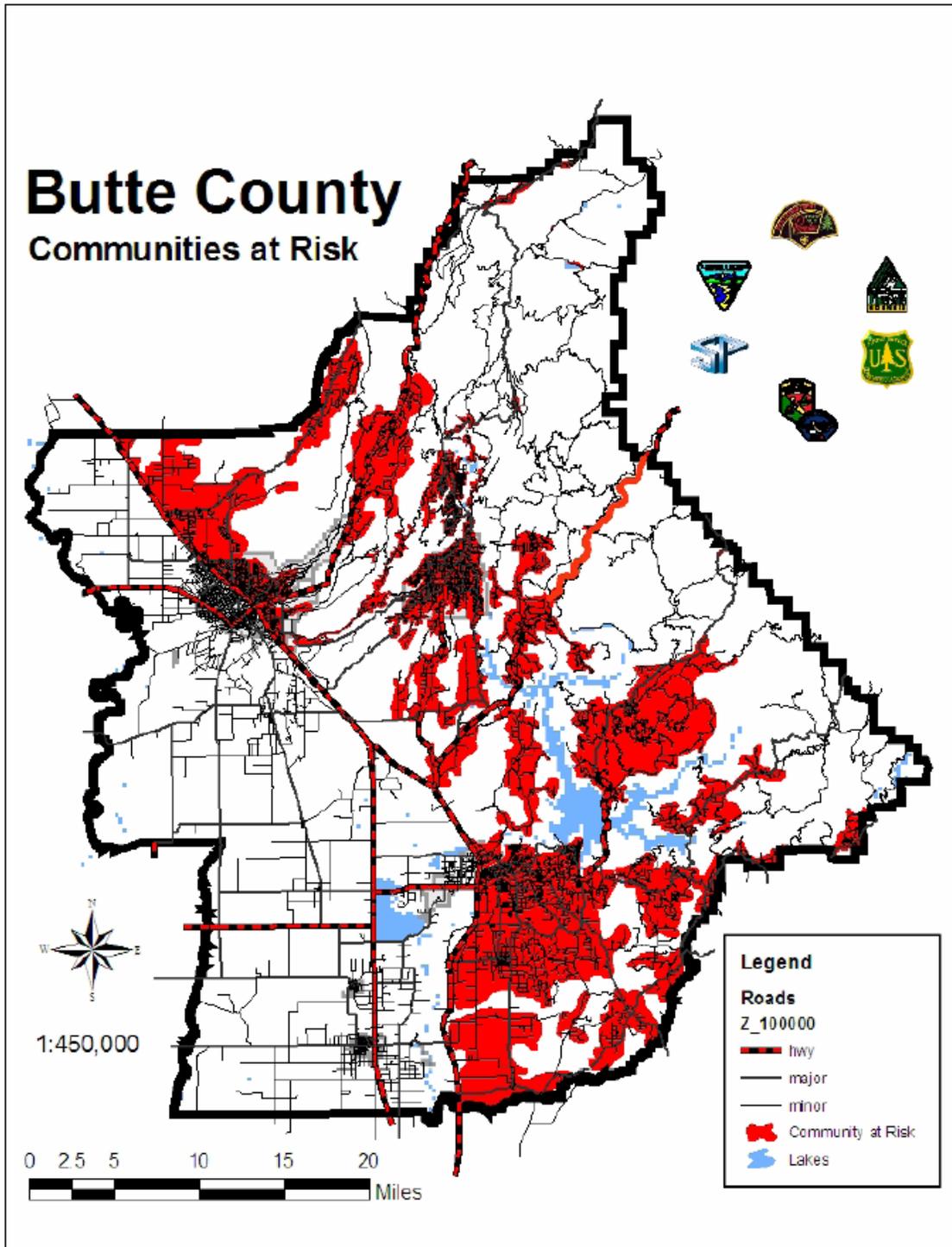
**Risk assessment conclusion.** Wildfire will continue to be a high risk hazard for Butte County. The potential for loss of life and property from urban structure fires is greatest in places where large groups of people gather, such as offices, stores, hotels, and theaters. Uses which may suffer large monetary losses due to a major fire include businesses, factories, and shopping areas.

The following maps depict Butte County Communities at Risk. The Butte County Fire Safe Council Community Wildfire Protection Plan committee developed the maps designating Butte Counties Communities at Risk and surrounding Wildland Urban Interface (WUI) areas. The Communities at Risk were mapped with GIS technology using parcel, site address, population density (2000 census), aerial photography, and road data along with local knowledge. The communities were designated because they contained residential structures, varying from a cluster of homes to thousands of structures with infrastructure.

The second map designates the Communities at Risk with surrounding WUI areas. The WUI areas were broken down in two parts, the Adjacent WUI which is the area immediately surrounding the community at risk extending out ½ mile, and the Extended WUI consisting of the area surrounding the Adjacent WUI extending out an additional 1 mile; the total WUI area is 1 ½ miles around the Community at Risk.

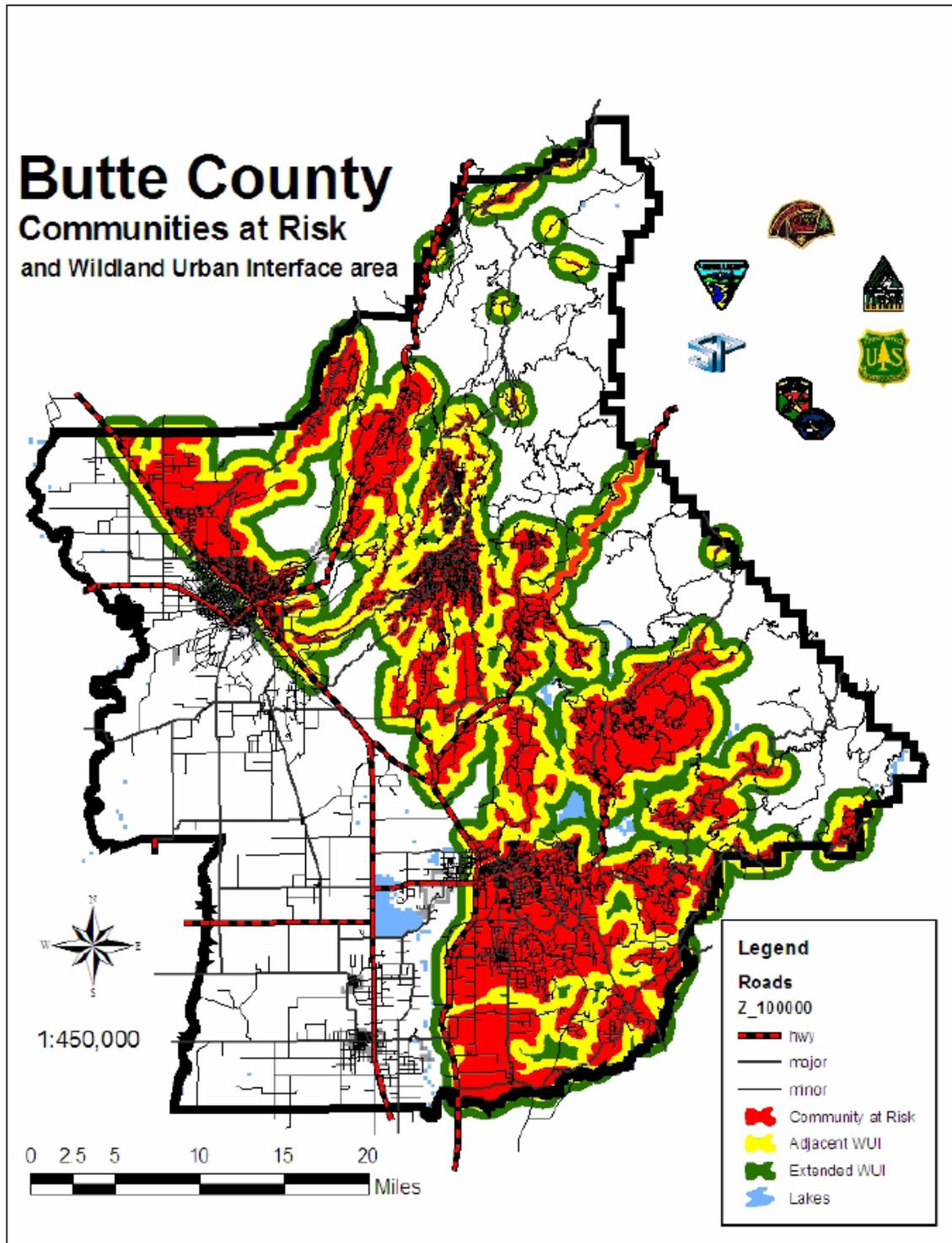
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**Relationship to Other Hazards – Cascading Effects**

**Flooding and erosion.** Major wildfires can completely destroy ground cover. If heavy rains follow a major fire, flash floods, heavy erosion, landslides and mudflows can occur. These cascading effects can have ruinous impacts on people, structures, infrastructure, and agriculture.

**Plans and Programs**

The responsibility for the prevention and suppression of wildfires in Butte County belongs to the California Department of Forestry and Fire Protection (CDF), the Butte County Fire Department (BCFD) and to individual cities within their incorporated areas.

As the major fire fighting force in the County, CDF/BCFD maintains 48 fire stations and support facilities either fully or cooperatively. The CDF/BCFD also maintain a fleet of fire fighting equipment in Butte County, including engines, aircraft, squads/rescues, bulldozers, water tenders, hazardous materials units and heavy rescue vehicles.

The CDF and the United States Forest Service have entered into automatic aid agreements for the purpose of wildfire protection in Butte County. The Bureau of Land Management contracts with CDF to protect its lands within Butte County. Automatic aid agreements are reciprocal arrangements in which fire protection agencies share personnel and equipment during emergency situations. The cities of Biggs, Chico, Gridley, Oroville and the Town of Paradise are all signatories to automatic aid agreements with both CDF and BCFD. CDF/Butte County Fire Department provides fire protection under contract to the cities of Biggs and Gridley.

To minimize potential fire risks, a variety of legislative and advisory programs have been developed. Local ordinances direct fire prevention activities within Butte County. These include, 1) Improvement Standards for Subdivisions, Parcel Maps and Site Improvements Pursuant to Chapter 20 of the Butte County Code; 2) Chapter 38 and 38A of the Butte County Code covering Fireworks and Weed Abatement, 3) The Fire Safe Regulations of Public Resources Code 4290 and Public Resource Code 4291.

**Mitigation Goals and Strategies**

**Butte County**

Butte County Mitigation strategies are prioritized by zone, with the highest priority being the home ignition zone and working outward to the Extended Wildland Urban Interface (WUI). There are numerous factors which contribute to homes and communities being at risk to loss from wildfires, including building construction features and hazardous fuel

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conditions. Many factors are under the control of the resident, property owner, community, or County.

The Butte County Community Wildfire Protection Plan of 2005 includes the following mitigation Goals and Strategies.

**Fire Risk and Mitigation Strategies Areas of Focus:**

- A. Information, Education and Planning
- B. Reducing Structure Ignitability
- C. Enhancing Suppression Capabilities and Public Safety
  - 1. Fire Protection
  - 2. Access and Signage
  - 3. Water Systems
- D. Hazardous Fuel Reduction Planning & Implementation

**Mitigation Strategies Prioritization by Zone:**

- 1. Home Ignition Zone – The home and landscaping out 100 feet.
- 2. Community at Risk Zone
- 3. Adjacent Wildland Urban Interface (WUI) Zone – 1/2 mile around Community
- 4. Extended Wildland Urban Interface (WUI) Zone- 1 mile around adjacent WUI.

**A. Information, Education and Planning:**

The Butte County residents and communities have benefited from the fire safe activities of fire safe councils within Butte County, local fire departments, state and federal agencies, and private organizations. Some examples are:

- Countywide chipper program
- Evacuation planning
- Education information
- School and Adult Education Programs
- Hazardous fuel reduction projects
- Homeowner consultations
- Special needs assistance program
- Fire Safe Council website
- Homeowner Guides to Firewise Landscaping
- Wildfire safety information and community meetings

**B. Reducing Structure Ignitability**

Structures and Attachments. Strengthen building standards and compliance for new construction and building remodel activities, and provide incentives for existing

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residences and properties to make them less prone to loss from a wildfire due to embers, radiated heat, or surface fire spread.

- Roofing (Shake roofs are a leading cause of home loss in wildfires)
  - Educate residents on importance of replacing wood shake roofs
  - Modify County and City Codes to 1) limit the amount (%) of a home's unrated roof that can be replaced; 2) reduced or no fee permits for replacement of shake roofs; 3) replacement of shake roofs upon sale of a home; 4) establish a sunset clause on unrated roofing material; 5) develop a financial incentive program within the County to assist qualifying residents with the replacement of their Class C and unrated roofs.
- Siding (untreated wood siding significantly adds to the radiant heat and firebrand exposure risk from wildfire)
  - Educate residents on importance of replacing wood siding
  - Modify County and City Codes to 1) limit the amount (%) of a home's unrated siding that can be replaced; 2) reduced or no fee permits for replacement of wood siding; 3) replacement of wood siding upon sale of a home; 4) establish a sunset clause on unrated siding; 5) new construction standards for siding – consider standards for fire resistive siding on new constructions required to be permitted.
- Vent Openings
  - Educate residents and the building industry on the importance of steel vent screening:
    - Explore incentives for screening
    - Modify County and City Code Measures which may include, but not be limited to, requiring steel screening of vent openings upon home sale or remodel
- Eaves (eaves often add to the home's exposure from wildfire by trapping direct flames and embers).
  - Educate residents and contractors of the importance of fire resistive eave construction
  - Explore incentives for improvements to eave construction
  - Modify County and City Code measures which may include, but not be limited to, boxed-in eaves upon home sale
- Decks
  - Educate residents on the importance of fire safe decking
  - Modify County and City Code Measures which may include, but not be limited to, prohibiting unsafe synthetic decking
  - In the interim period, modify County and City Codes to meet the new Wildland-Urban Interface Fire Areas Building Standards for new construction

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- Detached Structures
  - Educate residents on need for separation of detached structure and flammable heat sources
  - Enforce clearance requirements on detached structures
- Woodpiles
  - Educate residents on the need to separate wood piles from their residence
  - Modify County and City Codes to require fire resistive wood sheds
- Propane tanks
  - Educate residents on the need for separation between their home and propane tanks

**C. Enhancing Suppression Capacities and Public Safety**

- Fire Protection
  - Automatic Aid Agreements
  - Cooperative Countywide emergency service planning
  - Support the implementation of the Butte County Fire Rescue Master Plan developed by the County Fire Chiefs Association
- Road and Address Signage
  - Explore incentives for fire safe house signing
  - Consider modifying County and City Codes Measures which may include, but not be limited to, requiring proper signage upon sale
  - Enforce road and address signage requirements for all new construction
- Driveways and Private Roads
  - During the General Plan revision process evaluate and develop County standards for private road construction and maintenance
  - Educate residents on the need to build and maintain private roads suitable for emergency access
  - Develop and enforce standards for private roads
  - Explore incentives for homeowners to bring existing driveways up to compliance with state and local standards for emergency access
  - Enforce state and local driveway standards for emergency access during new construction
- Gates
  - Modify County and City Codes to require all gates comply with state and local standards for emergency access
  - Explore incentives for fire safe gates
  - Enforce state and local gate standards for emergency access during new construction
- Vegetative Clearances
  - Enforce vegetative clearance standards

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- Modify County and City Codes to require existing, non compliant roadways and driveways to conform to current vegetation clearances standards when receiving any new building permit
- Slopes, turnouts and turnarounds, bridges (driveway and private roads)
  - Require that driveways and roadways meet the fire safe standards for slopes, turnouts and turnarounds, and bridges need to have the capacity to accommodate emergency vehicles in terms of width, height and weight
- Access for evacuations in and out of the community in the wildland urban interface.
  - Agencies working with County OES will identify communities with inadequate escape routes. This process shall be included in the County General Plan process
  - Develop alternate community escape routes
  - Support efforts to improve local and state road systems for emergency access
- Water Systems.
  - Individual structures and property
    - Identify, sign and map, using GIS, existing water sources
    - Explore incentives for property owners to enhance water storage and delivery for fire protection
  - Existing Communities and Subdivisions
    - Identify, sign and map, using GIS, existing water sources
      - Enhance storage and delivery of water
      - Explore incentives for enhancing water storage and delivery
      - Explore options to increase community storage and delivery
  - Proposed Residential and Commercial Developments
    - Ensure that proposed residential and commercial developments comply with the state and local standards for emergency water systems
  - Enhance storage of water within the Wildland Urban Interface Area
    - Communities and local agencies should work collaboratively at the local, state, and federal level to identify opportunities to improve water storage, access and development for firefighting on public and private lands

**D. Hazardous Fuel Reduction**

- Defensible space and fuel treatment on developed lots
  - Educate residents on the need for creating and maintaining defensible space
  - Explore incentives to increase compliance with state and local laws

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- Developing a process to aid state and local agencies in enforcing defensible space laws
- Fuel treatment on adjacent vacant lots
  - Educate residents on need for reducing hazardous fuels
  - Modify County and City Codes to require vacant lots conform to a fire safe standard
  - Explore options to increase fuel reduction on vacant lots
- Post Forest Practice activity (slash) fuel treatment
  - Educate non-industrial and industrial forest landowners about the added fire hazard created by remaining activity fuels
  - Work with non-industrial and industrial forest landowners to treat activities fuels within the designated Wildland Urban Interface Area beyond the requirements of the forest practice act
  - Explore incentives to ease the cost to non-industrial and industrial forest landowners to make it easier and more cost effective for them to treat activity fuels
  - Work with the Board of Forestry and Fire Protection to modify the forest practice standards for the treatment of activity fuels
- Fuel treatment and maintenance of hazardous fuels in planned subdivisions
  - Consider modification of County Codes to require hazardous fuel treatment on proposed developments prior to recordation of final map
  - Modify County Codes to require a plan for the maintenance of treated wildland fuels on proposed developments prior to recordation of final map
- Fuel treatment of private lands within communities-at-risk
  - Encourage collaborative community based hazardous fuel reduction projects
  - Implement recommended hazardous fuel reduction projects
  - Continue to pursue hazardous fuel reduction funding for communities
  - Explore incentives for landowners to reduce hazardous fuels
- Fuel treatment on public lands within communities-at-risk
  - Treat all public lands within community at risk boundary
- Fuel reduction in the adjacent and extended Wildland Urban Interface zone
  - Complete Butte Counties Strategy for Fuel Reduction including private, local, state and federal hazardous fuel reduction projects
  - Explore incentives for landowners to reduce hazardous fuels
  - Continue mitigation measures into extended Wildland Urban Interface
- Fuel reduction maintenance
  - Educate homeowners, citizen groups, organizations, agencies and other involved in fuel reduction
  - Develop methods and best practices based on fuel type for initial fuel reduction and fuel reduction maintenance

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- Require that fuel reduction project within developments, communities-at-risk, and the adjacent and extended Wildland Urban Interface areas
- Work with governing boards, agencies and lawmakers to develop, approve and regulate alternative methods for fuel reduction maintenance
- Explore incentives (e.g. tax breaks, reduction in insurance premiums, wave yield taxes, and exemptions) for existing landowners to maintain hazardous fuel reduction standards on their properties

**City of Biggs**

The City of Biggs Fire Protection Plan includes the following Goals, Policies and Programs:

Goal 6.3 Protect people and property within the City of Biggs against fire related loss and damage.

Policy 6.3.A At a minimum, maintain current levels of service for fire protection by continuing to require development to provide and/or fund fire protection facilities, personnel, and operations and maintenance.

Policy 6.3.B Require all new development to design public facility improvements to ensure that water volume and hydrant spacing are adequate to support efficient and effective fire suppression.

Policy 6.3.C Biggs shall strive to maintain, at a minimum, the City's current Insurance Service Office (ISO) rating of four (4).

Program 6.3.1 Continue to enforce the requirements of Public Resources Code Sections 4290 and 4291 on all development projects. This includes, but is not limited to the following:

- Maintain roofs of structures free of vegetative growth and debris
- Remove any portion of trees growing within ten (10) feet of chimney/stovepipe outlets
- Maintain screens over chimney/stovepipe outlets or other devices that burn any solid or liquid fuel

Program 6.3.2 In conjunction with Program 4.2.2, develop and adopt standards for fire suppression facilities, including water supply and distribution system standards, and fire hydrant spacing.

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Program 6.3.3 Review the desirability of requiring automatic fire protection sprinklers within new residential development. If determined desirable, incorporate such requirements within the City Building Code.

Program 6.3.4 Consider opportunities for augmenting the fire protection services which are provided through Butte County Fire Department, including increased firefighter staffing and acquisition of new equipment.

Program 6.3.5 The City shall consider amending existing ordinances or adopting a new ordinance which requires clear and recognizable addresses for all structures within the City of Biggs.

Program 6.3.6 Adopt the Uniform Fire Code to enhance Butte County Fire Department's operations in Biggs.

Program 6.3.7 Consider opportunities to improve the City ISO rating for the safety and economic benefits that an improved rating would net the City and its residents.

**City of Chico**

The Guiding Policies of the City of Chico Fire Protection Plan includes:

S-G-3 Continue to provide high quality, effective and efficient fire protection services for Chico area residents.

S-G-4 Minimize the loss of life and property resulting from the hazards of fire, medical and rescue emergencies, hazardous materials incidents, and disaster response and recovery within the City and surrounding Planning Area.

S-I-7 Maintain an average response time of four minutes or less for all proposed for urban development.

S-I-8 Maintain automatic aid agreements with other agencies in Butte County, with the long-term objective of having a single emergency response agency for the Chico Urban Area.

S-I-9 Work with the California Department of Forestry and Butte County Fire Department on the feasibility of a watershed protection contract for the Bidwell Park area and other areas that are prone to wildland fires to enhance city capabilities with tools such as air tankers and helicopters.

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- S-I-10 Explore the possibilities of requiring automatic fire sprinklers for all new development that is not within 1½ miles of an existing or planned fire station and fire-resistive construction and compliance with California's high rise building requirements for buildings over three stories in height.
- S-I-11 Encourage the County to adopt and implement a weed abatement program in the unincorporated areas of the Chico Urban Area and to require mitigation to reduce wildland fire hazards.
- S-I-12 Encourage the County to require development in unincorporated and within the City's Sphere of Influence to conform to development standards within the City, including but not limited to Uniform Building Code, Uniform Fire Code, water and street improvement standards.
- S-I-13 Develop standards to protect structures in wildland fire areas for inclusion in the *Best Practices Manual* or similar implementing program. These standards will include, for example, use of fire-resistant building and roofing materials, installation of fire-resistant landscaping, maximum road gradients, and clearance of vegetation proximate to structures.

**City of Gridley**

Following are the City of Gridley's General Plan Safety Goals and Fire Safety standards:

**Goals:**

1. Minimize the impact of hazards upon people and property by incorporation of safety considerations into the community development process.
2. Minimize the expansion or intensification of disasters once an event has occurred by insuring adequate community preparedness for rapid and efficient response.
3. Provide a reasonable safe habitat in which people may live, work or play.
4. Minimize loss of life and damage to property in the event of disaster.
5. Make existing structures as safe as possible.
6. Achieve the lowest possible community fire rating as fiscally possible for the City and its citizens.
7. Coordinate and augment area emergency response and mutual assistance agreements with neighboring cities, Butte County and the State of California.

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8. Support reasonable County, State and Federal efforts, plans and programs for disaster prevention and response.

**Standards**

1. Require that the community fire protection grade level as determined by a certified rating agency shall not exceed a grade of 4 by insuring that the following operational characteristics are fully adequate and reliable in meeting the City's fire protection needs:
  - Fire department manning to be based on the amount of area to be protected, the kind of fires to be encountered, the City's population, the inter-jurisdictional agreements the City enters into and the City's fiscal capability.
  - Fire fighting equipment and location to be determined by the variety of structures in the area, the available water supply, outside aid, the amount of areas to be protected, and the kind of fires to be encountered. Furthermore, facilities for the maintenance and repair of equipment should be sufficient to minimize equipment downtime. Equipment should be maintained in a ready and usable state in locations determined by necessary response time and any physical barriers slowing response.
  - Communication equipment capable of 24 hour alarm notification, equipment dispatching, unit coordination and coordination with other jurisdictions. Backup systems to be provided in case of failure.
  - Water supply in such quantity that maximum daily consumption and required fire flow requirements can be met at the same time. The supply system should be such that in case of pump failure, water can be shunted to critical areas from other wells.
  - A distribution system of sufficient capacity so required fire flows can be delivered to all built up areas with consumption at the maximum daily rate. Whenever possible, a gridiron network should be used with cross connections for looping and mutual reinforcement. Mains should be valved so that sections can be bypassed in case of failure. Main sizes under eight inches should not be dead-ended.
  - A fire hydrant system whose design and spacing is based on the available fire flow and the type of land uses being protected. Hydrants in commercial areas should be at smaller intervals than those in residential areas. The maximum fire hydrant interval should not exceed five hundred feet.
  - Fire zones delineated for the protection of closely built commercial or industrial districts to keep fires from spreading from building to building. Restrictions would include minimum fire wall requirements and restricted construction materials.
  - Enforcement of Title 19 of the California Administrative Code, a Uniform Fire Code or Fire Prevention Code, and a Uniform Housing Code for abatement of unsafe residences.

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**City of Oroville**

Following are the City of Oroville's Fire Hazard Objectives and Implementing Policies:

**Objective: Fire Hazards**

8.30a Work to prevent wildland and urban fire, and protect lives, property, and watershed from fire dangers.

**Implementing Policies: Fire Hazards**

8.30b Within the built areas of the City, strive to comply with ISO recommendations for fire engine response.

8.30c Within developed portions of the Planning Area, enforce fire protection standards as adopted by the Oroville City Council.

8.30d Within rural and undeveloped portions of the Planning Area and in the urban-wildland interface, enforce fire protection standards as specified by the California Department of Forestry and Fire Protection and the Butte County Draft Energy, Natural Resources, and Recreation Element.

8.30e Monitor fire-flow capability of the water systems throughout the Planning Area, and support all efforts to improve water availability at all locations that have flows considered inadequate for fire protection.

8.30f Consider revision of the Fire Sprinkler Ordinance, if necessary, to provide protection in remote areas that cannot achieve adequate fire flows in the water systems.

8.30g Pursue the most effective and cost conservative methods of providing fire protection including the exploration of contract services with adjoining departments.

**Town of Paradise**

Town of Paradise's Fire Management Goals, Objectives, Policies, Implementation Measures and Fuel Reduction Plan including the Fuel Modification Concepts:

**Goals**

SG-1 Assure that law enforcement and fire protection services are enhanced sufficiently to meet the demands of new and existing land use development.

SG-2 Provide adequate access, including emergency vehicle access and evacuation, to all new parcels and existing parcels where feasible.

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SG-6 Improve the communication system(s) used during townwide emergencies, such as wildland fires, earthquakes or volcanic occurrences.

**Objectives**

SO-2 Maintain an overall fire insurance (ISO) rating of three or better, and an emergency fire response within five minutes for 90% of all emergency incidents within the Town Limits.

SO-4 Designate an emergency aircraft landing area within three years.

**Policies**

SP-2 Through the development review process, adequate roads shall be required to be constructed and/or improved for emergency vehicle access, particularly in high wildland fire hazard areas.

SP-3 Future development should be designed and constructed to take maximum advantage of known fire and crime prevention siting, orientation and building techniques.

SP-4 The town shall work with the Del Oro Water Company, the Paradise Irrigation District and the Lime Saddle Community Services District to assure the adequacy of fire flow and peakload water supplies.

SP-5 The town should promote fire prevention by continuing to require brush removal and fuel load clearing as ongoing conditions of development approval and property maintenance.

SP-6 The town should maintain adoption of a current Uniform Fire Code amended to reflect the unique needs of Paradise, and require compliance with its provisions.

SP-7 New fire stations(s) shall be located so that all areas within Town Limits are within a five-minute emergency response time for 90% of all emergency incidents. New fire station locations should be within a one-half mile radius of the symbols indicated on the *Land Use Diagram*.

SP-8 The town shall encourage Butte County to enforce standards conforming to the fire safety standards established by the state Board of Forestry for state responsibility areas within the Paradise secondary and tertiary planning areas, including:

- Road standards for fire equipment access
- Standards for signs identifying streets, roads and buildings
- Minimum private water supply reserves for emergency fire use

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- Fuel breaks and greenbelts
- Land use policies and safety standards that take into account the recurrent nature of wildland fires
- Design standards establishing minimum road widths and clearances around structures
- Emergency preparedness protocol and procedures
- Maximum length of cul-de-sac roadways

**Implementation Measures**

- SI-1 Establish standards for adequate fire flows for new land use development and expansion of existing development.
- SI-2 Review existing standards for roadway widths, emergency access and road and structural identification and amend as necessary.
- SI-3 Establish law enforcement and fire protection impact fees for new land use development sufficient to assure that established levels of protection are maintained.
- SI-4 If feasible, establish law enforcement and fire protection service fees for existing land uses sufficient to assure that established levels of protection are maintained.
- SI-5 Educate residents regarding the dangers of seismic activity and wildland fires, and the Town of Paradise Multihazard Disaster Plan and adopt the Town of Paradise Multihazard Disaster Plan by reference in the General Plan.
- SI-6 Enforce and comply with the provisions of the Uniform Building Code and the Uniform Fire Code.
- SI-7 Require adequate dry brush clearance around structures.

**Fuel Reduction**

Roadside Fuel Reduction Zone (RSFRZ). Areas along roadways, approximately 10 to 50', where fuels are thinned or removed. The primary purpose is to create safe access for fire equipment and egress for residents. This zone also provides potential control lines which can be easily improved during fire fighting operation or can be used for "firing out" operations.

Fuel Reduction Projects (FRP) Fire Breaks. Complete, or nearly complete, removal of fuel in strategic locations which serve a control line that can be easily improved in a fire

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situation. Fuel breaks are usually located along power line right-of-ways or on other private lands.

Shaded Fuel Reduction Projects (SFR). Removal or reduction of vegetation in areas adjacent to structures in the interface between wildland and structures. In fire fighting terminology, this is known as the "I-Zone". This area is included in the Town of Paradise Hazard Abatement Ordinance and is normally considered to be the first 30' to 150' feet from the structure. However, the Shaded Fuel Reduction actually includes up to 300' from the structures depending on the type and size of the vegetation in a specific area and the slope or topography of the area. The goal in this zone is to remove, reduce or replace the highly flammable surface vegetation, limb up trees and thin out small flammable trees to make the structures defensible in a wildland fire. Shading reduces the surface fuel temperature, increases humidity, and discourages re-growth of sun tolerant shrub species.

These projects would be achieved by the following methods:

1. Hand Crews: Including Private Contractors, California Conservation Corp. (CCC), California Department of Corrections Inmate Crews, Sheriff Work Assistance Program (SWAP), Private Industry Council (PIC), Youth Groups, and other organized groups.
2. Mechanical Deloading: This would include:
  - Dozer pile and burn operations
  - Mechanical mastication
  - Dozer/excavator clearing, combined with biomass fuel removal
3. Livestock Grazing:
  - Goats used in spot applications
  - Commercial grazing used in light fuels where practical

**Current Fuel Reduction Projects:**

Top of Paradise Fuel Reduction Project (TOPFRP). This six mile long project is currently being completed. The TOPFRP runs north from the completed West Branch FRP to the top of Paradise, then runs southwest along the rim of Little Butte Creek Canyon to Bille Park.

Dry Creek Fuel Reduction Project East Phase and West Phase. These are two parallel projects that form a "U" shape in the Dry Creek drainage as just south of Pearson Road. These shaded fuel breaks will total a combined two miles and will tie into fuel reduction work completed in adjoining subdivisions as conditions of approval. These projects have been funded and are slated for completion in 2005/2006.

**Additional Projects**

- Clear Creek Fuel Reduction Project
- Morgan Ridge Roadside Fuel Reduction Project

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- South Paradise Fuel Reduction Project
- Old Clark Road Fuel Reduction Project
- Eden Road Fuel reduction Project
- Wayland Roadside Fuel Reduction Project
- Paradise Vegetative Management Project
- West Paradise Fuel Reduction Project

**Goals for 2005/2006**

- Complete the six mile “Top of Paradise” Fuel Reduction Project.
- Complete Dry Creek Fuel Reduction Project West and East Phase
- Develop severity zones for the Town of Paradise to be used to increase requirements for defensible space and fire resistive building construction.
- Complete 500 defensible space inspections
- Acquire a grant for 2006 to continue fuel reduction projects around Paradise.
- Conduct a major Wildland Urban Interface training exercise.

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**Hazard: Flooding**

**Jurisdictions Affected by Flooding**

<b>Butte County Probability: Very High</b>	<b>Butte County Severity: High</b>
<b>Biggs Probability: High</b>	<b>Biggs Severity: High</b>
<b>Chico Probability: High</b>	<b>Chico Severity: Medium to High</b>
<b>Gridley Probability: High</b>	<b>Gridley Severity: High</b>
<b>Oroville Probability: Very High</b>	<b>Oroville Severity: High</b>
<b>Paradise Probability: Medium</b>	<b>Paradise Severity: Low</b>

**Hazard Definition**

A flood is defined as an overflowing of water onto an area of land that is normally dry. Floods generally occur from natural causes, usually weather-related, such as a sudden snow melt, often in conjunction with a wet or rainy spring or with sudden and very heavy rainfalls. Floods can, however, result from human causes as a dam impoundment bursting. Dam break floods are usually associated with intense rainfall or prolonged flood conditions.

Dam failure may be caused by faulty design, construction, and operational inadequacies. The cause can also be due to a flood event or earthquake larger than the dam was designed to accommodate. The degree and extent of damage depend on the size of the dam and circumstances of failure. A small dam retaining water in a stock pond may break resulting in little more damage than the loss of the structure itself. In contrast, a dam break could result in the loss of irrigation water for a season causing extreme financial hardship to many farmers. An even larger dam failure might bring about considerable loss of property; destruction of cropland, roads, and utilities; and loss of life. Other consequences can include loss of income, disruption of services, and environmental devastation.

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Floods are generally classed as either slow-rise or flash floods. Slow-rise floods may be preceded by a warning time lasting from hours to days, or possibly weeks. Evacuation and sandbagging for a slow rise flood may lessen flood-related damage. Conversely, flash floods are the most difficult for which to prepare due to the extremely short warning time, if there is any at all. Flash flood warnings usually require immediate evacuation.

For floodplain management purposes, the following discussion describes the Federal Emergency Management Agency (FEMA) definition of "100-year flood." The term "100-year flood" is misleading. It is not a flood that will occur once every 100 years. Rather, it is the flood elevation that has a 1 percent chance of being equaled or exceeded each year. Thus, a 100-year flood could occur more than once in a relatively short period of time. The 100-year flood, which is the standard used by most federal and state agencies, is used by the National Flood Insurance Program (NFIP) as the standard for floodplain management and to determine the need for flood insurance. A structure located within a special flood hazard area shown on a map has a 26 percent chance of suffering flood damage during the term of a 30-year mortgage.

### **History**

Butte County has proclaimed nine states of emergencies due to flooding since 1950 and residents have submitted over \$3 million in flood insurance claims since 1978. Butte County has a Mediterranean climate with cool, wet winters and hot, dry summers. A wide range of precipitation has been recorded through Butte County. Precipitation is normally in the form of rain, with snow in the higher elevations, and ranges from approximately 20 to 80 inches per year. Flooding problems in Butte County occur in the mountains as well as the poorly drained valley floor. Butte County's foothill and upland areas generally do not have flooding. However, drainage problems in the Paradise and Butte Meadows areas do exist. The runoff from impervious surfaces is also a concern, particularly because the surface area of impervious cover is increasing.

The entire City of Biggs is located outside of the 100 year flood zone as defined by the Federal Emergency Management Agency (FEMA), due to protection provided by the Oroville Dam. However, localized flooding occurs in and around Biggs during storms of less than 100 year proportions. Two primary types of regional flooding have the potential to threaten the City of Biggs. These are the failure of a dam located "upstream" from the City and the failure or overtopping of the Feather River levees. Several Dams located above Biggs are also located above Oroville Dam and, in the event of failure of these dams, floodwater would be contained in Lake Oroville. Four dams are located such that failure might create flooding within Biggs. These are the Oroville Dam itself and three structures which create the Thermalito complex: the Thermalito Diversion Dam, the Thermalito Forebay Dam, and the Thermalito Afterbay Dam.

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Magalia Dam, located along Little Chico Creek, has been identified as at risk to failure in the event of significant seismic activity. However, in the event of such failure floodwater would be slowed by the Little Chico Creek canyon and would be conveyed to the Sacramento River. No flooding in the vicinity of Biggs would be anticipated from failure of Magalia Dam. A primary cause of dam failure is exposure to seismic activity. The California Department of Water Resources has identified dams which are considered safety hazards due to potential damage resulting from earthquakes. Oroville Dam and the Thermalito complex are not considered at risk to seismic activity.

An area of local flooding is located on the north ends of Third Street and Second Street. This area of flooding encompasses some ten residential lots. The high water level reaches an elevation of about eight or ten inches above the street curb. Protection against local flooding is addressed specifically within the Public Facilities section under the topic of Storm Drainage Facilities. Overtopping of Sacramento River levees is not a significant concern due to the general topography of the region. Levee failure or overtopping of the Sacramento River in areas above Biggs would be directed to the Butte Sinks area and would not directly affect the City.

Storm water runoff has, at times, created localized flooding problems in the City of Chico and the agricultural area west of the City. High Sacramento River flood stage creates a backwater in the creek and tributaries, which pass through the Planning Area, and may delay runoff from entering the river. The Flood Insurance Rate Map (FIRM) for unincorporated Butte County shows Sacramento River overflow inundating an area about two miles east of the river boundaries. The volume of water within this two-mile backwater area would be expected to increase over time with additional urban runoff associated with growth as well as from natural drainage.

Capacities of channels in the western portion of the City of Chico Planning Area are also limited, and potential floodflows are believed to be higher than recorded historical occurrences. The FIRM shows floodwater flowing out of the Big Chico Creek Channel near the western edge of the Planning Area. Inadequate channel capacity exacerbates the flooding potential near the Sacramento River. Flood control projects on Little Chico, Big Chico, and Lindo Channel have helped reduce the amount of runoff that flows through the City of Chico, reducing potential flooding problems.

Floods of record occurred in December 1937, December 1955, December 1964, February 1986, January 1995, and January 1997, ranging between 20-year to more than a 100-year storms, and caused hundreds of thousands of dollars of damage.

The following table depicts the most recent flood events in Butte County.

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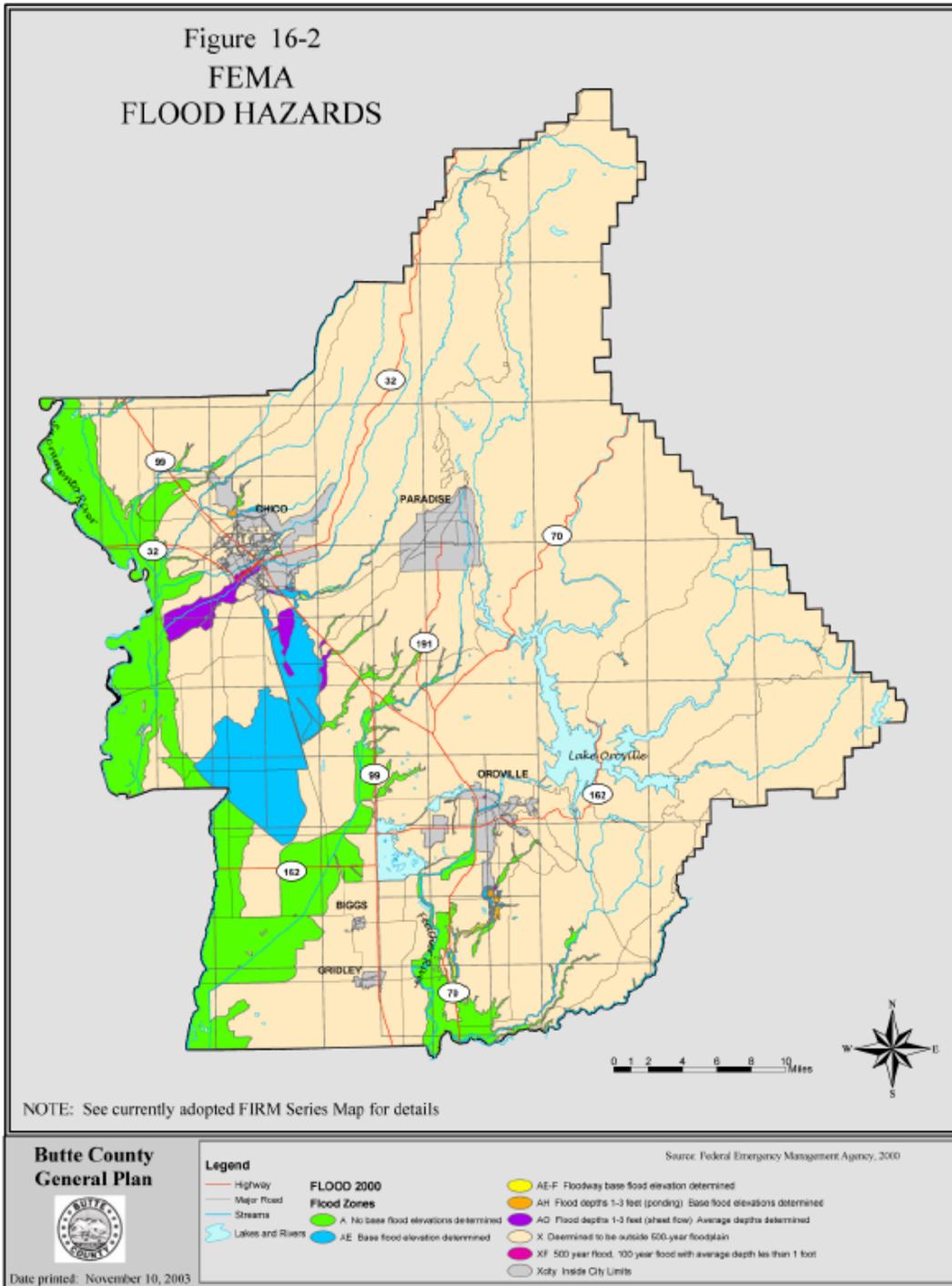
Location	Date	Type	Death/ Injuries	Reported Property Damage
Little Chico Creek	12/1964	Flooding	0	Unknown.
Ruddy Creek/Ruddy Creek Tributary	02/1986	Flooding	0	Some flood damage.
South Portion	02/08/1993	Flash Flood	0	\$50,000. Water flowed into ten homes and four businesses in Palermo and three homes in Gridley.
Rock Creek Keefer Slough Areas	01/1995	Flooding	0	Homes flooded, State Highway 99 covered with flood water for several hours.
Palermo	01/22/1997	Flash Flood	0	Heavy rains brought two small creeks in the town above their banks, damaging 10 homes.
Butte Creek Canyon	01/22/1997	Flash Flood	0	Flooding from Butte Creek damaged 20 homes and buildings.
Chico	01/22/1997	Flash Flood	0	Flooding damaged 20 homes as heavy rains overflowed in more urbanized areas and along the City's creeks.
Little Chico Creek	02/03/1998	Flooding	0	Flood surge which resulted in the flooding of Alberton Avenue Bridge
Palermo	01/31/2005	Flash Flood	0	5+ homes flooded, Post Office, Market, downtown intersection flooded with six to eight inches of water.
Rock Creek/Keefer Slough Areas	Winter of 2005	Flooding	0	State Highway 99 covered with flood water for several hours. Multiple occurrences. Extensive bank erosion in several areas. One property owner lost an acre of land due to erosion.
Butte County	Winter of 2005	Flooding	0	Extensive road damage through the County totaling over \$774,000.00

Source: NOAA National Climatic Data Center, U.S. Department of Commerce; State of California Office of Emergency Services; Butte County Office of Emergency Services

The following map depicts the flood hazards in Butte County.

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Summarized below are the principal flood problems in Butte County:

**Big Chico Creek:** Flooding hazards within the Big Chico Creek watershed is attributed to potential high flows from Lindo Channel, Sycamore Creek, Rock Creek, Keefer Slough, and Big Chico Creek.

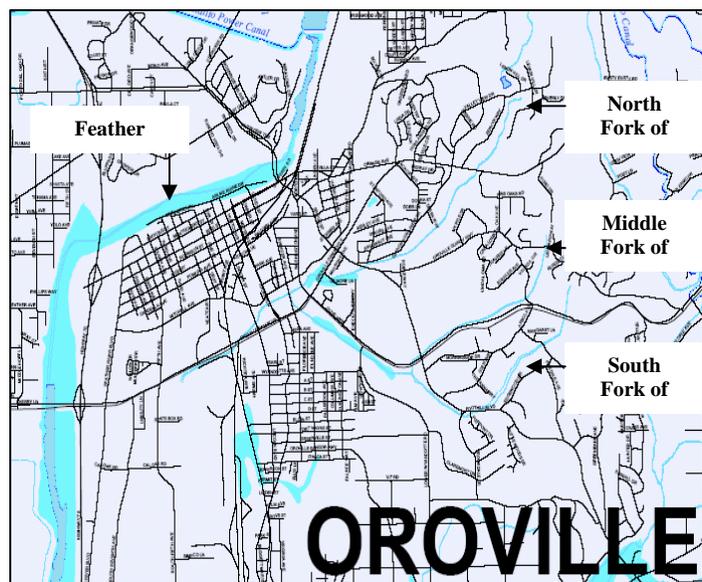
**Butte Creek:** There have been seven high discharge events on Butte Creek, as recorded by a gauge maintained by the U.S. Geological Survey (USGS). According to the FEMA FIS and FIRMs, the water surface elevations under a 100-year and 500-year storm event would encroach on the levee freeboard and overtop part of the levees along Butte Creek. The Butte Creek levees were constructed in the 1950's and the condition of the levees at this time, with respect to structural integrity or seepage, is not known.

**Cherokee Canal:** Cherokee Canal experiences flooding due to heavy rains and valley flooding. The primary flooding hazards within the Cherokee Watershed is caused by sedimentation and structures located within the FEMA Special Flood Hazard Area (SFHA).

**Dead Horse Slough:** The Dead Horse Slough crossing at El Monte Avenue experiences periodic inundation and nearby structures have inundated as recently as 1997. In the lower reaches of Little Chico Creek, the Little Chico Creek crossing at Alberton Avenue and at Taffee Avenue has experienced levee overtopping, sheet flow flooding, and levee seepage.

**Feather River/Lower Honcut Creek:** Flooding in the Feather River/Lower Honcut Creek watershed has been attributed to several sources: Dry Creek and its tributaries, stormwater drainage in the City of Oroville, the Feather River, and Wyman Ravine. The three major forks of Dry Creek originate and join within the City of Oroville's urban area. The flood hazards witnessed in this watershed include:

- **Dry Creek:** During high flow events, the northernmost fork of Dry Creek (Zone A SFHA, no BFE designated. FEMA FIRM dated June 8, 1998) exceeds channel capacity and inundates the Oroville urban area. There are seven detention basins on the three forks. One of these detention basins is the Argonaut



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basin, located on the middle fork of Dry Creek, which fills up before all others in the system. Channel erosion in the tributaries of Dry Creek was evident through the developed areas in the City of Oroville.

- **Dry Creek Tributaries Confluence:** Heavy development and excessive erosion near the confluence of the three main forks of Dry Creek (Zone A SFHA, no BFE designated. FEMA FIRM dated June 8, 1998), in the City of Oroville urban area, exposes nearby residents to potential flooding.
- **City of Oroville Stormwater Drainage:** The limited capacity of the urban stormwater drainage pipes in the downtown area restrict the volume of water that can be conveyed to the Feather River, leading to local flooding at different locations in the City.
- **Feather River:** During high flows in the Feather River water rises through the gravel deposits in the industrial area near the Feather River Boulevard on the west side of the City of Oroville (Zone A SFHA, no BFE designated. FEMA FIRM dated June 8, 1998). The severity of this problem is proportional to the water surface elevation in the Feather River, which is contained by levees above the adjacent ground, through the industrial area. A boil in the Feather River concrete levee near 4<sup>th</sup> Street and Safford Street creates a leak during high flow events. This levee is maintained and operated by the City of Oroville.
- **Wyman Ravine and Tributaries:** Wyman Ravine, which is located south of the City of Oroville and runs northeast to southwest in that reach, floods nearby houses, Palermo, Highway 70 and many County Roads including Alice Avenue, Lone Tree Road, Cox Lane, Stimpson Road, Central House Road, Middle Honcut Road, Lower Honcut Road and Railroad Avenue in the lower reach. (BFE = 149 ft., FEMA FIRM dated June 8, 1998).

**Hazelbrush Levee:** The Hazelbrush Levee is the western levee of the Feather River below the Thermalito Afterbay spillway. This levee is located where the Feather turns from southwest to the south and immediately downstream from this area the Feather River channel is constrained by rock piles from gold rush days. The combination of the channel turn and channel blockage, along with the location above Biggs, represents a significant threat to Biggs. A proposal that has been discussed within the City is the reopening of passages beneath the Union Pacific Railroad tracks to allow water to flow to the west in the event of a levee failure above Biggs. Originally built on trestles, the base of the rail has been filled and now serves as a levee. Unfortunately, in the event of a levee breach northeast Biggs, flood water would flow in a generally southwest direction and upon meeting the rail tracks would be forced toward Biggs.



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**Little Chico Creek:** Flooding in Little Chico Creek has largely affected residents within the City of Chico urban area; however during high flow events the lower section of the watershed has experienced substantial damage. Flooding hazards are primarily excessive vegetation in the Little Chico Creek channel, flooding from Dead Horse Slough, flooding in the lower reaches of Little Chico Creek, and the levees along the Little Chico Creek-Butte Creek Diversion channel. DWR is responsible for maintenance of the levees and channel, funding is provided by County property owners through Maintenance Area 5.

**Magalia Dam:** Magalia Dam, located along Little Butte Creek, has been identified as at risk to failure in the event of significant seismic activity. In the event of such failure floodwater would cause significant damages in the Little Butte Creek and Butte Creek Canyons and would exceed the capacity of the downstream Butte Creek levees.

**Pine Creek:** Pine Creek is a significant watershed in Tehama County; the downstream portion is the smallest watershed in Butte County. Additionally, the Pine Creek Watershed has a very low population density. Flooding in the Pine Creek watershed has been attributed to limited channel capacities due to excessive vegetation and sediment deposits, which occur in both Pine Creek and its main tributary, Singer Creek.

**Ruddy Creek and Ruddy Creek Tributary:** Areas of flooding along Ruddy Creek have been noted throughout the basin. Flood damage was reported after the February 1986, January 1995, January 1997 and February 1998 storms. Since the 1989 FIS, widespread flooding was observed in the 1995, 1997, and 1998 winter seasons.

**Lake Oroville Operations.** Immediately prior to the January 1, 1997 storm, DWR began releasing water and created an additional 200,000 acre feet storage capacity in Lake Oroville. These releases likely averted a catastrophe of much greater proportions for Butte County.

**Levee Failure / Overtopping.** Both the Sacramento and the Feather Rivers pass through the southwestern portion of Butte County. Failure or overtopping of the levees along the Feather River could result in minor to severe flooding depending on the type of levee failure and/or the volume of flow present at the time of failure. The segment of the Feather River from which overflows would affect the County falls within Department of Water Resources (DWR) Management Area 7. DWR levees are inspected twice annually and receive regular maintenance. To date, no significant deficiencies have been identified within Management Area 7. DWR has estimated the channel capacity in Management Area 7 to be 210,000 CFS. Due to channel limitations of the Feather River near the Yuba River and below Bear Creek, the maximum allowed release criteria for Oroville Dam is 160,000 CFS. Structurally, the release gates can allow controlled releases of up to 250,000 CFS.

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Emergency spillway design capacity of Oroville Dam would allow up to an additional 629,000 CFS of uncontrolled release. The Corps has estimated the capacity of the Feather River in Management Area 7 to be 210,000 CFS. DWR has estimated that a 200 year storm event would require releases of 170,000 CFS from Oroville Dam and that a 500 year storm event would require releases of 250,000 CFS. In the event that conditions require unusually high release rates (in excess of 150,000 CFS) DWR would notify local jurisdictions and emergency response agencies. Additionally, flows would be increased incrementally to allow for evacuation if determined necessary. In February of 1986, exceptional runoff conditions required unusually large releases of water into the Feather River. Following the 1986 floods, the U.S. Army Corps of Engineers (Corps) conducted an evaluation of Feather River levees. In early January of 1997 an unusually warm storm series resulted in exceptional rainfall/runoff in the Sierra Nevada immediately after a series of heavy snow storms. During the six day period of the storm as much as 40 inches of rain fell within the Sierra Nevada.

The greatest threat of the 1997 storm was the potential for overtopping Oroville Dam. At the peak of the storm inflows to Lake Oroville were 358,000 CFS and the lake level was rising 1.5 feet in elevation per hour. The maximum lake level was 13 feet below the emergency spillway elevation. If heavy rainfall had continued an additional six to eight hours, release rates from Oroville Dam would have been much greater than the approximately 160,000 CFS which DWR released during the 1977 event and Feather River levees might have been overtopped, resulting in flooding.

**Other Flood-Related Hazards: Bridges**

Bridge damage and collapse due to high velocity flow and excess debris pose a risk to life and can cause damage to property and structures. According to Flood Damage Survey Reports (DSR) conducted by Natural Resource and Conservation Service (NRCS) and Butte County for FEMA, the flood event in 1997 caused:

- Embankment failure to the Oroville-Chico Highway, 1.1 miles east of Midway Road. The eroded material was replaced with rock fill to the original profile, resulting in \$21,000 in repairs.
- The Butte Creek Bridge on Nelson Road, eight miles west of Highway 99, had extensive damage to the support columns and embankment, resulting in \$68,000 in repairs.
- Erosion of the piers and the bank on the north side of the Honey Run Covered Bridge had to be repaired to its original condition, costing \$16,000.

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- Damage to the Butte Creek Bridge at Humboldt road due to excessive rock, trees, and debris carried by floodwaters resulted in over \$25,000 in repairs.
- The bridge at Humboldt Road and Colby Creek sustained damage to the bridge abutment and guardrail and cost over \$12,000 in repairs.
- The Sycamore Valley Road junction with Cohasset Road at Cohasset Bridge sustained damages behind the bridge wingwall, where floodwaters overtopped the roadway, washing out behind the bridge wingwall and cost over \$6,000 in repairs.
- The Meridian Road Bridge was overtopped causing pavement deterioration and washout of the riprap, resulting in a portion of a \$7,000 repair.
- The Pine Creek Bridge on Nord Gianella Road sustained debris damage resulting in almost \$6,000 in repairs.
- The Skyway Bridge at Butte Creek sustained damages that cost almost \$4,000 in repairs.

**Risk Assessment**

The larger streams in Butte County are subject to heavy runoff, and a number of smaller streams have caused considerable flood damage in the past. While significant steps have been taken to control the most serious flood hazards, many areas of Butte County remain vulnerable to flooding. The seriousness of flooding in these areas has grown in the last 20 years because development continued in areas that were previously thought to be out of the exposed floodplains. Now many of these areas are known to be prone to flooding. As the Sacramento Rivers meanders within the floodplain, its channel in the Butte Basin area, upstream from the project levees, is largely uncontrolled.

The river's action plays a key role in shaping the topography and determining land uses within the area. Within the Sacramento River floodplain the lands are low and flat, characterized by meandering channels, natural levee terraces, swales, and associated wetlands, swamps, and ponds. Private levees have been erected along the banks of a large portion of Wyman Ravine. However, levees along the lower portions do not contain 10 year storm events and their effectiveness during 100 year floods are negligible. A levee extending approximately 3,500 feet north of Palermo Road to 2,000 feet upstream of Lincoln Boulevard is more significant.

Several levee systems have been constructed along Butte Creek, Cherokee Canal, Big Chico Creek, Hamlin Slough, Little Chico Creek-Butte Creek Diversion Channel,

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Comanche Creek, and Little Chico Creek. An evaluation of these levees found that they do not provide protection from 100 year flood events. Inadequate levees and/or channel capacities were found on portions of the following streams: Butte Creek downstream of the Skyway, Hamlin Slough, and the Little Chico-Creek downstream of the Butte Creek Diversion Channel, Comanche Creek, and Cherokee Canal. During intense storms, water would typically over-top these levees and break out of the channel, usually not returning for several thousand feet, if at all.

The Sycamore-Mud Creek and Sandy Gulch Corps project levees provide a 100-year level of protection for the Chico Area.

- **Effects on people and housing.** Direct impacts of flooding can include injuries and loss of life, damage to property and health hazards from ruptured sewage lines and damaged septic systems. Secondary impacts include the cost and commitment of resources for flood fighting services, clean-up operations, and the repair or replacement of damaged structures.
- **Effects on commercial and industrial structures.** Depending on the geographic area involved and the economic and demographic characteristics of the area, the effects on industry and commerce may be significant. Flooding can cause damage to commercial and industrial structures, damage to vegetation, crops and livestock. Flooding also has long term impacts on agriculture, preventing the planting of crops and reducing the productivity/life of orchards.
- **Effects on infrastructure.** A slow-rising flood situation will progress through a series of stages, beginning with minor rainfall and evolving to a major event such as substantial flooding. Once flooding begins, personnel will be needed to assist in rescuing persons trapped by flood waters, securing utilities, cordoning off flood areas, and controlling traffic. These actions may overtax local agencies, and additional personnel and resources may be required. Flooding can cause damage to roads, communication facilities and other infrastructure. Road inundation can severely impair interstate commerce, impacting commercial and industrial ventures.

**Risk assessment conclusion.** Flooding due to heavy precipitation is a potential hazard in Butte County with the resultant possibilities for damage to property and loss of life. Severe flooding can be particularly costly and have long term effects.

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**Relationship to Other Hazards – Cascading Effects**

Floods can cause many cascading effects. Fire can break out as a result of dysfunctional electrical equipment. Hazardous materials can also get into floodways, causing health concerns and polluted water supplies. In many instances during a flood, the drinking water supply will be contaminated.

**Plans and Programs**

The delineation of flood boundaries and adoption of County Ordinances regulating development within identified flood plains/floodways are the basic flood management tools that the County uses to identify flood hazards and implement its own flood management programs. Flood hazards in the County have been evaluated in an effort to develop effective flood policies and implementation measures to aid in reducing adverse impacts resulting from flood events.

Corrective flood control projects have alleviated most of the dangerous and life threatening flooding problems in the County. The most notable of these projects was the construction of the Oroville Dam and related flood control projects. Also, the streams designated for flood control projects by the Flood Control Act of 1944 corrected many serious flood problems along the Sacramento River and its tributaries, including Mud Creek, Sandy Gulch, Big and Little Chico Creeks, Butte Creek, and Cherokee Canal.

The most frequently used flood control technique in the County is retention or detention of peak runoff to, at, or below predevelopment levels. Another approach to flood control involves comprehensive watershed management. Comprehensive watershed management does not solely focus on flood control – it focuses on management of the floodplain by providing wider areas for flooding using a combination of setback levies, floodwalls, and other structural and non-structural designs. The comprehensive watershed management design concept allows for the natural development of riparian habitat within the flood plain, reduction in flood management has been gaining national and statewide consideration, and significant grant funding has been provided to foster the development of a comprehensive Floodplain Management Plans approved by the Board of Supervisors, which the Butte County Office of Emergency Services administers. A County Ordinance adopted in March 1983 enforced flood hazard prevention establishing Article IV in Chapter 26 of the Butte County Code. Through this Code, the floodplain administrator has the authority to enforce County flood hazard prevention policy. Within areas subject to flooding that are proposed for subdivision, the County is required to ensure the following:

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1. All such proposed developments are consistent with the need to minimize flood damage.
2. Subdivisions and parcel maps shall, as a condition of approval, establish regulatory flood elevations and note same on final maps prior to recordation of the final map.
3. Adequate drainage is provided to reduce exposure to flood hazards.
4. All public utilities and facilities are located so as to minimize or eliminate flood damage.

The relatively minimal reported damages and loss of life attributed to flooding over the past 25 years in Butte County indicates that the current land use management practices in Butte County have proven effective. However, increasing development and population growth will require disciplined land use management practices to ensure that urbanization of land protected by levees does not occur and is not allowed to exacerbate the affects of flooding in other areas.

The following table identifies flooding problems in Butte County and the suggested improvements as noted in the Butte County General Plan of 2005.

<b>Study Location</b>	<b>Problems Identified</b>	<b>Suggested Improvements</b>
Thermalito	Many existing conduits found to be inadequate to accommodate existing and rear future flows. Many areas undrained due to lack of facilities.	Utilize natural drainage courses in conjunction with additional well placed drainage improvements. Such improvements include new trunk lines, and several additional culverts channels.
North Chico Specific Plan Area	Few existing drainage facilities to off-set increasing development resulting in increasing land divisions creating many small parcels.	Improvements of existing storm drain facilities, and addition of new facilities to serve ultimate urban development. New improvements include on-site detention to reduce peak runoff, a trunk facility with collector lines to existing water courses such as Rock Creek or Sycamore-Mud Creek.
South-East Chico, Chapman Area	Little existing street improvements such as curbs, gutters, and sidewalks. No existing storm drain facilities in many areas.	Construction of storm drain facilities such as curbs and gutters and conduit. Adoption of drainage plan for area.
Northern Butte County, Northwest of Chico	Area plagued by recurrent flooding due to contributing upstream drainage area, a broad natural floodplain and poor channel alignment.	Install diversion/detention facilities to reduce/rechannel excess floodwaters to improvements constructed by the Army Corp of Engineers south of the tributary area.
South East of	Existing facilities are inadequate to	Replace a series of undersized culverts and

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<b>Study Location</b>	<b>Problems Identified</b>	<b>Suggested Improvements</b>
City of Oroville area (Wyman Ravine)	handle existing and future flows.	other drainage structures. Adoption of a drainage plan for the tributary area.
City of Chico and Surrounding Area	<p>A need to evaluate current facilities and plan for future development, by way of outlining planning criteria.</p> <p>Environmental impact report addressing the adoption of the Chico Urban Area Draft Storm Drainage Master Plan relating to a 5000 ac. Annexation.</p>	<p>Follow adopted City Master Plan for planning / design criteria which designates new facilities to meet future needs across jurisdictional boundaries.</p> <p>EIR references prior City Master Plan in 1997 for future improvements of areas lacking in storm drain systems and strategies for improving areas with existing storm drain systems.</p>
Town of Paradise	Field inventory of existing drainage facilities shows that past adopted policies were many times ignored either through lack of knowledge or indifference.	Create planning criteria designating more strict and controlled regulation of development. Master plan provides developmental guidelines and a schedule of improvements for the planned area.
North of Chico, Rock Creek- Keefer Slough Area	Location experiences flooding problems during periods of high intensity storms. Overland flow from approx. 50 sq. mile upstream tributary area causing significant flooding problems coupled with old channels within district boundaries and undersized culverts.	A U.S. Army Corps of Engineers Feasibility Study will provide cost-of-solution data for the proposed improvements, such as setback levees, floodwalls, channels and drainage structures. Study will enable local property owners to make a determination on funding projects. Complete the Rock Creek Keefer Slough Flood Plain Study and implement appropriate actions to reduce flooding.
East Chico Area: 1978 Rolls, Anderson and Rolls Study Area.	Only two areas were identified within the study area as having existing underground drainage facilities. Runoff calculations indicated the storm drains for both areas are undersized compared to the area being drained.	Study of drainage patterns shows the size and location for eight additional storm drains to drain the study area for both existing and future development. Adoption of a drainage plan for the tributary area.

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**Mitigation Goals and Strategies**

**Butte County**

Butte County's mitigation measures include:

- **Flood Hazard - Lindo Channel Diversion:** Levee erosion, debris accumulation, and lack of freeboard at, and downstream of, the Lindo Channel Diversion at Five-Mile Park.

**Mitigation - Gravel Management Program:** A long-term gravel management program should be developed and implemented, to include habitat rehabilitation (i.e. gravel re-introduction downstream of the diversion), protecting the levee from erosion while maintaining capacity of the channel, and allow for safe and relatively easy debris removal and temporary storage on the right bank during high flow events. The gravel management program should also include the installation of debris deflectors on the bridge located downstream on Sycamore Creek. The development of the long-term gravel management program should include the input of local residents, watershed groups, and agencies.

- **Flood Hazard - Sycamore Creek:** Channel bank erosion, sedimentation, head-cutting, and debris accumulation at the Sycamore Creek Diversion near Marigold Road and debris and sediment accumulation at the Sycamore Creek Diversion crossing at the Cohasset Road Bridge.

**Mitigation - Detailed Study, Energy Dissipation Mitigation, Erosion Control Mitigation; Sediment and Debris Removal:** The erosion sites throughout the channel should be inventoried and surveyed and followed by hydraulic modeling to evaluate channel capacity and rate of erosion and sediment transport. Once complete, specific energy dissipation and erosion control measures should be recommended in the Butte County General Plan and implemented through FEMA funding, Butte County's current channel maintenance programs and DWR's local levee maintenance program. Sediment loads from upstream sources, such as Sycamore Canyon, should be addressed to minimize need for sediment removal and wetland disturbance. The removal of sediment from upstream sources should be incorporated into Butte County's channel maintenance programs. Regular debris removal is needed at this crossing; however, bridge modification or replacement to accommodate high flows and debris load would reduce the need for this practice. Adjacent open areas should be utilized for water storage during high flow events. To allow water to flow back to the main channel, a bypass under Cohasset Road should be established. Such improvements could be integrated into the Cohasset Road widening project.

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- **Flood Hazard - Rock Creek-Keefer Slough Split:** Gravel deposition at the Rock-Creek Keefer Slough Split.

**Mitigation - Flow Regulation and Channel Maintenance:** Flow regulating structures, as well as a channel maintenance program is needed to prevent large flows from being distributed to one channel, which damages the urban and agricultural downstream areas.

- **Flood Hazard - Rock Creek:** The lower reaches of Rock Creek and overflows from Rock Creek into Keefer Slough periodically inundate agricultural areas and the Town of Nord.

**Mitigation:** Flow regulating structures, as well as a channel maintenance program, is needed to prevent large flows from being distributed to one channel, which damages the urban and agricultural downstream areas.

- **Flood Hazard - Sacramento River:** Erosion of River Road in the stretch between West Sacramento Avenue and Big Chico Creek.

**Mitigation:** Upstream of the eroded spot in River Road, erosion in the Sacramento River is stabilized by riprap. The erosion begins at the end of the riprap. As a temporary solution, a concrete barrier has been constructed to prevent shoulder parking. Riprap upstream on the Sacramento River should continue downstream. To extend the riprap, permits and involvement from the Bureau of Land Management, USACOE, CDFG, and the Regional Water Quality Control Board would be required.

- **Flood Hazard - Butte Creek Levees:** According to the FEMA FIS and FIRMs, the water surface elevations under a 100-year and 500-year storm event would encroach on the levee freeboard and overtop part of the levees along Butte Creek. The Butte Creek levees were constructed in the 1950's and the condition of the levees at this time, with respect to structural integrity or seepage, is not known. Butte Creek contained a flow greater than the 100-year event, as published in the FEMA FIS, in 1997, confirming that the floodplain provided in the FEMA FIRMs from Butte Creek is largely due to theoretical levee failure. This method of floodplain determination near levees is adopted by FEMA for levees that are not certified. DWR is responsible for maintenance of the levees, funding is provided by County property owners through Maintenance Area 5. DWR is also responsible for channel maintenance, funding is provided by the State of California.

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**Mitigation - Conduct a Geotechnical Investigation and Update Hydrologic and Hydraulic Analyses:** To ensure the continuation of public safety and to determine the feasibility of certifying the Butte Creek levees, it is essential to determine the condition of the existing levees and foundations in the Butte Creek system. The condition of the levees can influence the method by which certification is ultimately achieved. Conduct a geotechnical study on the Butte Creek levee system to determine the extent to which reconstruction or modification would be made to obtain certification for the levees. Hydrologic and hydraulic analysis should be conducted on the Butte Creek levee system with new hydrographic surveys. This would be equivalent to an updated FEMA FIS. Provide continued and adequate State funding for channel maintenance.

- **Flood Hazard - Cherokee Canal:** Excessive sedimentation and debris accumulation in the Cherokee Canal clogs the channel and results in channel bank overtopping in high flow events. DWR is responsible for maintenance of the levees, funding is provided by County property owners through Maintenance Area 13. DWR is also responsible for channel maintenance, funding is provided by the State of California.

**Mitigation:** A regular channel maintenance and sedimentation removal program should be established. Provide continued and adequate State funding for channel maintenance.

- **Flood Hazard - Storage in the FEMA SFHA:** Butte County Rice Grower's Association Chemical Warehouse and the California Rice Experiment Station in the FEMA SFHA.

**Mitigation:** Floodwalls or ring levees could be constructed around the buildings/sites, to prevent inundation during high flows. The structures could also be elevated or flood proofed to prevent water seepage. These alternatives need to be properly reviewed and addressed in the Corps Feasibility Study.

- **Flood Hazard - Dry Creek:** High flows on the North and Middle Forks of Dry Creek exceed the channel capacity in the Oroville urban area. The Argonaut Detention Basin on the Middle Fork of Dry Creek fills up before the others in the system. Channel erosion in the tributaries of Dry Creek was evident through the developed areas in the City of Oroville.

**Mitigation - Detention Basin and Channel Inspection and Repair:** Increase the storage capacity of the Argonaut detention basin on the middle fork of Dry Creek and incorporate multi-objective management, such as converting the area to a recreational area.

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- **Flood Hazard -Dry Creek Tributaries Confluence:** Heavy development and excessive erosion near the confluence of the three main forks of Dry Creek, in the City of Oroville urban area.

**Mitigation - Detention Basin Installation and Expansion:** Install a detention basin near the intersection of Foothill Boulevard and Oro-Quincy Highway to control high flow and reduce the water volume and velocity.

- **Flood Hazard - Feather River:** Water rises through the gravel deposits in the Feather River Boulevard area, from Oro-Dam Boulevard to Georgia Pacific, to create equilibrium with the water surface elevation in the Feather River. Seepage occurs from the Feather River concrete channel adjacent to 4th Street and Safford Street.

**Mitigation - Floodwall:** Install a floodwall along the Feather River in the section adjacent to Feather River Blvd. The Feather River concrete channel, maintained and operated by the City of Oroville, should be inspected and repaired to prevent deterioration of the channel and potential losses due to significant seepage and flooding of the surrounding areas.

- **Flood Hazard - City of Oroville Stormwater Drainage:** Flooding in the urban area between the Feather River and the North Fork of the Dry Creek.

**Mitigation - Adjust Capacity and Operation of Pump Station, Increase Existing Storm Drain Lines, Increase Capacity of Outflow Lines, Install Pipe, and Adopt Regulations:** Increase the capacity and adjust the operation of the Huntoon Street pump station; increase the size of the existing storm drain lines in the Downtown area and increase capacity of outflow lines at the levee; install pipe under Highway 70 to the Feather River from the area west of Feather River Boulevard between Mitchell Avenue and Oro Dam Boulevard; and the City of Oroville should adopt regulations that requires no net increase and onsite storage by new development for storm events including and up to a 100-year event.

- **Flood Hazard - Wyman Ravine:** Houses flood near Wyman Ravine. Flooding occurs along Railroad Avenue due to overflow from the lower reach of Wyman Ravine.

**Mitigation - Detention Basin:** Add a detention basin on the Middle Fork of Wyman Ravine. Add detention basin on Wyman Ravine near Palermo.

- **Flood Hazard - Concow Creek and Cirby Creek:** Several private road crossings in the watershed do not have enough capacity to convey the flows, have signs of

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severe deterioration, and cannot handle heavy traffic, which would be expected during rescue and evacuation. The property owners are responsible for the maintenance of the roads and crossings.

**Mitigation - Re-Build Road Crossings:** Increase conveyance capacity of existing structures or rebuild severely deteriorated flow structures to convey flow, deflect debris, and have the capacity for potential heavy traffic. Structures of concern are: Concow Creek at Hoffman Road Bridge; Cirby Creek crossing at Cirby Creek Road; and the bridges in the Camelot subdivision, after Cirby Creek and Concow Creek join.

- **Flood Hazard - Vegetation in Little Chico Creek:** Reduced Little Chico Creek channel capacity due to excessive vegetation.

**Mitigation - Channel Maintenance Program:** The current channel capacity of Little Chico Creek is estimated at 1,800 cfs with the current vegetation levels, compared to 2,350 cfs in the FEMA FIS. Reducing the density of the vegetation would result in an increase in channel conveyance capacity. Channel maintenance responsibilities for the Butte Creek levee system and the Little Chico Creek channels are currently distributed between DWR's Maintenance Area No. 5 and the City of Chico. A vegetation clearing and channel maintenance program would increase the channel capacity of Little Chico Creek, facilitate interagency coordination, and initiate active participation from the public. The maintenance program could be developed with continued involvement from other local agencies, organizations, watershed groups, and the public.

- **Flood Hazard -Dead Horse Slough:** Inundation occurs at the Dead Horse Slough crossing at El Monte Avenue. The lower reach of Little Chico Creek has experienced levee seepage and overflow.

**Mitigation - Floodwall and Geotechnical Investigations:** A floodwall could be built on the left channel bank to protect the structures at the Music Camp, Bed and Breakfast, provided the project did not reduce the capacity of the system or elevate the flood plain on any other properties. Geotechnical, hydrologic and hydraulic investigations should be conducted to determine the extent of damage, needed repairs, and cost for raising the levees in the sections near the Little Chico Creek crossings at Taffee Avenue and at Alberton Avenue.

- **Flood Hazard - Drainage in Little Chico Creek:** Inadequate Storm Drainage System in the City of Chico results in excessive drainage and pollution into Little Chico Creek.

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**Mitigation - Revised Drainage Criteria:** The City of Chico Storm Drainage Master Plan should be revised with drainage criteria that accounts for new and future development and to detain/retain flows greater than the storm drain capacity in locations other than Little Chico Creek.

- **Flood Hazard - Uncertified Levee:** The levee along the Little Chico Creek-Butte Creek Diversion channel was constructed in 1957. The condition of the levee and its foundation are not known and it is not certified by the USACOE, thus the floodplain shown on the FEMA FIRM reflects an inadequate levee in relation to the out-of-bank flooding that can occur from Butte Creek.

**Mitigation - Conduct a Geotechnical Investigation/Levee Certification:** This mitigation measure is similar to that identified for the Butte Creek levees. The cost of levee certification depends upon the findings of the initial geotechnical investigations. The proposed mitigation is to conduct a preliminary geotechnical investigation of the levee for close to one mile of one bank. A prerequisite to pursuing this mitigation measure is the completion of an updated hydrologic and hydraulic analysis identified for Butte Creek, which includes the entire system (Butte Creek, Little Chico Creek-Butte Creek Diversion channel, and Little Chico Creek). Pending the results of this analysis and the above-mentioned structural integrity analysis of the levees, reconstruction or raising the existing levees could be considered.

- **Flood Hazard - Pine Creek and Singer Creek:** Excessive vegetation and sedimentation reduces channel capacity in Pine Creek and Singer Creek.

**Mitigation - Channel Maintenance and Sediment Removal Program:** A channel maintenance and sediment removal program should be developed and implemented to reduce the density of vegetation in the Pine Creek and Singer Creek channels. Channel maintenance responsibilities for the Pine Creek and Singer Creek channels are distributed among private landowners. A vegetation clearing and channel maintenance program should be implemented to increase the channel capacity of Pine Creek and Singer Creek. A state or local agency, such as DWR, NRCS, or Butte County, could sponsor the establishment and implementation of a channel maintenance program for Pine Creek and Singer Creek, which would include sediment removal. The maintenance and removal program should be developed with continued involvement from other local agencies, organizations, watershed groups, and the public.

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**City of Biggs**

Biggs does not have any FEMA identified flood hazard areas. The elevation of the city from 96+ feet above sea level in the northeast to 86+ feet above sea level near the westerly boundary of the City generally prevents water accumulation in depths that create dangerous flooding. However, the City of Biggs is subject to inundation if the Thermalito Afterbay levee or the Oroville Dam fails.

Flood Mitigation Goals, Policies and Programs of the City of Biggs include:

Goal 6.2 Minimize the risk of personal injury and property damage resulting from flooding.

Policy 6.2.A Develop flood control strategies and improvement plans for the City of Biggs in coordination with RD 833.

Policy 6.2.B New development shall not be approved in areas which are subject to flooding without prior review and approval of plans for improvements which provide a minimum flood protection level equal to the 100 year occurrence storm event.

Policy 6.2.C Development of structures must be in compliance with FEMA standards. All 100 year flood hazards must be completely mitigated through proper design.

Policy 6.2.D All new residential development shall be constructed on pads which are at least six inches above the top of curb of the street on which the development fronts.

Policy 6.2.E New development projects shall be designed to avoid increases in peak storm runoff levels entering RD 833 channels.

Program 6.2.1 Encourage the California Department of Water Resources to determine the maximum flow capacity for the Feather River and to identify portions of the Feather River levees, particularly in the vicinity of Hazelbush Levee, which are subject to failure or overtopping during periods of high water flow.

**City of Chico**

Flood Mitigation Policies of the City of Chico include:

S-G-1 Minimize threat to life and property from flooding and dam inundation.

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- S-I-1 As part of project review, ensure that structures subject to the 100-year flood provide adequate protection from flood hazards.
- S-I-2 When considering areas for future urban expansion ensure that impacts of flooding are adequately analyzed.
- S-I-3 In designing flood control facilities, consider the need to protect anadromous fisheries and allow for adequate water passage to ensure the survival of downstream riparian ecosystems.

**City of Gridley**

Following are the City of Gridley's General Plan Safety Goals, and Flood Safety Standards:

**Goals:**

1. Minimize the impact of hazards upon people and property by incorporation of safety considerations into the community development process.
2. Minimize the expansion or intensification of disasters once an event has occurred by insuring adequate community preparedness for rapid and efficient response.
3. Provide a reasonable safe habitat in which people may live, work or play.
4. Minimize loss of life and damage to property in the event of disaster.
5. Make existing structures as safe as possible.
6. Achieve the lowest possible community fire rating as fiscally possible for the City and its citizens.
7. Coordinate and augment area emergency response and mutual assistance agreements with neighboring cities, Butte County and the State of California.
8. Support reasonable County, State and Federal efforts, plans and programs for disaster prevention and response.

**Standards:**

1. Require that all habitable structures that would lie within the 100 year floodplain of the Feather River to be constructed so that any inhabitants would be protected to a level above the 100 year flood elevation; and any utilities serving such structures will be able to withstand inundation.

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**City of Oroville**

Following are the City of Oroville's Flooding Objectives and Implementing Policies:

**Objectives: Drainage and Flooding**

- 8.20a Continue to protect lives and property and ensure that structures existing and proposed, for sites located within flood plains are provided adequate protection from flood damage and hazards.
- 8.20b Preserve as open space those areas that cannot be protected from flood hazard.
- 8.20c Support a multi-use concept of flood plains, flood-related facilities, and waterways, including, where appropriate, the following uses:
- Flood control
  - Groundwater recharge
  - Water quality preservation
  - Mineral extraction
  - Open space
  - Agriculture
  - Nature study
  - Habitat preservation
  - Pedestrian, equestrian, and bicycle circulation
  - Outdoor sports and recreation
- 8.20d Where feasible given flood control requirements, maintain the natural condition of waterways and flood plains to ensure adequate groundwater recharge and water quality, preservation of habitat, and access to mineral resources.
- 8.20e Support the intent of Butte County's flood control policies as specified in the Draft Energy, Natural Resources, and Recreation Element.
- 8.20f Cooperate with all affected or interested public and private agencies involved to ensure that flood control improvements do not result in unacceptable degradation of environmentally sensitive areas.

**Implementing Policies: Drainage and Flooding**

- 8.20g Coordinate and maintain the existing Master Drainage Plan(s), organized by drainage basin, rather than by project or jurisdiction, for the entire Planning Area based on build-out of the General Plan.
- 8.20h For drainage basins not subject to prior study, prepare a drainage study for incorporation into the City's Master Drainage Plan. Master drainage plans shall be offered for peer review prior to review and approval by the City Council.

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- 8.20i Use the appropriate City drainage plan to determine whether to require storm drainage analysis for projects within the Planning Area, and, if necessary, make storm drainage improvements a condition of development approval.
- 8.20j Require that developers pay their fair share for construction of off-site drainage improvements, where necessary as determined by the appropriate City drainage plan.
- 8.20k Reduce the effects of surface runoff in developing areas by the use of extensive landscaping with an emphasis on native and drought-resistant species, minimizing impervious surfaces, and providing for recharge.
- 8.20l Prior to project approval in the vicinity of a waterway or drainage course, consult Flood Insurance Rate Maps on file with the Planning Department to identify areas that have not been subject to detailed study; if the project falls within an area that has not been studied, require studies and, if necessary, require mitigation or restrictions on development.
- 8.20m Identify critical facilities in flood hazard areas and within the Oroville Dam inundation area, and seek ways to improve their level of protection, if possible.
- 8.20n Encourage timely FEMA map changes and annually incorporate mapped revisions to the 100-year flood zone into City hazards maps.
- 8.20o In the event of dam failure on the Oroville Dam, implement emergency measures consistent with the City's Multi-Hazard Functional Disaster Plan.

**Town of Paradise**

Flood Mitigation Policies and Implementation measures of the Town of Paradise include:

- SP-9 The town should assure that increased runoff resulting from additional coverage of surface area on developing properties does not adversely affect surrounding properties, roads or stream courses.
- SP-10 The town shall attempt to assure that no new structures are located within potential floodways.
- SP-11 Development should not be permitted if identified or potential flooding and drainage impacts cannot be overcome by sound engineering practices.

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- SP-12 All new development should comply with the procedures and regulations of the Master Storm Drain Study and Facilities Plan.
  
- SI-9 Constantly re-evaluate and continue to implement the Master Storm Drain Study and Facilities Plan.

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**Hazard: Earthquake**

**Jurisdictions Affected by Earthquake**

<b>Butte County Probability: Low</b>	<b>Butte County Severity: Low to Medium</b>
<b>Biggs Probability: Low</b>	<b>Biggs Severity: Low</b>
<b>Chico Probability: Low</b>	<b>Chico Severity: Low</b>
<b>Gridley Probability: Low</b>	<b>Gridley Severity: Low to High</b>
<b>Oroville Probability: Low</b>	<b>Oroville Severity: Low</b>
<b>Paradise Probability: Low</b>	<b>Paradise Severity: Low</b>

**Hazard Definition**

An earthquake is a sudden, rapid shaking of the ground caused by the breaking and shifting of rock beneath the Earth's surface. For hundreds of millions of years, the forces of plate tectonics have shaped the Earth as the huge plates that form the Earth's surface move slowly over, under, and past each other. Sometimes the movement is gradual. At other times, the plates are locked together, unable to release the accumulating energy. When the accumulated energy grows strong enough, the plates break free causing the ground to shake. Most earthquakes occur at the boundaries where the plates meet; however, some earthquakes occur in the middle of plates.

The major form of direct damage from most earthquakes is damage to construction. Bridges are particularly vulnerable to collapse, and dam failure may generate major downstream flooding. Buildings vary in susceptibility, dependent upon construction and the types of soils on which they are built. Earthquakes destroy power and telephone lines; gas, sewer, or water mains; which, in turn, may set off fires and/or hinder firefighting or rescue efforts. The hazard of earthquakes varies from place to place, dependent upon the regional and local geology. Ground shaking may occur in areas 65 miles or more from the epicenter (the point on the ground surface above the focus).

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Ground shaking can change the mechanical properties of some fine grained, saturated soils, whereupon they liquefy and act as a fluid (liquefaction).

Where earthquakes have struck before, they will strike again. Earthquakes strike suddenly, without warning. Earthquakes can occur at any time of the year and at any time of the day or night.

Ground movement during an earthquake is seldom the direct cause of death or injury. Most earthquake-related injuries result from collapsing walls, flying glass, and falling objects as a result of the ground shaking, or people trying to move more than a few feet during the shaking. Much of the damage in earthquakes is predictable and preventable.

With increasing magnitude (i.e., larger earthquakes) ground motions are stronger, last longer, and are felt over larger areas. Earthquake “intensity” refers to the effects of earthquake ground motions on people and buildings. Earthquake intensity is often more useful than magnitude when discussing the damaging effects of earthquakes. The most common intensity scale is the Modified Mercalli Intensity (MMI) scale, which ranges from I to XII.

### **History**

The Seismic Hazards Mapping Program of the California Geological Survey categorizes all of Butte County as a “seismic hazard zone” since the entire County is subject to earthquakes of Modified Mercalli Intensity scale VIII. The Oroville earthquake of 1975 is the only earthquake of this intensity recorded in Butte County. The earthquake resulted in structural damage, partial destruction of some buildings, fires and numerous injuries.

Seismic risk in Butte County results from earthquake faults within the County, as well as from faults outside the County whose seismic activity would cause potentially damaging ground motion in the County. The Sierra foothills contain literally hundreds of mapped faults, dozens of which are located within Butte County. Most of these faults are not now considered active. Furthermore, most of these faults are very short and thus are probably not capable of producing severely damaging earthquakes.

The California Mining and Geology Board has defined active faults as those for which there is evidence of surface displacement within the Quaternary period (within about the last 1.6 million years). Faults classified as potentially active faults show no evidence of surface displacements within the past 11,000 years, but this period of time is short geologically and thus such faults are considered potentially active. It is important to keep in mind that faults that do not meet the California Mining and Geology Board’s criteria are not necessarily permanently inactive. Many damaging California earthquakes,

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including the 1975 Oroville earthquake, the 1983 Coalinga earthquake, and the 1987 Whittier Narrows earthquake occurred on faults not previously recognized as active.

After the 1975 Oroville earthquake, geologists reevaluated the earthquake hazard in the Sierra foothills region, including Butte County. It is now generally accepted that earthquakes of magnitude 6.0 or 6.5 are possible anywhere in the foothills and near the margins of the Sacramento Valley, including Butte County. The possibility of such earthquakes along the Chico Monocline fault, in the Coast Ranges thrust zone, and along several faults in the Sierra foothills cannot be excluded from consideration. Earthquakes as large as magnitude 7.0 in these areas would produce major damage in Butte County. Such events would probably result in MMI of IX or X in Butte County and could result in collapses of unreinforced masonry buildings, with substantial numbers of casualties.

The only known active fault in Butte County is the Cleveland Hills Fault south of Oroville, the site of the August 1975 Oroville earthquake. This earthquake had a Richter magnitude of 5.7. Prior to the 1975 earthquake this fault had not been considered active. Reports by the California Division of Mines and Geology indicate that the ground motion at Gridley was approximately 0.1 times acceleration of gravity. Similar motion was experienced in Oroville and resulted in considerable structural damage in Oroville. This earthquake was also felt in Chico, but there was no recorded damage. Studies indicate that this fault could have a maximum credible earthquake of 6.5 to 6.7 Richter.

**Potentially Active Faults in Butte County**

There are a number of faults within Butte County and a large number of relatively nearby faults that could be considered potentially active, based either on the fairly restrictive criteria developed by the California Mining and Geology Board. Following is a description of the active faults in or near Butte County and the potential affect they have on the County.

**Cleveland Hills Fault.** As of 2003 there is only one identified active fault located within Butte County - the Cleveland Hills fault. The State Geologist has mapped and studied it since 1977. It is subject to the Alquist-Priolo Act and is identified pursuant to AB6x as an “earthquake fault zone.” This fault was responsible for the 1975 Oroville earthquake of Richter magnitude 5.7, an event that produced surface displacement along about 2.2 miles of the fault. Ground motions corresponding to MMI VIII were experienced at Gridley and Oroville. Significant structural damage occurred to unreinforced masonry buildings in Oroville. Geologic studies indicate that the total length of the Cleveland Hills fault is probably 11 to 15 miles. The maximum credible earthquake on this fault is probably about magnitude 6.5 to 6.7. An event of this magnitude would cause substantially more damage than the 1975 event.

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**Big Bend Fault.** Some geologists consider the Big Bend fault zone potentially active. This fault could produce a magnitude 7.0 earthquake with MMI of IX or X in Butte County. Intensities this high would result in major damage.

**Foothills Shear Zone.** The Foothills shear zone extends into southern Butte County. A possible magnitude 7.0 earthquake in this zone would result in intensities as high as IX in Butte County.

**Chico Monocline Fault.** The Chico Monocline fault which extends northwesterly from Chico was considered potentially active in an unpublished 1988 report by the California Geological Survey. Based on its length, this fault could produce at least a magnitude 7.0 earthquake which would cause major damage in Chico and elsewhere in Butte County.

**Willows Fault.** West of Butte County is the 40-mile long Willows fault which could produce a Magnitude 7 earthquake and could yield a MMI as high as VIII in Butte County (comparable to the intensity experienced during the 1975 Oroville earthquake).

**Coast Ranges Thrust Zone.** The Coast Ranges Thrust Zone is approximately 35 miles west of Butte County. This fault zone could potentially produce a magnitude 8.0 earthquake which could be experienced in Butte County as MMI IX or X. An event of this magnitude would cause major damage to Butte County.

**San Andreas Fault System.** The San Andreas fault, along with related faults such as the Hayward and Calaveras faults, is one of the most active faults in California. Total displacement along this fault has been at least 450 miles and could possibly be as much as 750 miles. This fault system was responsible for the magnitude 8.0 San Francisco earthquake of 1906 as well as numerous other damaging earthquakes, including the 1989 Loma Prieta earthquake. At its nearest point, the San Andreas fault is about 95 miles west of Butte County. The 1906 earthquake was strongly felt in Butte County, at approximately MMI V and VI in western Butte County and IV to V in eastern Butte County, but there was little damage.

**Hayward-Calaveras Fault.** The Hayward-Calaveras fault complex is considered to be a branch of the San Andreas fault. An 1868 earthquake is reported to have caused strong fluctuations in the water level in the Sacramento River near Sacramento and in a slough near Stockton.

**Midland-Sweitzer Fault.** The 80-long Midland-Sweitzer fault lies approximately 40 miles southwest of Butte County. Historically, earthquakes of Richter magnitudes between 6.0 and 6.9 have occurred on or near this fault, including two strong earthquakes in 1892. Based on the fault length and the historic activity, this fault is capable of

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producing a magnitude 7.0 earthquake which would be experienced in Butte County with MMI as high as VIII or IX.

**Eastern Sierra Faults/ Russell Valley Fault.** The Eastern Sierra contain a number of active faults including the Russell Valley fault, which produced the 1966 Truckee earthquake of magnitude approximately 6.0, and several faults in the Last Chance and Honey Lake fault zones, which have produced several magnitude 5.0 to 5.9 earthquakes. These fault zones are approximately 50 miles east of Butte County. Earthquakes on these faults could be experienced in Butte County with MMI as high as VII or VIII.

**Last Chance-Honey Lake Fault Zones.** The Last Chance-Honey Lake fault zones are approximately 100 miles long and trend north-northwest along the California-Nevada border. These faults are active and have resulted in earthquakes ranging between 5 and 5.9 Richter.

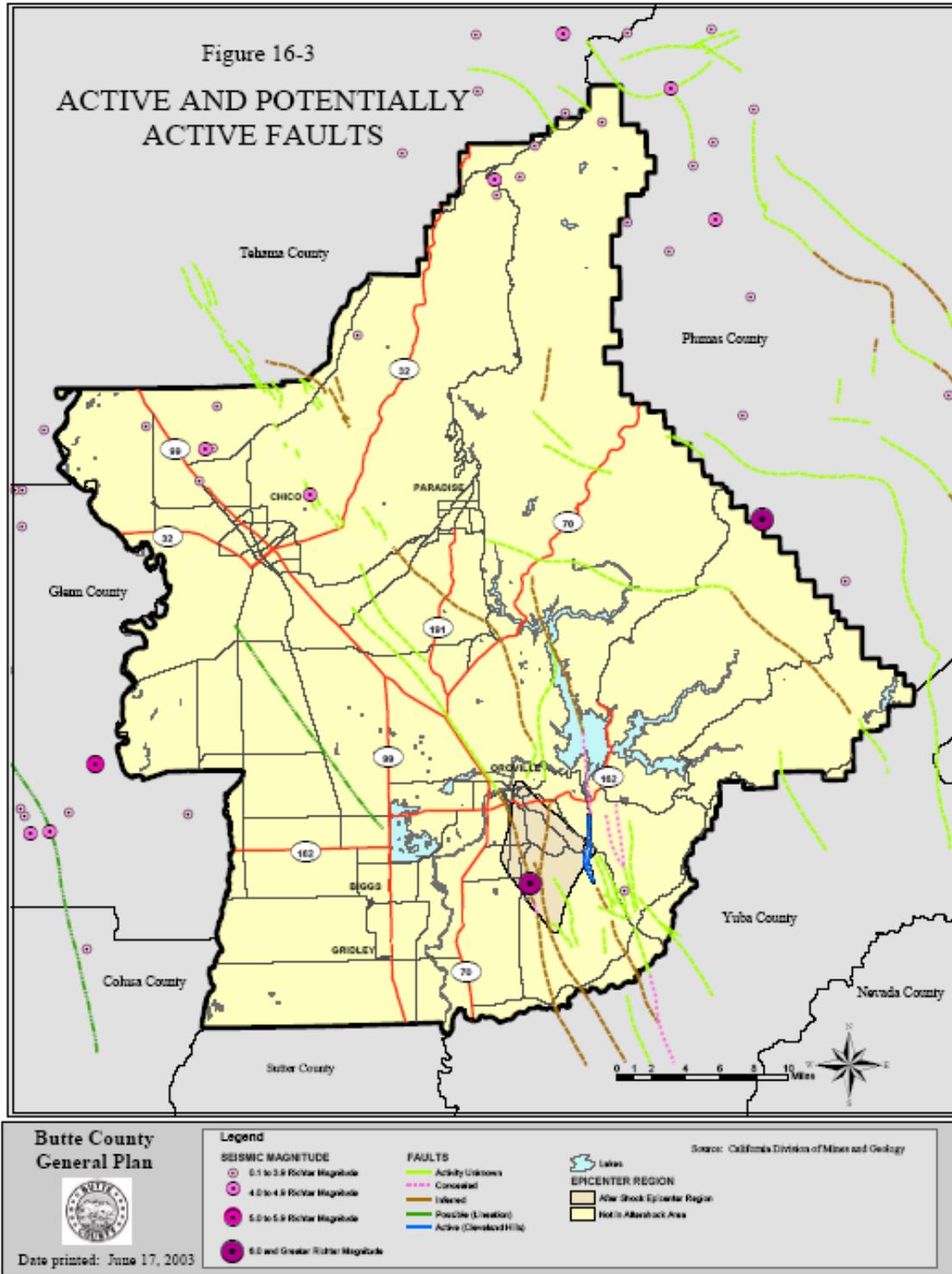
**Other Potentially Active Faults**

Other potentially active faults which could result in significant ground motion in Butte County include the Sutter Butte faults, Dunnigan fault, Camel's Peak fault, Melones-Dogwood Peak faults and the Hawkins Valley fault. All of these faults should be considered potentially active due to geologic, historic, or seismic data. Other potentially active faults may also exist within the County.

The following map depicts known faults in or near Butte County.

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**Risk Assessment**

The Seismic Hazards Mapping Program of the California Geological Survey categorizes Butte County as a seismic hazard zone. Seismic risk in Butte County results from earthquake faults within the County as well as from faults outside the County whose seismic activity would cause potentially damaging ground motion in the County. In the event of an earthquake, the location of the epicenter as well as the time of day and season of the year would have a profound effect on the number of death, casualties, property damage, agricultural and environmental damage, and disruption of normal government and community services and activities. The effects could be aggravated by collateral emergencies such as fires, flooding, hazardous material spills, utility disruptions, landslides and transportation emergencies.

- **Effects on people and housing.** In any earthquake, the primary consideration is saving lives. Time and effort must also be dedicated to providing for mental health by reuniting families, providing shelter to displaced persons, and restoring basic needs and services. Major efforts will be required to remove debris and clear roadways, demolish unsafe structures, assist in reestablishing public services and utilities, and provide continuing care and temporary housing for affected citizens.

Unreinforced masonry structures perform poorly under almost all earthquake conditions, and especially if located on poor ground areas. Nearby relatively small earthquakes can be very damaging because of the sharp motions they generate. Distant events, while more damaging to taller buildings, can also damage unreinforced masonry buildings because of the stresses caused by long-period motions.

Evidence from past earthquakes shows that wood frame structures properly tied to their foundations perform very well, or if badly damaged cause few injuries and life loss even if located in poor ground areas. Older wood frame structures that have stone, brick, or cripple wall foundations, or that are not bolted to their foundations, do not perform well. Mobile homes generally perform very well because of their lightness, but failures of their weak foundation supports (usually flimsy metal stands or concrete blocks) can produce serious damage and economic losses. Older mobile homes are also considered serious fire hazards because of the non-fire resistant wall paneling and other materials.

- **Effects on commercial and industrial structures.** After any earthquake, individuals are likely to lose wages due to the inability of businesses to function because of damaged goods and/or facilities. With business losses, the County of

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Butte and the cities in Butte County will lose revenue. Economic recovery from even a minor earthquake will be critical to the communities involved.

- **Effects on infrastructure.** The damage caused by both ground breaking and ground shaking can lead to the paralysis of the local infrastructure: police, fire, medical and governmental services.

**Risk assessment conclusion.** Butte County is located in a seismic hazard zone as identified by the Seismic Hazards Mapping Program of the California Geological Survey, since the entire County is subject to earthquakes of Modified Mercalli Intensity scale VIII. A significant fraction of small to moderately large earthquakes occurs on faults that were not previously recognized. Such earthquakes are characterized as “background seismicity” or “floating earthquakes”, terms that indicate that the expected sources and locations of such earthquakes are often unknown. Based on this concept, the general geologic setting of Butte County, and earthquake experience elsewhere in the Sierra Foothills and Central Valley, it appears reasonable to assume that background seismicity could produce earthquakes as large as Richter magnitude 6.0 or 6.5 virtually anywhere in Butte County.

**Relationship to Other Hazards – Cascading Effects**

Earthquakes can cause many cascading effects such as fires, flooding, hazardous material spills, utility disruptions, landslides, transportation emergencies, and the possible failure of several dams in Butte County.

Based on the known active faults and on the large number of potentially active faults, all parts of Butte County are potentially subject to moderately strong ground shaking. Conservatively, ground motions as strong as those observed in Oroville during the 1975 earthquake (MMI VIII) can be expected anywhere in Butte County. More conservatively, ground motions with intensities as high as X could occur from magnitude 7.0 earthquakes on the Chico Monocline Fault, the Big Bend Fault, or the Foothills Shear zone. Similar intensities could be experienced in Butte County from larger earthquakes on more distant faults such as the Coast Ranges thrust zone or Melones fault zone.

Liquefaction, which may occur under strong ground shaking during earthquakes, is the transformation of granular sediment or fill material from a solid state to a temporarily liquid state. Areas paralleling the Sacramento River that contain clean sand layers with low relative densities are estimated to have generally high liquefaction potential. Granular layers underlying most of the remaining Sacramento Valley area of Butte County have higher relative densities and thus have moderate liquefaction potential. Clean layers of granular materials older than Holocene are of higher relative densities and are thus of low liquefaction potential. Areas of bedrock, including most of eastern Butte

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County have no liquefaction potential, although localized areas of valley fill alluvium can have moderate to high liquefaction potential.

A seiche is a periodic oscillation of a body of water such as a reservoir, river, lake, harbor or bay resulting from seismic shaking or other causes such as landslides into a body of water. Seiches have not been recorded in any of the reservoirs in Butte County that are within the jurisdiction of the California Division of Dam Safety. However, the potential for seiches does exist in Butte County, either from landslides or from stronger earthquakes than have been experienced in historical times.

**HAZUS Analysis**

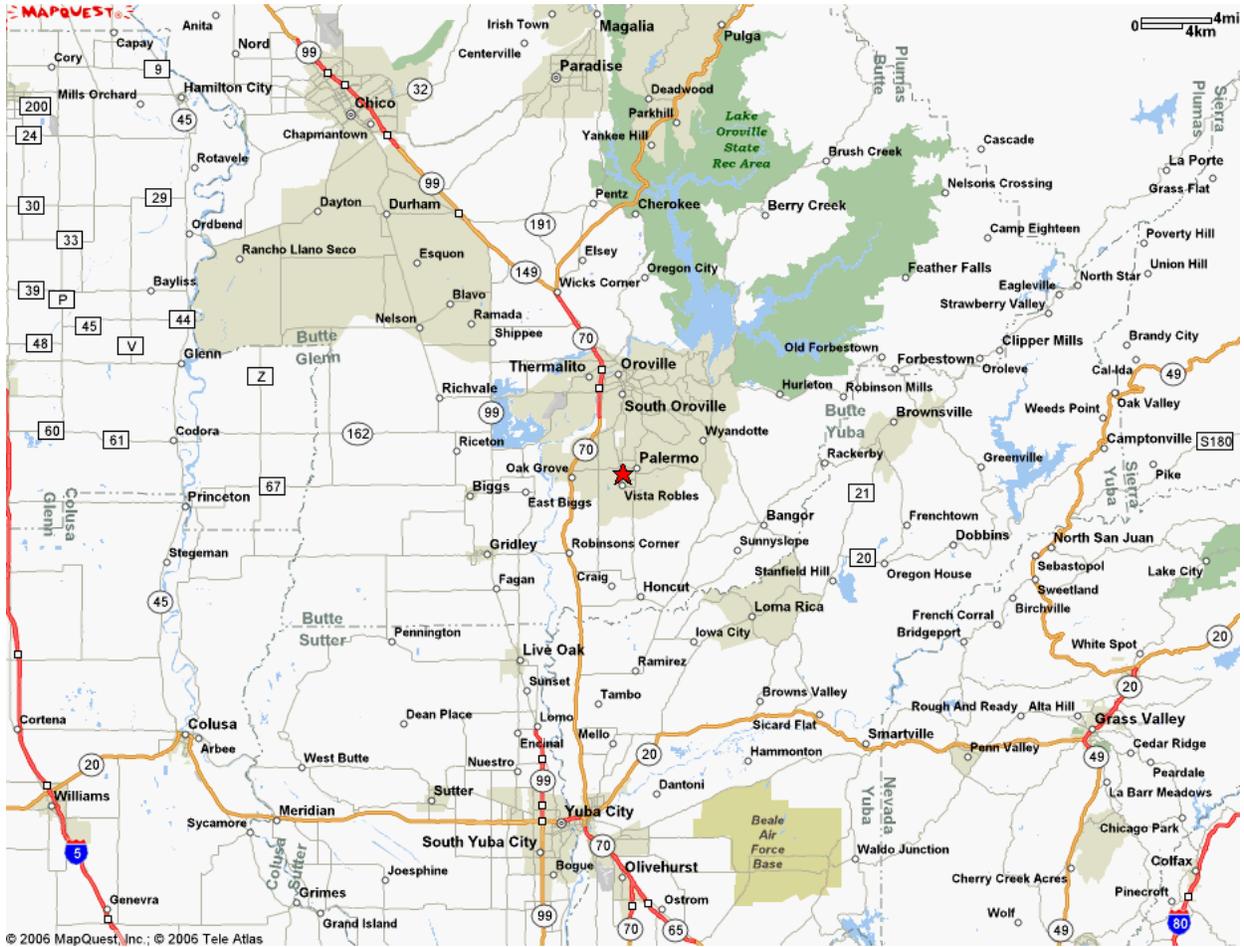
As part of the development of this MHMP, an earthquake scenario was created in HAZUS-MH, the FEMA-approved software program for estimating potential losses from disasters.

For the HAZUS Analysis scenario, a magnitude 5.7 earthquake on the Cleveland Fault (Foothills Fault System) with an epicenter at 39.43 Latitude, -121.55 Longitudes and 8.42 miles below the surface was simulated replicating the historical 8:20 p.m. 1975 earthquake.

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The following Map indicates the HAZUS analysis earthquake epicenter.



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The results produced by HAZUS are reported by census tract. The Loss Estimates are stated in \$thousands. The summarized results for Butte County are presented on the pages immediately following.

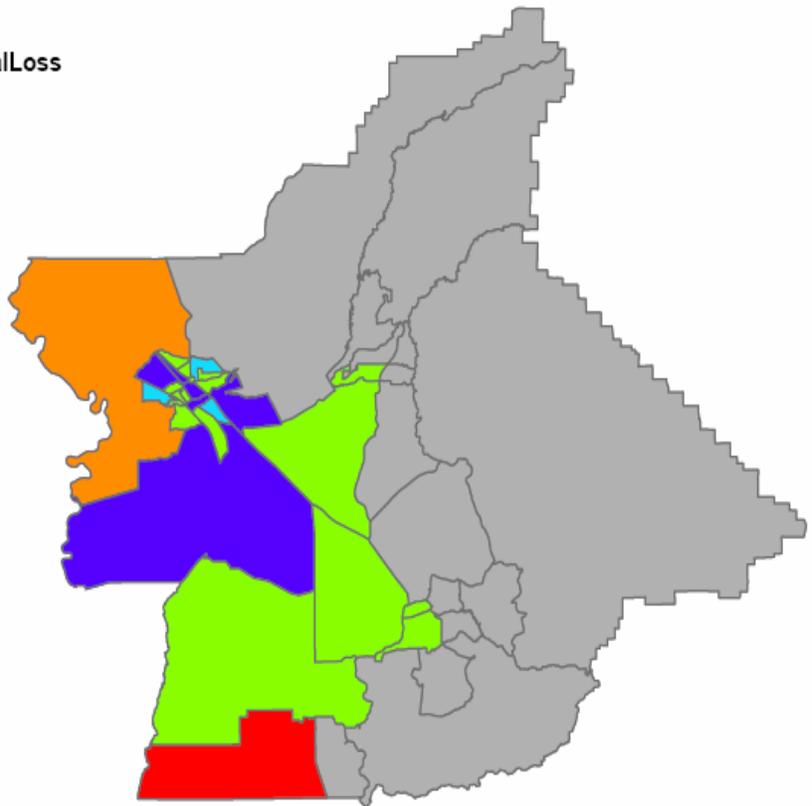
Study Region : Butte County  
Hazard Scenario : Cleveland Fault (Foothills Fault System)

**Legend**

**EqTractThMap\_RES\_DEL\_TOTAL\_TotalLoss**

**RES\_DEL\_TOTAL\_TotalLoss**

- 0 - 54
- 54 - 108
- 108 - 162
- 162 - 216
- 216 - 270
- 270 - 326



(c) 1997-2003 FEMA.

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<b>SUMMARIZED HAZUS RESULTS: HAZUS Analysis</b>	
<b>Jurisdiction: Butte County</b>	
<b>Scenario: Cleveland Fault (Foothills Fault System) Earthquake 5.7</b>	
<b>Direct Economic Loss Estimates (thousands of \$)</b>	
Structural Damage	\$ 433.77
Non-Structural Damage	\$ 1,333.73
Total Loss	\$ 1,767.50
<b>Bridge Functionality</b>	
Day 1	99.9
Day 3	99.9
Day 7	99.9
Day 14	99.9
<b>Bridge Damage</b>	
None	1.000
Slight	0.000
Moderate	0.000
Extensive	0.000
Completely Destroyed	0.000
<b>Fire Station Functionality</b>	
Day 1	99.5
Day 3	99.5
Day 7	99.9
Day 14	99.9
<b>Fire Station Structural Damage</b>	
None	0.995
Slight	0.004
Moderate	0.001
Extensive	0.000
Completely Destroyed	0.000
<b>Police Station Functionality</b>	
Day 1	99.5
Day 3	99.5
Day 7	99.9
Day 14	99.9
<b>Police Station Structural Damage</b>	
None	0.995
Slight	0.004
Moderate	0.001
Extensive	0.000
Completely Destroyed	0.000

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<b>Commercial Casualties for Evening Event</b>	
Medical Aid	0.713
Hospital Treatment	0.067
Life-Threatening Severity	0.000
Death	0.000
<b>Commuting Casualties for Evening Event</b>	
Medical Aid	0.000
Hospital Treatment	0.000
Life-Threatening Severity	0.000
Death	0.000
<b>Educational Casualties for Evening Event</b>	
Medical Aid	0.039
Hospital Treatment	0.001
Life-Threatening Severity	0.000
Death	0.000
<b>Hotels Casualties for Evening Event</b>	
Medical Aid	0.000
Hospital Treatment	0.000
Life-Threatening Severity	0.000
Death	0.000
<b>Industrial Casualties for Evening Event</b>	
Medical Aid	0.039
Hospital Treatment	0.001
Life-Threatening Severity	0.000
Death	0.000
<b>Other Residential Casualties for Evening Event</b>	
Medical Aid	0.339
Hospital Treatment	0.024
Life-Threatening Severity	0.000
Death	0.000
<b>Single Family Casualties for Evening Event</b>	
Medical Aid	0.097
Hospital Treatment	0.001
Life-Threatening Severity	0.000
Death	0.000
<b>Total Casualties for Evening Event</b>	
Medical Aid	1.227
Hospital Treatment	0.094
Life-Threatening Severity	0.000
Death	0.000

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<b>SUMMARIZED HAZUS RESULTS: HAZUS Analysis</b>	
<b>Jurisdiction: City of Biggs</b>	
<b>Scenario: Cleveland Fault (Foothills Fault System) Earthquake 5.7</b>	
<b>Direct Economic Loss Estimates (thousands of \$)</b>	
Structural Damage	\$ 15.04
Non-Structural Damage	\$ 59.43
Total Loss	\$ 74.47
<b>Bridge Functionality</b>	
Day 1	99.9
Day 3	99.9
Day 7	99.9
Day 14	99.9
<b>Bridge Damage</b>	
None	1.000
Slight	0.000
Moderate	0.000
Extensive	0.000
Completely Destroyed	0.000
<b>Fire Station Functionality</b>	
Day 1	99.2
Day 3	99.3
Day 7	99.9
Day 14	99.9
<b>Fire Station Structural Damage</b>	
None	0.993
Slight	0.006
Moderate	0.001
Extensive	0.000
Completely Destroyed	0.000
<b>Police Station Functionality</b>	
Day 1	99.2
Day 3	99.3
Day 7	99.9
Day 14	99.9
<b>Police Station Structural Damage</b>	
None	0.993
Slight	0.007
Moderate	0.001
Extensive	0.000
Completely Destroyed	0.000

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<b>Commercial Casualties for Evening Event</b>	
Medical Aid	0.012
Hospital Treatment	0.001
Life-Threatening Severity	0.000
Death	0.000
<b>Commuting Casualties for Evening Event</b>	
Medical Aid	0.000
Hospital Treatment	0.000
Life-Threatening Severity	0.000
Death	0.000
<b>Educational Casualties for Evening Event</b>	
Medical Aid	0.001
Hospital Treatment	0.000
Life-Threatening Severity	0.000
Death	0.000
<b>Hotels Casualties for Evening Event</b>	
Medical Aid	0.000
Hospital Treatment	0.000
Life-Threatening Severity	0.000
Death	0.000
<b>Industrial Casualties for Evening Event</b>	
Medical Aid	0.000
Hospital Treatment	0.000
Life-Threatening Severity	0.000
Death	0.000
<b>Other Residential Casualties for Evening Event</b>	
Medical Aid	0.006
Hospital Treatment	0.001
Life-Threatening Severity	0.000
Death	0.000
<b>Single Family Casualties for Evening Event</b>	
Medical Aid	0.004
Hospital Treatment	0.000
Life-Threatening Severity	0.000
Death	0.000
<b>Total Casualties for Evening Event</b>	
Medical Aid	0.023
Hospital Treatment	0.002
Life-Threatening Severity	0.000
Death	0.000

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<b>SUMMARIZED HAZUS RESULTS: HAZUS Analysis</b>	
<b>Jurisdiction: City of Chico</b>	
<b>Scenario: Cleveland Fault (Foothills Fault System) Earthquake 5.7</b>	
<b>Direct Economic Loss Estimates (thousands of \$)</b>	
Structural Damage	\$ 497.25
Non-Structural Damage	\$ 1,274.50
Total Loss	\$ 1,771.75
<b>Bridge Functionality</b>	
Day 1	99.9
Day 3	99.9
Day 7	99.9
Day 14	99.9
<b>Bridge Damage</b>	
None	1.000
Slight	0.000
Moderate	0.000
Extensive	0.000
Completely Destroyed	0.000
<b>Fire Station Functionality</b>	
Day 1	99.3
Day 3	99.3
Day 7	99.9
Day 14	99.9
<b>Fire Station Structural Damage</b>	
None	0.993
Slight	0.006
Moderate	0.001
Extensive	0.000
Completely Destroyed	0.000
<b>Police Station Functionality</b>	
Day 1	99.3
Day 3	99.3
Day 7	99.9
Day 14	99.9
<b>Police Station Structural Damage</b>	
None	0.993
Slight	0.006
Moderate	0.001
Extensive	0.000
Completely Destroyed	0.000

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<b>Commercial Casualties for Evening Event</b>	
Medical Aid	0.489
Hospital Treatment	0.047
Life-Threatening Severity	0.000
Death	0.000
<b>Commuting Casualties for Evening Event</b>	
Medical Aid	0.000
Hospital Treatment	0.000
Life-Threatening Severity	0.000
Death	0.000
<b>Educational Casualties for Evening Event</b>	
Medical Aid	0.035
Hospital Treatment	0.001
Life-Threatening Severity	0.000
Death	0.000
<b>Hotels Casualties for Evening Event</b>	
Medical Aid	0.000
Hospital Treatment	0.000
Life-Threatening Severity	0.000
Death	0.000
<b>Industrial Casualties for Evening Event</b>	
Medical Aid	0.028
Hospital Treatment	0.001
Life-Threatening Severity	0.000
Death	0.000
<b>Other Residential Casualties for Evening Event</b>	
Medical Aid	0.186
Hospital Treatment	0.013
Life-Threatening Severity	0.000
Death	0.000
<b>Single Family Casualties for Evening Event</b>	
Medical Aid	0.054
Hospital Treatment	0.000
Life-Threatening Severity	0.000
Death	0.000
<b>Total Casualties for Evening Event</b>	
Medical Aid	0.792
Hospital Treatment	0.062
Life-Threatening Severity	0.000
Death	0.000

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<b>SUMMARIZED HAZUS RESULTS: HAZUS Analysis</b>	
<b>Jurisdiction: City of Gridley</b>	
<b>Scenario: Cleveland Fault (Foothills Fault System) Earthquake 5.7</b>	
<b>Direct Economic Loss Estimates (thousands of \$)</b>	
Structural Damage	\$ 57.53
Non-Structural Damage	\$ 193.62
Total Loss	\$ 251.15
<b>Bridge Functionality</b>	
Day 1	99.9
Day 3	99.9
Day 7	99.9
Day 14	99.9
<b>Bridge Damage</b>	
None	1.000
Slight	0.000
Moderate	0.000
Extensive	0.000
Completely Destroyed	0.000
<b>Fire Station Functionality</b>	
Day 1	99.3
Day 3	99.3
Day 7	99.9
Day 14	99.9
<b>Fire Station Structural Damage</b>	
None	0.993
Slight	0.006
Moderate	0.001
Extensive	0.000
Completely Destroyed	0.000
<b>Police Station Functionality</b>	
Day 1	99.2
Day 3	99.2
Day 7	99.9
Day 14	99.9
<b>Police Station Structural Damage</b>	
None	0.993
Slight	0.007
Moderate	0.001
Extensive	0.000
Completely Destroyed	0.000

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<b>Commercial Casualties for Evening Event</b>	
Medical Aid	0.048
Hospital Treatment	0.005
Life-Threatening Severity	0.000
Death	0.000
<b>Commuting Casualties for Evening Event</b>	
Medical Aid	0.000
Hospital Treatment	0.000
Life-Threatening Severity	0.000
Death	0.000
<b>Educational Casualties for Evening Event</b>	
Medical Aid	0.001
Hospital Treatment	0.000
Life-Threatening Severity	0.000
Death	0.000
<b>Hotels Casualties for Evening Event</b>	
Medical Aid	0.000
Hospital Treatment	0.000
Life-Threatening Severity	0.000
Death	0.000
<b>Industrial Casualties for Evening Event</b>	
Medical Aid	0.002
Hospital Treatment	0.000
Life-Threatening Severity	0.000
Death	0.000
<b>Other Residential Casualties for Evening Event</b>	
Medical Aid	0.019
Hospital Treatment	0.001
Life-Threatening Severity	0.000
Death	0.000
<b>Single Family Casualties for Evening Event</b>	
Medical Aid	0.012
Hospital Treatment	0.001
Life-Threatening Severity	0.000
Death	0.000
<b>Total Casualties for Evening Event</b>	
Medical Aid	0.082
Hospital Treatment	0.007
Life-Threatening Severity	0.000
Death	0.000

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<b>SUMMARIZED HAZUS RESULTS: HAZUS Analysis</b>	
<b>Jurisdiction: City of Oroville</b>	
<b>Scenario: Cleveland Fault (Foothills Fault System) Earthquake 5.7</b>	
<b>Direct Economic Loss Estimates (thousands of \$)</b>	
Structural Damage	\$ 71.08
Non-Structural Damage	\$ 182.05
Total Loss	\$ 253.13
<b>Bridge Functionality</b>	
Day 1	99.9
Day 3	99.9
Day 7	99.9
Day 14	99.9
<b>Bridge Damage</b>	
None	1.000
Slight	0.000
Moderate	0.000
Extensive	0.000
Completely Destroyed	0.000
<b>Fire Station Functionality</b>	
Day 1	99.7
Day 3	99.7
Day 7	99.9
Day 14	99.9
<b>Fire Station Structural Damage</b>	
None	0.998
Slight	0.002
Moderate	0.000
Extensive	0.000
Completely Destroyed	0.000
<b>Police Station Functionality</b>	
Day 1	99.7
Day 3	99.7
Day 7	99.9
Day 14	99.9
<b>Police Station Structural Damage</b>	
None	0.998
Slight	0.002
Moderate	0.000
Extensive	0.000
Completely Destroyed	0.000

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<b>Commercial Casualties for Evening Event</b>	
Medical Aid	0.085
Hospital Treatment	0.006
Life-Threatening Severity	0.000
Death	0.000
<b>Commuting Casualties for Evening Event</b>	
Medical Aid	0.000
Hospital Treatment	0.000
Life-Threatening Severity	0.000
Death	0.000
<b>Educational Casualties for Evening Event</b>	
Medical Aid	0.000
Hospital Treatment	0.000
Life-Threatening Severity	0.000
Death	0.000
<b>Hotels Casualties for Evening Event</b>	
Medical Aid	0.000
Hospital Treatment	0.000
Life-Threatening Severity	0.000
Death	0.000
<b>Industrial Casualties for Evening Event</b>	
Medical Aid	0.003
Hospital Treatment	0.000
Life-Threatening Severity	0.000
Death	0.000
<b>Other Residential Casualties for Evening Event</b>	
Medical Aid	0.072
Hospital Treatment	0.005
Life-Threatening Severity	0.000
Death	0.000
<b>Single Family Casualties for Evening Event</b>	
Medical Aid	0.015
Hospital Treatment	0.000
Life-Threatening Severity	0.000
Death	0.000
<b>Total Casualties for Evening Event</b>	
Medical Aid	0.175
Hospital Treatment	0.011
Life-Threatening Severity	0.000
Death	0.000

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<b>SUMMARIZED HAZUS RESULTS: HAZUS Analysis</b>	
<b>Jurisdiction: Town of Paradise</b>	
<b>Scenario: Cleveland Fault (Foothills Fault System) Earthquake 5.7</b>	
<b>Direct Economic Loss Estimates (thousands of \$)</b>	
Structural Damage	\$ 48.22
Non-Structural Damage	\$ 125.75
Total Loss	\$ 173.97
<b>Bridge Functionality</b>	
Day 1	99.9
Day 3	99.9
Day 7	99.9
Day 14	99.9
<b>Bridge Damage</b>	
None	1.000
Slight	0.000
Moderate	0.000
Extensive	0.000
Completely Destroyed	0.000
<b>Fire Station Functionality</b>	
Day 1	99.8
Day 3	99.8
Day 7	99.9
Day 14	99.9
<b>Fire Station Structural Damage</b>	
None	0.998
Slight	0.002
Moderate	0.000
Extensive	0.000
Completely Destroyed	0.000
<b>Police Station Functionality</b>	
Day 1	99.8
Day 3	99.8
Day 7	99.9
Day 14	99.9
<b>Police Station Structural Damage</b>	
None	0.998
Slight	0.002
Moderate	0.000
Extensive	0.000
Completely Destroyed	0.000

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<b>Commercial Casualties for Evening Event</b>	
Medical Aid	0.042
Hospital Treatment	0.005
Life-Threatening Severity	0.000
Death	0.000
<b>Commuting Casualties for Evening Event</b>	
Medical Aid	0.000
Hospital Treatment	0.000
Life-Threatening Severity	0.000
Death	0.000
<b>Educational Casualties for Evening Event</b>	
Medical Aid	0.000
Hospital Treatment	0.000
Life-Threatening Severity	0.000
Death	0.000
<b>Hotels Casualties for Evening Event</b>	
Medical Aid	0.000
Hospital Treatment	0.000
Life-Threatening Severity	0.000
Death	0.000
<b>Industrial Casualties for Evening Event</b>	
Medical Aid	0.003
Hospital Treatment	0.000
Life-Threatening Severity	0.000
Death	0.000
<b>Other Residential Casualties for Evening Event</b>	
Medical Aid	0.036
Hospital Treatment	0.002
Life-Threatening Severity	0.000
Death	0.000
<b>Single Family Casualties for Evening Event</b>	
Medical Aid	0.006
Hospital Treatment	0.000
Life-Threatening Severity	0.000
Death	0.000
<b>Total Casualties for Evening Event</b>	
Medical Aid	0.087
Hospital Treatment	0.007
Life-Threatening Severity	0.000
Death	0.000

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**Structural Hazards**

**Unreinforced Masonry Buildings**

The performance of a structure during an earthquake varies considerably, depending on the proximity of the building to an active fault or some other ground hazard, such as erosion or liquefaction. It also depends on the materials it is built from, the magnitude, intensity, and duration of the quake, and similar factors. Butte County has experienced two damaging earthquakes (1940 and 1975). Unreinforced masonry buildings in the older sections of Chico (1940) and Oroville (1975) suffered moderate to severe damage in these earthquakes.

The majority of buildings in the unincorporated areas of Butte County are one- and two-story wood frame structures, most of which are single family dwellings. Concentrations of larger buildings are found on the campuses of Butte Community College and California State University, Chico. Adjacent to or in Oroville and Chico are several shopping malls that have several major structures with large open areas. Concentrations of one to three story unreinforced masonry structures (primarily brick) are located in the older downtown areas of Chico and Oroville.

In general, evidence from past earthquakes shows that wood frame structures properly tied to their foundations perform very well, or if badly damaged, cause few injuries and life loss even if located in poor ground areas. Older wood frame structures that have stone, brick, or cripple wall foundations, or that are not bolted to their foundations, do not perform well. Unreinforced masonry structures, on the other hand, perform poorly under almost all earthquake conditions, and especially if located on poor ground areas. Nearby relatively small earthquakes can be very damaging because of the sharp motions they generate. Distant events, while more damaging to taller buildings, can also damage unreinforced masonry buildings because of the stresses caused by long-period motions.

Mobile homes generally perform very well because of their lightness, but failures of their weak foundation supports (usually flimsy metal stands or concrete blocks) can produce serious damage and economic losses. Older mobile homes are also considered serious fire hazards because of the non-fire resistant wall paneling and other materials. The performance of other structures depends on their specific characteristics, quality of construction, and other factors discussed above.

There is one Earthquake Fault Zone in the County - the Cleveland Hills Fault - south of Oroville. This Zone was established by the California Division of Mines and Geology (now the California Geological Survey), pursuant to Public Resources Code Sections 2621-2630. This law requires that a geologic report be filed as a precondition for building permit, in order to allow the local building official to judge the damage to the proposed building in case of a fault rupture.

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The Board of Supervisors is responsible for adopting codes and standards for the construction, repair, or alteration of structures. Butte County's Development Services Department-Building Inspection Division is the agency responsible for enforcing building regulations in the unincorporated areas. The Cities of Chico, Gridley, Oroville, and Paradise have their own building inspection departments.

**Mitigation Goals and Strategies**

**Butte County**

Butte County's Findings, Policies and Implementation Measures include:

- Finding 1  
Butte County is in an area of known faults and recent seismic activity.  
  
Policy 1  
Inform the public of current estimates of seismic hazard in all parts of the County.  
  
Implementation 1  
Approve and publish this plan element. Keep the information up-to-date.
- Finding 2  
The only known active fault in Butte County is the Cleveland Hill fault near Oroville. A number of faults in or near the County should be considered potentially active. The proximity of the San Andreas fault system is generally significant in evaluating seismic risk in the County.  
  
Policy 2  
Take into account all known seismic information in making land use decisions. Avoid location schools, hospitals, public buildings, and similar uses in known active fault areas.  
  
Implementation 2
  - a. Consider the most recent information on seismic hazard in all zoning and subdivision decisions.
  - b. Require appropriate detailed seismic investigations for all public and private projects in locations of known active fault areas.
- Finding 3  
The area around the Cleveland Hill fault has been designated as a Special Studies Zone under the Alquist-Priolo act, effective January 1, 1977 (Chapter 7.5, Division 2, California Code).

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Policy 3

Follow the policies and criteria established by the State Mining and Geology Board within the Special Studies Zone.

Implementation 3

Exercise approval authority with respect to all real estate development and structures for human occupancy within the Special Studies Zone, as provided by State Law.

- Finding 4  
Portions of the Sacramento Valley have a generally high potential for liquefaction during a major earthquake.

Policy 4

Consider liquefaction potential in making land use decisions

Implementation 4

Require appropriate design of structures susceptible to the effects of liquefaction.

**City of Biggs**

Goals, Policies and Programs of the City of Biggs include:

Goal 6.5 Minimize the threat of personal injury and property damage due to seismic and geologic hazards.

Policy 6.5.A Consider the potential for expansive soils and earthquake related hazards when reviewing applications for developments.

Policy 6.5.B A soils report, prepared by a licensed soils engineer, shall be required for all residential subdivisions and development projects. Soils reports shall evaluate shrink/swell and liquefaction potential of sites and recommend measures to minimize unstable soil hazards.

Policy 6.5.C Applications for projects which extract groundwater, oil, or gas shall include a report evaluating the potential for resulting subsidence. Reports shall discuss appropriate mitigation measures to reduce the potential for subsidence.

Policy 6.5.D The City encourages owners of buildings which are subject to seismic hazards to pursue structural improvements to remedy seismic related hazards.

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Program 6.5.E The City shall pursue funding options to assist property owners with costs related to seismic safety structural improvements.

Program 6.5.1 The City shall work with the Butte County Building Department to establish and implement programs to identify buildings which present seismic safety concerns and explore opportunities to assist owners of such structures with accomplishing necessary improvements.

Program 6.5.3 The City shall monitor the elevation of groundwater at City wells. Fluctuations in groundwater levels shall be recorded to determine long term trends in groundwater elevation.

**City of Chico**

Goals and Policies of the City of Chico include:

S-G-2 Protect lives and property from seismic and geologic hazards.

S-I-4 Continue requiring projects in areas that have highly expansive soils to undertake necessary studies and structural precautions as part of the project approval process. These areas are identified in Figure 8-2. Where prior soil studies on similarly-situated property, have been conducted, the City may waive the requirement for field work in order to avoid imposing unnecessary application costs.

S-I-6 Undertake a program to assess the risk posed by unreinforced masonry buildings in the City, including retrofitting costs and funding alternatives as part of the City's building inspection program; require retrofitting such buildings when significant risk is established by the assessment.

Because of the potential ground shaking associated with quakes along faults close to the Planning Area it is prudent that the risk posed by unreinforced masonry buildings in the City be assessed. Retrofitting would be required when occupancy changes were made that resulted in increased hazards to life and/or safety, such as conversion from retail to a nightclub or a restaurant use.

The City also could use zoning as an incentive to encourage retrofitting, and a Seismic Retrofit Ordinance could be adopted.

The City requires a structural analysis for any proposed change in the type of occupancy of an unreinforced masonry building which results in an increased hazard to life and/or public safety. Under the authority of the Building Code, the City may require reinforcement of the building as a condition of approving a certificate for the new

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occupancy. The objective of this policy is to ensure that there will be no increased risk to occupants of these buildings. However, no inventory of the number of URM buildings or their condition has been compiled, so the degree of risk posed by URM buildings in the City is unknown.

**City of Gridley**

The City of Gridley's General Plan Safety Goals, Seismic Safety Standards:

**Goals:**

1. Minimize the impact of hazards upon people and property by incorporation of safety considerations into the community development process.
2. Minimize the expansion or intensification of disasters once an event has occurred by insuring adequate community preparedness for rapid and efficient response.
3. Provide a reasonable safe habitat in which people may live, work or play.
4. Minimize loss of life and damage to property in the event of disaster.
5. Make existing structures as safe as possible.
6. Achieve the lowest possible community fire rating as fiscally possible for the City and its citizens.
7. Coordinate and augment area emergency response and mutual assistance agreements with neighboring cities, Butte County and the State of California.
8. Support reasonable County, State and Federal efforts, plans and programs for disaster prevention and response.

**Standards:**

1. Require all new construction within the community to be constructed according to the standards of the Uniform Building Code. The City should also require that all essential, critical or high occupancy facilities be able to withstand an earthquake intensity of VIII on the Modified Mercalli Scale.

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**City of Oroville**

Following are the Objectives and Implementing Policies of the City of Oroville:

**Objectives: Seismicity, Geology, and Soils**

- 8.10a Continue to protect lives and property by investigating and minimizing geologic and seismic hazards or by locating development away from such hazards and endorse public awareness programs provided by other public agencies.
- 8.10b Support implementation of Butte County General Plan policies relating to geologic and seismic hazards, and consult a professional geologist where conflicting information exists or where no published information is available.
- 8.10c Continue to restrict development within Alquist-Priolo Special Studies Zones.
- 8.10d Require areas identified as having significant liquefaction potential to be subjected to a geotechnical study prior to development approval and to mitigate the potential hazard to a level of insignificance; if mitigation is not possible, preserve these areas as Environmental Conservation Safety or in agriculture.
- 8.10e Monitor studies related to induced seismicity; if further studies establish a conclusive relationship between reservoir drawdown, refilling, and seismic activity, encourage the Department of Water Resources to manage the Oroville Dam water regime to reduce risk.
- 8.10f Use the building inspection program to inventory and evaluate earthquake hazards in existing buildings, and work towards the systematic upgrading of seismically unsafe buildings.
- 8.10g Develop a City-based public awareness and preparedness program to educate the public of the potential for earthquakes and other natural disasters (such as tornadoes) within the Planning Area, and what to do in the event of an earthquake or other disaster.
- 8.10h Regulate development on unstable slopes to minimize hazards.
- 8.10i For sites where a preliminary soils report indicates the presence of critically expansive soils, surface groundwater, or other soil problems, require geologic soils investigations prepared by a registered civil engineer to determine the extend of and mitigation for geologic hazards.

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- 8.10j Encourage project design which minimizes the potential for wind and water erosion to occur. Where necessary, require the preparation and implementation of a soil erosion plan, including soil erosion mitigation during construction.
- 8.10k Request and encourage the Division of Mines and Geology to comprehensively map landslide susceptibility throughout the Planning Area.
- 8.10l Continue to monitor ongoing studies identifying potentially active faults or fault segments.

**Town of Paradise**

Goals and Policies of the Town of Paradise include:

- SG-6 Improve the communication system(s) used during town wide emergencies, such as wildland fires, earthquakes or volcanic occurrences.
- SP-15 Development projects should be designed to minimize soil erosion, and shall be required to comply with all Town of Paradise-adopted soil erosion standards maintained by the Paradise Community Development Department.
- SP-16 The town should require all development proposals on sites which contain slopes exceeding twenty percent, and/or which border or include significant and sensitive stream courses or natural drainageways, to include programs for replanting and slope stabilization, erosion control plans, and to incorporate designs which minimize grading and cut-and-fill.
- SP-17 Building on slopes in excess of thirty percent should not be permitted.
- SI-5 Educate residents regarding the dangers of seismic activity and wildland fires, and the Town of Paradise Multihazard Disaster Plan and adopt the Town of Paradise Multihazard Disaster Plan by reference in the General Plan.
- SI-6 Enforce and comply with the provisions of the Uniform Building Code and the Uniform Fire Code.
- SI-8 Amend the town ordinances as necessary to require erosion control plans, site design which minimizes grading and cut-and-fill, and programs for replanting and slope stabilization.

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**Hazard: Landslide**

**Jurisdictions Affected by Landslide**

<b>Butte County Probability: Medium</b>	<b>Butte County Severity: Medium</b>
<b>Biggs Probability: Low</b>	<b>Biggs Severity: Low</b>
<b>Chico Probability: Low</b>	<b>Chico Severity: Low</b>
<b>Gridley Probability: Low</b>	<b>Gridley Severity: Low</b>
<b>Oroville Probability: Medium</b>	<b>Oroville Severity: Low</b>
<b>Paradise Probability: Low</b>	<b>Paradise Severity: Low</b>

**Hazard Definition**

A landslide is a geologic hazard where the forces of gravity combine with other factors to cause earth material to move or slide down an incline. Landslides occur in all U.S. states and territories. In a landslide, masses of rock, earth, or debris move down a slope. Landslides may be small or large, slow or rapid. They are activated by:

- storms
- earthquakes
- volcanic eruptions
- fires
- alternate freezing or thawing
- steepening of slopes by erosion or human modification

Debris and mud flows are rivers of rock, earth, and other debris saturated with water. They develop when water rapidly accumulates in the ground, during heavy rainfall or rapid snowmelt, changing the earth into a flowing river of mud or “slurry.” They can flow rapidly, striking with little or no warning at avalanche speeds. They also can travel several miles from their source, growing in size as they pick up trees, boulders, cars, and other materials.

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Although steep slopes are commonly present where landslides occur, it is not necessary for the slopes to be long. Landslides, rock falls, and debris flows occur continuously on all slopes; some processes act very slowly, while others occur very suddenly, often with disastrous results. As human populations expand over more of the land surface, these processes become an increasing concern. There are predictable relationships between local geology and landslides, rock falls and debris flows. Knowledge of these relationships can improve planning and reduce vulnerability. Slope stability is dependent on many factors and their interrelationships, including rock type, slope steepness, and natural or man-made undercutting.

**History**

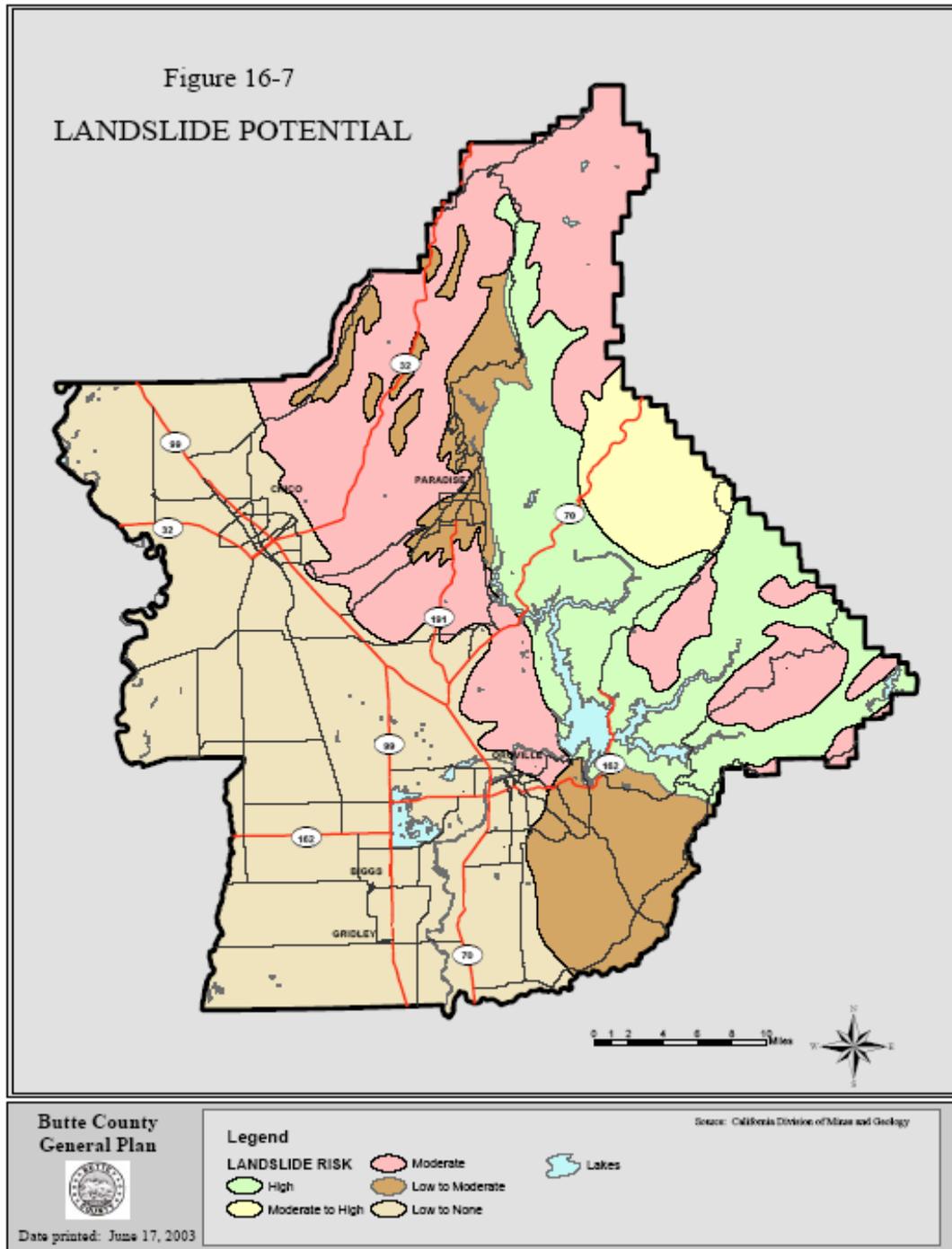
Butte County has a history of landslides and has experienced numerous landslides this year totaling to more than \$152,000 in estimated damages to property and cost for debris removal. Most landslides in Butte County occur on slopes greater than 15 percent, and most new landslides occur in areas that have experienced previous landslides. The areas of highest landslide potential are in the mountainous central area of the County where well-developed soils overly impervious bedrock on steep slopes which at times undergo heavy rainfall. The slopes around flat uplands, such as Table Mountain, are also highly susceptible to landslides.

Most of the rest of Butte County has moderate to low landslide potential. The areas of lowest landslide potential are the flat lands of the Sacramento Valley. There may, however, be some landslide hazard due to possible liquefaction of soils bordering the Sacramento River and its tributaries.

Areas of potential landslides are shown in the following map.

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**Risk Assessment**

There is a continuing risk of landslides during seasons of high precipitation. In addition, earthquakes could also cause significant landslides. The County has a great deal of hilly and mountainous terrain increasing the likelihood of a landslide incident.

- **Effects on people and housing.** Landslides constitute a threat to property, road safety, and life. Small landslides would not pose a serious risk. However, there is a possibility that a severe landslide in a populated area could cause significant damage and risk to life.
- **Effects on commercial and industrial structures.** Landslides can result in damage to property and cause buildings to become unsafe either due to distress or collapse during sudden or gradual slope movement. Structures constructed in steep terrain, possibly on stable ground, may also experience landslide hazards if they are sited in the path of potential mud flows or rockslide hazards.
- **Effects on infrastructure.** Landslides can result in the destruction of infrastructure such as roadways, water and sewer lines, electrical and telecommunications utilities and drainage.

**Risk assessment conclusion.** Most of Butte County has moderate to low landslide potential but are a continuing risk especially during seasons of high precipitation.

**Relationship to Other Hazards – Cascading Effects**

As noted, landslides can be the result of an earthquake or severe wet weather.

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**Hazard: Extreme Weather**

**Jurisdictions Affected by Extreme Weather**

<b>Butte County Probability: Low</b>	<b>Butte County Severity: Medium</b>
<b>Biggs Probability: Low</b>	<b>Biggs Severity: Low</b>
<b>Chico Probability: Low</b>	<b>Chico Severity: Medium</b>
<b>Gridley Probability: Low</b>	<b>Gridley Severity: Medium</b>
<b>Oroville Probability: Medium</b>	<b>Oroville Severity: Medium</b>
<b>Paradise Probability: Medium</b>	<b>Paradise Severity: Medium</b>

**Hazard Definition**

Extreme weather hazards in Butte County are:

- Drought
- Extreme winter weather (heavy rain/hailstorm/windstorm)
- Tornados

**Drought** must be defined not only in terms of below normal precipitation, but also in terms of duration. Occasional periods of below average precipitation will not seriously deplete moisture reserves. Droughts become severe if “wet seasons” pass without significant precipitation. Drought and extreme heat can cause shortages of water and food crops. Prolonged shortages of moisture can be enough of a drain on moisture reserves to seriously affect crops, livestock, forest and range lands, as well as hydro-electric, irrigation, and urban water supplies. Parched lands are more susceptible to wildfires during periods of drought. Droughts can actually result in later flooding. The vegetation dies without water, and as a result, even average rain can cause flooding.

**Extreme winter weather** in the context of Butte County, extreme winter weather refers to heavy rain, hailstorms, and windstorms.

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**Tornados** are violent storms with whirling winds of up to 300 miles per hour. It appears as a funnel shaped cloud, from gray to black in color, which extends to the ground from the base of the thunderstorm. Tornados move at an average speed of 30 mph and generally move from the southwest to northeast. Their direction of travel can be erratic and may change suddenly. These short-lived storms are the most violent of all atmospheric phenomena and the most destructive, over a small area. U.S. tornados are classified into six intensity categories, named F0 – F5. These categories are based upon the estimated maximum winds occurring within the funnel. Following is the Tornado Scale.

<b>Maximum Wind Speeds</b>	<b>Typical Effects</b>
F-0 40-72 mph	Gale Tornado. Light Damage: Some damage to chimneys; breaks twigs and branches off trees; pushes over shallow-rooted trees; damages signboards; some windows broken; hurricane wind speed begins at 73 mph.
F-1 73-112 mph	Moderate Tornado. Moderate damage: Peels surfaces off roofs; mobile homes pushed off foundations or overturned; outbuildings demolished; moving autos pushed off the roads; trees snapped or broken.
F-2 113-157 mph	Significant Tornado. Considerable damage: Roofs torn off frame houses; mobile homes demolished; frame houses with weak foundations lifted and moved; boxcars pushed over; large trees snapped or uprooted; light-object missiles generated.
F-3 158-206 mph	Severe Tornado. Severe damage: Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forests uprooted; heavy cars lifted off the ground and thrown; weak pavement blown off roads.
F-4 207-260 mph	Devastating Tornado. Devastating damage: Well constructed homes leveled; structures with weak foundations blown off some distance; cars thrown and disintegrated; large missiles generated; trees in forest uprooted and carried some distance away.
F-5 261-318 mph	Incredible Tornado. Incredible damage: Strong frame houses lifted off foundations and carried considerable distance to disintegrate; automobile-sized missiles fly through the air in excess of 300 ft (100 m); trees debarked; incredible phenomena will occur.
F-6 Greater than 319 mph	The maximum wind speeds of tornadoes are not expected to reach the F6 wind speeds.

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**History**

**Drought.** Butte County chronically experiences drought. The 1987 to 1992 and 1994 drought was notable for its six-year duration and the statewide nature of its impacts throughout California. Groundwater extraction increased substantially during the drought which caused excessive drawdown of the groundwater table. Numerous private domestic wells went dry, as did wells supplying small systems in rural areas. In addition, the drought conditions have caused extensive weakening of trees in forested areas causing them to become highly vulnerable to disease and insect infestation. Many trees have weakened and died, creating a severe fire hazard. Furthermore, wildland brush areas are dry, presenting wildfire risk.

The following table summarizes the time and duration of droughts in Butte County during the twentieth century.

<b>Northern California Recent Drought Years</b>	
<b>Drought Years</b>	<b>Duration (Years)</b>
1912-1913	1
1918-1920	2
1923-1924	1
1929-1934	5
1947-1950	3
1959-1961	3
1976-1977	1
1987-1992	5
1993-1994	1

Source: Butte County Drought Preparedness Plan

**Extreme Winter Weather.** A wide range of precipitation has been recorded throughout the County. Precipitation ranges from less than 20 inches of rainfall annually in the western valley area to over 80 inches of snow and rain in the eastern Cascades and Sierra Nevada mountains. There is a strong meteorological dynamic between the low elevation valley areas and the eastern mountains that causes more precipitation higher in the mountains. The majority of the precipitation falls as rain below the 4,000 foot elevation. Above 4,000 feet, a considerable portion of winter precipitation occurs as snow.

The following table depicts extreme winter weather incidents occurring in Butte County.

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Location	Date	Type	Death/Injuries	Reported Property Damage/Description
Butte	06/15/1978	Thunderstorm Winds	0	None Reported
Butte	09/25/1986	Hail, Magnitude .75 inches	0	None Reported
Butte	02/28/1988	Thunderstorm Winds, Magnitude 52 kts.	0	None Reported
Butte	04/23/1989	Thunderstorm Winds, Hail, Magnitude .75 inches	0	None Reported
Butte	09/26/1991	Thunderstorm Winds	0	None Reported
Butte	02/19/1993	High Winds	0	Strong winds ahead of an intensifying Pacific storm. Heavy rains with the winds caused road flooding in Butte County.
Butte	11/11/1993	Lightning	0	\$5 Million. Lightening struck a department store during an evening thunderstorm. The fire smoldered for several hours before it was reported. Substantial damage was done to the store.
Oroville	02/10/1994	Funnel Clouds	0	A Fire Chief heading to the site of a tornado observed three funnel clouds.
Biggs	01/1995	Heavy Rain, High Winds		Rainfall totaling 3 - 4 inches accumulated in just 24 hours. Flooding was generally limited to public streets. Many trees were damaged or destroyed by high winds, numerous power outages both within the City and with the electric company's transmission lines.
Palermo	03/04/1996	Thunderstorm Winds, Magnitude 50 kts.	0	None Reported
Countywide	01/12/1998	Heavy Rain	0	Heavy rains from a strong Pacific storm caused widespread but minor flooding.
Countywide	01/18/1998	Heavy Rain	0	Heavy rains from a Pacific storm brought brief but heavy rain to the area. Power outages and numerous traffic accidents occurred.
Bush Creek	01/22/2000	Heavy Rain	0	Rainfall totaling 4.91 inches accumulated in just over 48 hours.

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Location	Date	Type	Death/Injuries	Reported Property Damage/Description
Oroville	02/22/2001	Hail, Magnitude 1.00 inches	0	One inch of hail was reported in Oroville.
Chico	02/22/2001	Hail, Magnitude 1.00 inches	0	One inch of hail was reported in Chico.
Town of Paradise	02/22/2001	Hail, Magnitude 1.00 inches	0	One inch of hail was reported in Magalia, 10 miles north of the Town of Paradise.
Brush Creek	02/22/2001	Hail, Magnitude 1.00 inches	0	One inch of hail was reported in Brush Creek.
Oroville	01/07/2005	Heavy Rain	0	None Reported
Durham	06/10/2005	Hail, Magnitude .75 inches	0	None Reported
Countywide	12/22/2005	Heavy Rain	0	A series of powerful but warm winter storms brought heavy rainfall to Northern California during a five day period. It brought 13.02 inches of rain to Brush Creek and 4.65 inches of rain to Oroville.

Source: NOAA National Climatic Data Center, FEMA Region IX

**Tornados.** Butte County has a history of chronic tornados. The following table describes events dating back to 1970, which resulted in six injuries and over \$8 million in damages.

Location	Date	Type	Death/Injuries	Reported Property Damage
Butte	06/28/1970	Tornado Length - 2 miles Width - 33 yards Magnitude F1	0	None Reported
Butte	03/04/1978	Tornado Length - 2 miles Width - 53 yards Magnitude F0	0	\$3,000
Butte	03/23/1978	Tornado Magnitude F0	0	\$25,000
Butte	01/22/1981	Tornado Magnitude F0	0	\$3,000
Butte	12/17/1992	Tornado Length - 1 mile Width - 100 yards Magnitude F1	4 Injured	\$2.5 M
Biggs	01/07/1993	Tornado Length - 0 miles	0	\$50,000. A barn roof was tossed 75 feet and 2 vehicles were damaged by the

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Location	Date	Type	Death/ Injuries	Reported Property Damage
		Width – 10 yards Magnitude F1		tornado.
Chico	04/17/1003	Tornado Length – 0 miles Width – 25 yards Magnitude F0	0	\$1,000 in property damage, \$100 in crop damage. A tornado touched down in the center of Chico near Chico State University. The brief touchdown resulted in damage to a number of trees.
Oroville	02/10/1994	Tornado Length – 0 miles Width – 20 yards Magnitude F2	2 Injured	\$5 M. A tornado formed behind a cold front and traveled through a housing subdivision in Oroville. A total of 47 homes were damaged. One home was destroyed while 25 other suffered major damage. A full sized motor home was toppled and pushed forward several feet.
Oroville	03/10/1994	Tornado Length – 0 miles Width – 30 yards Magnitude F0	0	\$500,000. Falling trees damaged houses and knocked out power lines.
Honcut	04/25/1994	Tornado Length – 0 miles Width – 20 yards Magnitude F0	0	Fire department officials spotted the tornado as it briefly touched down in southern Butte County.
Richvale	05/16/1998	Tornado Length – 0 miles Width – 10 yards Magnitude F0	0	None Reported
Oroville	01/08/2005	Tornado Length-Unknown Width – Unknown Magnitude F1	0	\$20,000. Brief touchdown reported south of Oroville damaging two structures.
Durham	04/08/2005	Tornado Length-Unknown Width – Unknown Magnitude F0	0	\$10,000. Minor damage to a residence and nearby trees.

Source: NOAA National Climatic Data Center, FEMA Region IX

**Risk Assessment**

- **Effects on people and housing, commercial and industrial structures and infrastructure.** Extreme weather incidents as noted above can cause extensive and costly damage to housing, commercial and industrial structures, infrastructure and even injury or loss of life. The danger is multiplied by the risks of wildfire ignitions, power line downing, floods, and landslides/mudslides. It is highly unlikely that a hailstorm constituting significant property damage or loss of life will occur in the County.

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**Risk assessment conclusion.** Butte County is at some risk for drought. Thunderstorms, heavy winds, heavy rainfall and tornados have all caused damage to the County in the past and will no doubt occur again in the future. Hailstorms constitute minimal risk.

**Relationship to Other Hazards – Cascading Effects**

Drought leads to the weakening and ultimately death of trees which constitute increased fire hazard. Thunderstorms, heavy winds, heavy rainfall and tornados carry the risks of floods, power and communications outages, landslides and mudslides.

**Plans and Programs**

The Butte County Department of Water and Resource Conservation has developed the Butte County Drought Preparedness and Mitigation Plan (Drought Plan) to provide an efficient and systematic process for the County that results in a short- and long-term reduction in drought impacts to the citizens, economy, and environment in Butte County.

The Drought Plan includes:

- An institutional framework to approach drought
- A monitoring plan
- A response and mitigation plan

**Mitigation Goals and Strategies**

Following are Butte County’s Drought Planning Mitigation Measures:

Management Category	Mitigation Measure
Water	Evaluate appropriate irrigation system types that will help reduce evaporation, percolation, and runoff
	Examine ways to make the existing irrigation system more efficient and easy to maintain
	Build an emergency water storage system
	Build a tail-water return system
	Store water in water supply and drainage ditches
	Install water measurement devices to track water use
	Drill wells or deepen existing ones to tap deeper groundwater aquifers
Land	Use conservation tillage to increase soil moisture and reduce evaporation
	Use conservation practices that reduce runoff and increase infiltration
	Closely monitor soil moisture using the “feel” method at a minimum
	Contract early for supplemental feed and examine alternate feed sources
	Examine and revise schedules for culling herds

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<b>Management Category</b>	<b>Mitigation Measure</b>
Crop	Consider more drought tolerant crops if feasible
	Consider new crop rotations if feasible
	Evaluate other cropping systems that require less water if feasible
	Practice stress management of orchards or remove older, less productive trees if possible

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**Hazard: Dam Failure**

**Jurisdictions Affected by Dam Failure**

<b>Butte County Probability: Low</b>	<b>Butte County Severity: Very High</b>
<b>Biggs Probability: Low</b>	<b>Biggs Severity: High</b>
<b>Chico Probability: Low</b>	<b>Chico Severity: Low</b>
<b>Gridley Probability: Low</b>	<b>Gridley Severity: Low to Very High</b>
<b>Oroville Probability: Low</b>	<b>Oroville Severity: Very High</b>
<b>Paradise Probability: Low</b>	<b>Paradise Severity: Low</b>

**Hazard Definition**

A dam failure is the partial or complete collapse of an impoundment, with the associated downstream flooding. Flooding of the area below the dam may occur as the result of structural failure of the dam, overtopping, or a seiche. Dam failures are caused by natural and manmade conditions. The list of causes includes earthquake, erosion of the face or foundation, improper siting, structural/design flaws, and prolonged rainfall and flooding. The primary danger associated with a dam failure is the swift, unpredictable flooding of those areas immediately downstream of the dam.

There are three general types of dams: earth and rock fill, concrete arch or hydraulic fill, and concrete gravity. Each of these types of dams has different failure characteristics. The earth and rock fill dam will fail gradually due to erosion of the breach; a flood wave will build gradually to a peak and then decline until the reservoir is empty. A concrete arch or hydraulic fill dam will fail almost instantaneously; with a very rapid build-up to a peak and then a gradual decline. A concrete gravity dam will fail somewhere in between instantaneous and gradual, with corresponding build-up of flood wave.

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**History**

As of 2003, there are 24 dams in Butte County under the jurisdiction of the California Department of Water Resources Division of Safety of Dams (DSD) as shown on the following table.

A majority of these dams (15) are earth fill embankments. The remaining dams can be categorized as follows: three gravity concrete dams, three variable radius concrete arch dams, two rock embankment dams, and one hydraulic fill dam. These dams function in a variety of service capacities for the County, including irrigation, recreation, stock watering, power production, and municipal water supply. The reservoirs contained by these dams range in size from 85 acre feet to 3,537,377 acre feet. The following table depicts the dams under State jurisdiction in Butte County.

**Dams Under State Jurisdiction in Butte County**

<b>Dam Name</b>	<b>Owner</b>	<b>Construction Type</b>	<b>Storage Capacity (acre-feet)</b>	<b>Year Completed</b>
A L Chaffin	George Chaffin	Earth	450	1957
California Park	E M West	Earth	446	1966
Cannon Ranch	Spring Valley Minerals	Earth	217	1870
Concow	Nevada Irrigation District	Variable Radius Arch	8,600	1925
Desabla Forebay	Pacific Gas & Electric	Earth	280	1903
Feather River Hatch	CA Department of Water Resources	Gravity	580	1964
Forbestown Divers	Oroville-Wyandotte Irrigation District	Variable Radius Arch	358	1962
Grizzly Creek	Ronald T. Dreisbach	Earth	76	1964
Kunkle	Pacific Gas & Electric	Earth	253	1907
Lake Madrone	Lake Madrone Water District	Earth	200	1931
Lost Creek	Oroville-Wyandotte Irrigation District	Variable Radius Arch	5,680	1924

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<b>Dam Name</b>	<b>Owner</b>	<b>Construction Type</b>	<b>Storage Capacity (acre-feet)</b>	<b>Year Completed</b>
Magalia	Paradise Irrigation District	Variable Radius Arch	5,680	1924
Miners Ranch	Oroville-Wyandotte Irrigation District	Earth and Rock	912	1962
Oroville	CA State Department of Water Resources	Earth	3,537,377	1965
Paradise	Paradise Irrigation District	Earth	11,500	1957
Philbrook	Pacific Gas & Electric	Earth	5,180	1926
Poe	Pacific Gas & Electric	Gravity	1,150	1959
Ponderosa Diversion	Oroville-Wyandotte Irrigation District	Earth	4,750	1962
Round Valley	Pacific Gas & Electric	Earth and Rock	85	1895
Sly Creek	Oroville-Wyandotte Irrigation District	Earth	65,050	1961
Thermalito Diversion Dam, Afterbay and Forebay	CA State Department of Water Resources	Earth	57,041	1967

Source: Department of Water Resources, State of California, Dams within the Jurisdiction of the State of California

Division personnel inspect the Department of Water Resources Division of Safety Dams (DSD) each year. The DSD has also evaluated the seismic safety of the dams at Lake Wyandotte, Lost Creek, and Round Valley. As a result of the study done for Lake Wyandotte, the spillway has been lowered to contain the reservoir in the event of dam lowering in an earthquake. Lost Creek dam personnel submitted their study and are in the process of studying several faults of special concern. Round Valley has also submitted a study which found the dam in compliance with earthquake standards. The main focus of this study was correcting seepage. According to the area engineer for the Division of Dam Safety, this problem has been corrected.

In a 1992 study of Magalia Dam it was concluded that the upstream slope of the dam was found to have inadequate stability under seismic loading conditions. As of 2003 the water level in the reservoir was lowered, due to seismic stability concerns. The County is doing preliminary engineering on a project to widen the Skyway across Magalia Dam. The Paradise Irrigation District's preferred alternative for the widening project involves

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stabilizing the dam and would permit the restoration of the design water level behind Magalia Dam.

The DSD also identified an additional safety hazard at the Lake Madrone dam. The spillway is below the minimum design standard. It has been certified as safe for a 1:500 year flood, whereas the normal minimum level is 1:1,000 years. However, minimum levels differ in various locations and depends on construction type, terrain, seismic features in the area, and habitat (human and otherwise) in the downstream flood zone. This facility is under court order to increase dam spillway capacity. Of the remaining dams, Kunkle is typical of several dams whose use has been restricted to a particular storage level. The DSD believes these dams are safe at a particular fill level and has restricted their use to that level or lower.

**Risk Assessment**

The County of Butte is subject to potential flooding from several local dams, reservoirs, streams, rivers, and washes. Seasonal flooding with failure of run-off storage reservoirs, canals, and levees could seriously compound the situation, particularly in or near urban population centers. From the time of complete failure to inundation could be as little as 5-to-10 minutes.

With major disruptions in power and communications systems, warning may not be received from dam or reservoir sites in time to initiate an organized evacuation or broadcast warnings via emergency radio stations. If a credible prediction is initiated, then preparation for a damaging earthquake could begin and residents and business owners within dam inundation areas could be directed to assembly areas to wait for official word regarding safe re-entry. This method of direction and control could substantially reduce potential loss of life, if enough warning were available.

- **Effects on people and housing.** The effects on people and housing can be significant. Loss of life and loss of property are very real risks. The shelter requirements for displaced persons can be enormous.
- **Effects on commercial and industrial structures.** Similarly, commercial and industrial structures face risks running the gamut from significant damage to total loss.
- **Effects on infrastructure.** Dam failure may be a direct or indirect cause of power outages. These outages can be extensive in geographic area and numbers of persons affected.

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**Risk assessment conclusion.** Dam failure incidents have not historically been a problem in Butte County. As noted above, seasonal flooding with failure of run-off storage reservoirs, canals, and levees could seriously compound the risks of dam failure and additional flooding. A primary cause of dam failure is exposure to seismic activity. The California Department of Water Resources has identified dams which are considered safety hazards due to potential damage resulting from earthquakes. Oroville Dam and the Thermalito complex are not considered at risk to seismic activity.

**Relationship to Other Hazards – Cascading Effects**

Dam failure obviously causes downstream flooding. It may also lead to power failures and downed power lines. The secondary effects of dam failure can include the disruption of the local and state economies by damage to buildings and roads, the severance of communications, the disruption of supply and delivery mechanisms, additional welfare, and emergency aid to the recovering economy. Earthquakes can endanger dams in several ways, including failure of the foundations or dams themselves due to ground failures, or through secondary effects such as seiches and landslides in the reservoir.

**Plans and Programs**

Several methods have been used to improve the seismic stability of dams in California. Multiple arch dams are being stiffened, and embankment dams are being buttressed. Reservoir storage restrictions are being used to improve dam safety.

Records maintained at the California Office of Emergency Services provided potential failure inundation maps for 11 dams affecting Butte County. These maps were compiled into the GIS digital coverage of potential dam inundation zones for Butte County. These maps are intended to be used by state and local officials for the development and approval of dam failure emergency procedures as described in the California Government Code. The maps are also used to provide information needed to make natural hazard disclosure statements required by legislation.

Inundation maps have been required since 1972, following the 1971 San Fernando Earthquake and near failure of the Lower Van Norman Dam. Eleven maps for Butte County are on file with the State Office of Emergency Services. Eight dams do not have maps on file, and they have been requested. Four are regulated by the Federal Energy Regulatory Commission (FERC), and maps are assumed to exist for these. Only one dam (Hatchery) is not required to have an inundation map.

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**Hazard: Volcano**

**Jurisdictions Affected by Volcano**

<b>Butte County Probability: Very Low</b>	<b>Butte County Severity: Low</b>
<b>Biggs Probability: Very Low</b>	<b>Biggs Severity: Low</b>
<b>Chico Probability: Very Low</b>	<b>Chico Severity: Low</b>
<b>Gridley Probability: Very Low</b>	<b>Gridley Severity: Low</b>
<b>Oroville Probability: Very Low</b>	<b>Oroville Severity: Low</b>
<b>Paradise Probability: Very Low</b>	<b>Paradise Severity: Low</b>

**Hazard Definition**

A volcano is a vent in the surface of the Earth through which magma erupts and also the landform that is constructed by the erupted material.

The Earth's surface is made up of a patchwork of about a dozen large plates that move relative to one another at speeds from less than one centimeter to about ten centimeters per year (about the speed at which fingernails grow). These rigid plates, whose average thickness is about 80 kilometers, are spreading apart, sliding past each other, or colliding with each other in slow motion on top of the Earth's hot, pliable interior. Volcanoes tend to form where plates collide or spread apart, but they can also grow in the middle of a plate.

**History**

Some of the most striking topographic features of Butte County, including Table Mountain north of Oroville, are volcanic in origin. The lava flows which now cap Table Mountain and most of the other volcanic features in the County are, however, tens of millions of years old. The geologic activity producing this volcanism has long since ceased. However, extreme northern Butte County is an exception to this generalization

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because Mount Lassen, an active volcano, is only about 25 miles north of the Butte County line.

Mount Lassen is the southernmost volcano in the Cascade Range. There are numerous active volcanoes in the Cascades, including Mount Shasta in California and several others in Oregon and Washington. Mount Lassen last erupted in the period between 1914 and 1921; this period of volcanic activity included steam and ash eruptions as well as a small lava flow. Like the other volcanoes in the Cascades, Mount Lassen is considered dormant, which means that it is not currently erupting but is expected to erupt again in the future. Mount Lassen has erupted at least seven times within the past 1,200 years.

**Risk Assessment**

There are four main hazards that may accompany volcanic eruptions: 1) ash and cinder falls, 2) explosive blasts, 3) lava flows, and 4) mud flows.

- **Effects on people and housing.** Populations living near volcanoes are most vulnerable to volcanic eruptions and lava flows, although volcanic ash can travel and affect populations many miles away. Houses, buildings, roads, and fields can get covered with ash and roofs could collapse upon extreme ash buildup (especially if wet). If the ash fall is really heavy it can make it impossible to breathe.
- **Effects on commercial and industrial structures and infrastructure.** Houses, buildings, roads, and fields can get covered with ash and roofs could collapse upon extreme ash buildup (especially if wet). Lava flows can run over structures.

**Risk assessment conclusion.** Despite the general severity of volcanic hazards, potential volcanic hazards for Butte County are limited to the northernmost portions of the County. Even here, the hazards are relatively modest because of the distance between Butte County and Mount Lassen. In historic times, there are no records of significant ash falls, explosive effects, lava flows or mud flows reaching Butte County. Furthermore, impending volcanic eruptions generally give numerous advance warning signs and thus it is usually possible to evacuate residents in areas subject to volcanic hazards.

**Relationship to Other Hazards – Cascading Effects**

Volcano eruption can cause landslides, mud and debris flows, affect power lines and cause illness or possibly death from exposure to ash.

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**Hazard: Hazardous Materials Incidents**

**Jurisdictions Affected by Hazardous Material Incidents**

<b>Butte County Probability: Low to Medium</b>	<b>Butte County Severity: High to Very High</b>
<b>Biggs Probability: Low</b>	<b>Biggs Severity: High</b>
<b>Chico Probability: Medium</b>	<b>Chico Severity: High</b>
<b>Gridley Probability: Medium</b>	<b>Gridley Severity: High</b>
<b>Oroville Probability: Medium</b>	<b>Oroville Severity: Very High</b>
<b>Paradise Probability: Medium</b>	<b>Paradise Severity: Medium</b>

**Hazard Definition**

Hazardous materials (Hazmat) consist of substances that by their nature, lack of containment, and reactivity, have the capability for inflicting harm. Hazmat poses a threat to health and the environment when improperly managed. Hazmat can be toxic, corrosive, flammable, explosive, reactive, an irritant, or a strong sensitizer. Hazmat substances also include certain infectious agents, radiological materials, oxidizers, oil, used oil, petroleum products, and industrial solid waste substances.

Hazardous materials can pose a threat where they are manufactured, stored, transported or used. They are used in almost every manufacturing operation and by retailers, service industries, and homeowners.

Hazardous material incidents are one of the most common technological threats to public health and the environment. Incidents may occur as the result of natural disasters, human error, and/or accident.

Hazmat incidents typically take three forms:

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- Fixed facility incidents
  - It is reasonably possible to identify and prepare for a fixed site incident, because laws require those facilities to notify state and local authorities about what is being used or produced there.
- Transportation incidents
  - Transportation incidents are more difficult to prepare for because it is impossible to know what material(s) could be involved until an accident actually happens.
- Pipeline incidents
  - Pipelines carry natural gas and petroleum. Breakages in pipelines carry differing amounts of danger, depending on where and how the break occurs, and what is in the pipe.

**History**

According to Butte County's Hazardous Waste Management Plan, the County's hazardous waste production is about 6,500 tons per year. This amount does not include hazardous wastes treated on-site. The most recent inventory of Butte County hazardous waste generators, provided by the California Department of Toxic Substances Control, shows a total of 22,036 tons produced in 2001. The largest percentage is composed of waste oil, with small quantity generators producing the majority of the amount. Waste oil is the predominant hazardous waste produced by large and small quantity generators counting for over 84 percent of the County's waste production in 2001 (the most recent year for which data is available).

The major generators of this waste in the County are haulers that are licensed to pick up used oil from locations in other counties. Therefore, the largest sources of hazardous waste important to Butte County are outside of the County. It is brought in by a licensed hauler and then shipped out for recycling, treatment, or disposal. Medical wastes are another growing source of hazardous wastes in the County.

Household hazardous waste facilities are operated by Norcal Waste Systems in Oroville, A.C. Industrial Services in Chico, and Waste Management, Inc. in Gridley, for the benefit of their customers.

Investigations by the Federal Environmental Protection Agency (EPA) have found surface and ground water contamination at the Oroville site.

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The Butte County Hazardous Materials Response Team is the agency which responds to large scale, emergency hazardous material incidents within the County. This team was organized by the Butte County Fire Chiefs Association brought in through the use of a Joint Powers Agreement (JPA). Team members are provided through various departments from the cities of Chico, Oroville, Paradise, Biggs, and Gridley; and the County of Butte/CDF Fire. Funding is provided through the JPA at \$.10 per capita (serving 210,000 people of Butte County), Cal EPA grants, and reimbursements.

Annual responses number about 120, with drug labs and waste being the main cause of incidents. Other significant incidents include train derailments, tanker overturns, agricultural incidents, and a U-2 which crashed into Oroville.

The Humboldt Road Burn Dump in Chico has been the subject of extensive investigation. This site involves large amounts of burn dump waste, including the primary city disposal area, several smaller areas historically operated by private companies, and substantial areas of scattered waste. While the site has been extensively characterized, no final corrective action alternative has yet been selected. The Regional Water Quality Control Board is the lead agency for this voluntary cleanup action. The Regional Water Quality Control Board ordered the site be remediated by removing contaminated soils. Remaining soils were consolidated and capped. At this time the majority of the remediation has been completed. One area remains to have corrective action initiated and the Regional Board has issued a Cleanup and Abatement Order to the responsible parties.

The Neal Road Landfill, a Class III facility, is not permitted to accept hazardous waste. Class I landfills are permitted to accept these materials. The County does not have any Class I landfill disposal or treatment facilities. The Butte County Hazardous Waste Management Plan identified that the amount of hazardous wastes produced or brought into the County cannot economically support the development of a Class I facility within Butte County.

Hazardous materials transported through Butte County are carried by truck on the State Highway system or via the rail line. County roads and city streets are used to transport locally generated wastes from the source to the regional highway system.

Hazardous materials are regularly shipped via the rail line and, while unlikely, an incident involving a rail accident within the County could have devastating effects. Unfortunately, the County has little control over the types of materials that are shipped via the rail line. With regard to government activities, the content of shipments may be confidential for reasons of security. While the County has little influence over the types of material transported via the rail line, the potential for rail incidents can be reduced by ensuring that at-grade crossings within the County are operating in a safe and effective manner.

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**Risk Assessment**

- **Effects on people and housing.** People may be evacuated when a Hazmat incident occurs. Relative to some of the other natural hazards assessed earlier in this MHMP, the numbers of people affected by Hazmat incidents are usually less.
- **Effects on commercial and industrial structures.** There may be economic consequences due to Hazmat incidents, but the damage is generally limited to clean-up of facilities and grounds, or simply interruption of business due to evacuation.
- **Effects on infrastructure.** Hazmat incidents involving transportation may result in downed power lines. Also, Hazmat materials may impact waterways and drainage systems, and incidents can lead to the evacuation of schools, business districts, and residential areas. Hazmat materials may also impact agricultural irrigation supply (canals, rivers, lakes) or drinking/environmental water for the State Water Project.

**Risk assessment conclusion.** Although the point of hazard in a Hazmat incident can have serious property damage and even loss of life, Hazmat accidents do not generally affect extremely large areas. Hazmat incidents present a real danger and are highly unpredictable in terms determining when or where they will occur, but they generally do not pose a serious threat to the ability of Butte County to respond. Reasonable preparation by the Butte County Hazardous Materials Response Team which is made up of specially trained representatives of the Butte County Fire Department, California Department of Forestry and members of the City of Chico, Paradise, Oroville, Gridley and Biggs Fire Departments enables the County to deal with the majority of likely events.

**Relationship to Other Hazards – Cascading Effects**

Besides the immediate effect of a hazardous materials incident at the scene of the emergency, there are ancillary effects as well. For instance, there may be impacts on waterways and drainage systems, and the evacuation of schools, business districts, and residential areas.

**Plans and Programs**

In April 2002, Butte County assumed responsibility of a Permanent Household Hazardous Waste Collection Facility (PHHWCF). The PHHWCF is located adjacent to the Chico Airport and is operated under contract by A/C Industrial Services, Inc. The PHHWCF provides a controlled environment for receiving and processing household hazardous waste that originates within Butte County. The PHHWCF is open to all

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residents of Butte County. Conditionally exempt small quantity generators can also use the facility. In addition, Household Hazardous Waste Collector Events are serving outlying areas of the County.

The Butte County Division of Environmental Health has submitted an application to the California Environmental Protection Agency for certification as a Certified Unified Program Agency (CUPA). Upon resolution of program funding issues, the Division hopes to obtain CUPA certification. Additional CUPA program elements include inspection of hazardous waste generators, “Tiered Permitting” hazardous waste treatment facilities (conditionally exempt, conditionally authorized, and permit by rule tiers only), and limited oversight of above ground hazardous material storage tank facilities.

Administered by the Environmental Health Division, the County collects inventory forms from facilities that store hazardous materials. In order to fulfill legislative requirements, the County has developed a Hazardous Materials Emergency Response Plan.

In the event of a hazardous material emergency, several agencies are responsible for timely response, depending on the extent and type of the incident. The Butte County Hazardous Materials Response Team is the agency which responds to large scale, emergency hazardous material incidents within the county. This team is made up of specially trained representatives of the Butte County Fire Department, California Department of Forestry, and members of the City of Chico, Paradise, Oroville, Gridley, and Biggs Fire Departments. The team is composed of 33 specialists/technicians and an additional 10 technicians who provide support. The team trains together monthly, and, with the State-approved hazardous materials (“haz-mat”) training grounds at Butte College, training includes a variety of hands-on experiences.

The team is Type 1 and staffs two units. The newer unit, Haz Mat 64, is stationed at the Kelly Ridge CDF Fire/Butte County Station, and Haz Mat 1 (an older unit) is stationed at Chico Station 1. Each unit carries level A and level B suits, allowing them to enter most toxic atmospheres. They also carry proximity suits. The units carry chemical analysis kits, air monitoring and gas detection tools, printed and computer chemical databases, decontamination equipment, and a variety of hand tools. Special equipment includes: chlorine kits, stinger and air drill for fuel tankers, underflow and overflow pipes and valves, and a large amount of absorbents.

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**Hazard: Insect Infestation / Non Vectors of Human Diseases**

**Jurisdictions Affected by Insect Infestation / Non Vectors of Human Diseases**

<b>Butte County Probability: Medium</b>	<b>Butte County Severity: High</b>
<b>Biggs Probability: Low</b>	<b>Biggs Severity: Low</b>
<b>Chico Probability: Medium</b>	<b>Chico Severity: High</b>
<b>Gridley Probability: Low</b>	<b>Gridley Severity: Medium</b>
<b>Oroville Probability: Medium</b>	<b>Oroville Severity: Very High</b>
<b>Paradise Probability: Low</b>	<b>Paradise Severity: High</b>

**Hazard Definition**

Insect infestation occurs when an undesirable type of insect inhabits an area in a manner that causes serious harm to agriculture crops, livestock, or poultry; wild land trees, plants, or animals, or humans. Countless insects live on, in, and around plants, animals, and humans in all environments. Many are harmless, while others can cause fatal damage. Under some conditions, insects that have been present and relatively harmless can become hazardous. For example, severe drought conditions can weaken trees and make them more susceptible to destruction from insect attacks. The major forms of insects are:

**Chewing insects** are defoliating insects. They generally strip plants of green matter such as leaves. Caterpillars and beetles make up the largest proportion of chewing insects. Under normal conditions, trees can usually bounce back from an attack of these defoliators, though repeat infestation will weaken a tree and can eventually kill it by starving it of energy.

**Boring, or tunneling, insects** cause damage by boring into the stem, roots, or twigs of a tree. Some lay eggs which then hatch and the larvae burrow more deeply into the wood, blocking off the water-conducting tissues of the tree. Boring insects generally feed on the vascular tissues of the tree. If the infestation is serious, the upper leaves are starved

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of nutrients and moisture, and the tree can die. Signs of borer infestation include entry/exit holes in the bark, small mounds of sawdust at the base, and sections of the crown wilting and dying.

**Sucking insects** do their damage by sucking out the liquid from leaves and twigs. Many sucking insects are relatively immobile, living on the outside of a plant and forming a hard protective outer coating while they feed on the plant's juices. Quite often they will excrete a sweet, sticky substance known as honeydew which contains unprocessed plant material. Honeydew can cause sooty mold to form on leaves and can become a nuisance. Signs of infestation include scaly formations on branches, dieback of leaves, and honeydew production.

Also, while not technically an "insect," it is worth noting that pathogens such as fungi can kill large stands of trees. For example, *Phytophthora ramorum*, the cause of Sudden Oak Death, which is devastating not only for oaks, but for many other species of trees as well, is spreading rapidly.

In conjunction with the above outlined problems, insects can carry and spread disease to plants, animals, and people.

### **History**

The number one industry in Butte County is agriculture, which provides a very significant base to the County's economy. Butte County's gross value of agricultural production for 2004 totaled \$358,274,000. This is a 12.8 million dollar increase over the 2003 gross value total.

Throughout Butte County, 1,216 traps were placed to detect the presence of the pest: Gypsy Moth, Mediterranean Fly, Japanese and Khapra Beetle, Oriental, Melon and Olive Fruit Flies and Glassy-winged Sharpshooter. 1,873 Olive Fruit Flies were trapped.

Pest eradication for the Spotted Knapweed, Diffuse Knapweed, Hoary Cress, Perennial Peppergrass, White Horsenettle, Skeleton Weed and Dyer's Woad is controlled by a combination of mechanical and chemical methods at 52 sites throughout the County.

### **Risk Assessment**

The climate in Butte County makes it possible for insects to reproduce with little natural hindrance to their proliferation.

- **Effects on people and housing.** In the case of Sudden Oak Death the fire hazard it creates can cost loss of homes and life.

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- **Effects of agriculture and commercial and industrial structures.** If a given insect is particularly hazardous to crops, livestock, forest, or property, it can cost the County millions of dollars in lost revenue in eradication and replacement.

**Relationship to Other Hazards – Cascading Effects**

Insect infestation to wild land trees not only leaves dead stands of trees but, as a result, also increases the fuel available to wildfires, thereby exacerbating the negative effect on ecotourism.

**Risk assessment conclusion.** Insect infestation is an ongoing threat to agriculture and public health in Butte County. The effects on people and property can be disastrous and costly.

**Plans and Programs**

Pesticide use in California is monitored ensuring the continued availability and use of these vital tools for agriculture. Restricted materials permits are issued for pesticide use and site inspections are performed prior to use. A vital function of this program is the recording of all agricultural pesticide applications from the Use Reports submitted by growers and/or commercial applicators. Departmental personnel provide out-reach to the general community and to growers. As a final measure, commodities are sometimes sampled prior to harvest and analyzed for pesticide residues. All this provides protection for the consumer, the worker, the environment, and the grower, making Butte County and California agriculture products some of the safest in the world.

**Pest Management**

The Agricultural Commissioner's department works with CDFA and USDA to develop the use of effective biological controls for use on troublesome pests of agriculture. Seven (7) different biological control organisms have been released throughout the County to help in the control of such bothersome pests as: Puncture Vine, Yellow Starthistle, Ash Whitefly, Purple Loosestrife, Klamath Weed and Italian Thistle.

**Pest Detection**

Butte County is involved with a proactive program to primarily detect insect pests before they become established. Traps are monitored throughout the entire county for the presence of any exotic pests of agriculture, such as the Mediterranean, Oriental and Melon Fruit Fly, Gypsy Moth, Japanese Beetle, Khapra Beetle, etc. These insect pests have an enormous host range and are difficult and costly to eradicate once they become established. Through early detection this program is protecting more than agriculture. The environment is protected by limiting the need for more pesticide applications. The

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quality of produce is higher when exotic pests are detected early and prevented from becoming established as common pests. Consumers are protected from rising food costs as production expenses are less.

**Pest Exclusion**

The Pest Exclusion program provides protection to the County by regulatory control through the use of quarantines to prevent the introduction of pests, which are not known to exist or are of very limited distribution within the County. Last year over 9,800 inspections were conducted at various locations in the County checking incoming plant material for cleanliness. Many harvested crops are exported to foreign countries. Phytosanitary certificates are issued declaring the commodity shipments meet the pest-free requirements of these other countries. Seed fields are inspected during the growing season to maintain a high standard of cleanliness for export.

*Phytophthora ramorum* is the causal agent for Sudden Oak Death. This pathogen is responsible for the loss of thousands of tanoaks and native oak along the U.S. West Coast. To prevent the spread into Butte County, suspect host and associated host plants are inspected and tested for the pathogen.

Butte County is a non-infested but, regulated County. The Compliance Agreement in Butte County allows host and associated host plants intrastate and interstate shipments. Each shipment must include a federal certificate or a stamp. This certificate is issued on an annual basis and an annual survey is required.

The promotion and protection of Butte County agriculture is accomplished through educational outreach and enforcement of the law. The local expertise is utilized to uniformly administer the following statewide programs here in Butte County.

As required by the California Food and Agricultural Code, the Butte County Agricultural Commissioner compiles and records information in the annual crop and livestock report regarding the gross production and value of the county's commodities. Various research institutions, schools, banks, government agencies, and businesses use this valuable information to the benefit of the local economy. Also, disasters to agriculture are surveyed and the information collected is used by other agencies offering disaster relief. Statistics promote and protect the continued production and prosperity of agriculture in Butte County.

The following table summarizes the varied activities conducted and the methods used to prevent and control the spread of exotic pests in Butte County. The pest detection, pest exclusion, and pest eradication programs serve to protect the county from infestation of introduced pests. Through monitoring and quick response to small infestations, damaging pest populations can be controlled before they require a large-scale response. Biological

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control provides a method of sustainable pest control with a minimum impact to the environment.

<b>Pest</b>	<b>Agent/Mechanism</b>	<b>Scope of Program</b>
<b><u>Pest Exclusion</u></b> Exotic Pests	Inspections	9,882 Shipments inspected for live pests, including Glassy-winged Sharp Shooter and Sudden Oak Death.
<b><u>Pest Detection</u></b> Gypsy Moth, Med. Fly, Japanese & Khapra Beetle, Oriental, Melon & Olive Fruit Flies and Glassy-winged sharpshooter	1,216 Traps placed throughout the County to detect the presence of these pests.	1,873 Olive Fruit Flies trapped.
<b><u>Pest Eradication</u></b> Spotted Knapweed, Diffuse Knapweed, Hoary Cress, Perennial Peppergrass, White Horsenettle, Skeleton Weed, Dyer's Woad	Controlled by a combination of mechanical and chemical methods.	52 Sites spread throughout the County.
<b><u>Pest Management</u></b> Glassy Winged Sharpshooter <u>Homalodisca coagulata</u>	Controlled by chemical method.	2 Treatments
<b><u>Pest Management and</u></b>	<b><u>Biological Control</u></b>	
Yellowstar Thistle <u>Centaurea solstitialis</u>	Seed Weevils/Gall Fly/Seed Fly <u>Bangasternus/Chaetoriella/</u> <u>Eustenpus/Larinus/Urophora</u>	Generally distributed
Klamath Weed <u>Hypericum perforatum</u>	Klamath Beetle <u>Chrysoline gemellata</u>	Generally distributed
Puncture Vine <u>Tribulus terrestris</u>	Stem and Seed Weevils <u>Microlarinus lypriformis</u>	Generally distributed
Italian Thistle <u>Carduus tenuiflorus/carduus</u> <u>pycnocephalus</u>	Seed head weevils <u>Rhinocyllus conicus</u>	Generally distributed
Ash Whitefly <u>Siphoninus Phillyreae</u>	Parasitic wasp <u>Encarsia partenopea</u>	Generally distributed

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Pest	Agent/Mechanism	Scope of Program
Purple loosestrife <u>Lythrum salicaria</u>	Root and seed weevils/leaf beetles <u>Hylobius/nanophyes/galerucella</u>	Nursery sites
Eucalyptus Red Gum Lerp Psyllid <u>Glycaspis brimblecombei</u>	Parasitic wasp <u>Psyllaephagus bliteus</u>	Nursery sites

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**Hazard: Naturally Occurring Biological Threats**

**Jurisdictions Affected by Naturally Occurring Biological Threats**

<b>Butte County Probability: Medium</b>	<b>Butte County Severity: High</b>
<b>Biggs Probability: Low</b>	<b>Biggs Severity: Medium</b>
<b>Chico Probability: Medium</b>	<b>Chico Severity: High</b>
<b>Gridley Probability: Low</b>	<b>Gridley Severity: Medium</b>
<b>Oroville Probability: Medium</b>	<b>Oroville Severity: Medium</b>
<b>Paradise Probability: Medium</b>	<b>Paradise Probability: Medium</b>

**Hazard Definition**

Public health-related hazards may be the result of a naturally occurring event or terrorism. Key hazards of concern to Butte County today are described below.

**West Nile Virus (WNV)** is a mosquito-borne virus that has been found in parts of Asia, Eastern Europe, Africa, and the Middle East. The virus arrived in the Western Hemisphere in 1999 in New York City. The more severe forms of West Nile virus are West Nile encephalitis, West Nile meningitis, and West Nile meningoencephalitis. Encephalitis refers to an inflammation of the brain, meningitis is an inflammation of the membrane around the brain and the spinal cord, and meningoencephalitis refers to inflammation of the brain and the membrane surrounding it.

**Avian Influenza (Bird Flu) and Avian Influenza A (H5N1) Virus** is an infection by avian (bird) influenza (flu) viruses. These influenza viruses occur naturally among birds. Wild birds worldwide carry the viruses in their intestines, but usually do not get sick from them. However, avian influenza is very contagious among birds and can make some domesticated birds, including chickens, ducks, and turkeys, very sick and kill them.

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Infected birds shed influenza virus in their saliva, nasal secretions, and feces. Susceptible birds become infected when they have contact with contaminated secretions or excretions or with surfaces that are contaminated with secretions or excretions from infected birds. Domesticated birds may become infected with avian influenza virus through direct contact with infected waterfowl or other infected poultry, or through contact with surfaces (such as dirt or cages) or materials (such as water or feed) that have been contaminated with the virus.

Infection with avian influenza viruses in domestic poultry causes two main forms of disease that are distinguished by low and high extremes of virulence. The “low pathogenic” form may go undetected and usually causes only mild symptoms (such as ruffled feathers and a drop in egg production). However, the highly pathogenic form spreads more rapidly through flocks of poultry. This form may cause disease that affects multiple internal organs and has a mortality rate that can reach 90-100% often within 48 hours.

Usually, avian influenza virus refers to influenza A viruses found chiefly in birds, but infections with these viruses can occur in humans. The risk from avian influenza is generally low to most people, because the viruses do not usually infect humans. However, confirmed cases of human infection from several subtypes of avian influenza infection have been reported since 1997. Most cases of avian influenza infection in humans have resulted from contact with infected poultry or surfaces contaminated with secretion/excretions from infected birds. The spread of avian influenza viruses from one ill person to another has been reported very rarely, and transmission has not been observed to continue beyond one person.

**Bovine Spongiform Encephalopathy (BSE)** is widely referred to as "mad cow disease." It is a chronic degenerative disease that affects the central nervous system of cattle. BSE is named because of the spongy appearance of the brain tissue of infected cattle examined under a microscope. BSE belongs to a family of diseases known as the transmissible spongiform encephalopathies (TSEs). TSE animal diseases found in the United States include scrapie in sheep and goats, chronic wasting disease in deer and elk, transmissible spongiform encephalopathy in mink, feline spongiform encephalopathy in cats, and in humans: kuru, both classic and variant Creutzfeldt-Jakob disease, Gerstmann-Straussler-Scheinker syndrome, and fatal familial insomnia.

The agent that is responsible for BSE and other TSEs has not been fully characterized. Although other types of agents have been implicated, the theory that is most accepted in the scientific community is that the agent is a prion, which is an abnormal form of a normal protein known as a cellular prion protein. The TSE agents are extremely resistant to heat, ultraviolet light, ionizing radiation, normal sterilization processes, and common

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disinfectants that normally inactivate viruses and bacteria.

There is no evidence to date that BSE emanated from TSEs in other animals. Regarding feeding practices, it is known that cattle can become infected with BSE by eating feed contaminated with the infectious BSE agent.

Current scientific research confirms that BSE infectivity occurs in the brain, trigeminal ganglia, tonsils, spinal cord, dorsal root ganglion, and distal ileum of the small intestine of cattle experimentally infected with the BSE agent. Research also confirms that BSE infectivity is in the brain, spinal cord, and retina of the eyes of cattle infected with the agent under field conditions.

BSE is not a contagious disease. There is no evidence that the disease is transmitted through direct contact or animal-to-animal spread. The primary means by which animals become infected is through consumption of feed contaminated with the infectious BSE agent.

**Botulism** is a serious paralytic illness caused by a nerve toxin that is produced by the bacterium *Clostridium botulinum*. There are three main kinds of botulism. Food borne botulism is caused by eating foods that contain the botulism toxin. Wound botulism is caused by toxin produced from a wound infected with *Clostridium botulinum*. Infant botulism is caused by consuming the spores of the botulinum bacteria, which then grow in the intestines and release toxin. All forms of botulism can be fatal and are considered medical emergencies. Food borne botulism can be especially dangerous because many people can be poisoned by eating a contaminated food.

**Campylobacter jejuni** (Pronounced "camp-e-low-back-ter j-june-eye") was not recognized as a cause of human food borne illness prior to 1975. Now, the bacterial organism is known to be the most common cause of food borne illness in the U.S. (*Salmonella* is the second most common cause). Food is the most common vehicle for the spread of *Campylobacter* and poultry is the most common food implicated. Some case-control studies indicate that up to 70% of sporadic cases of campylobacteriosis are associated with eating chicken. Surveys by the USDA demonstrated that up to 88% of the broiler chicken carcasses in the U.S. are contaminated with *Campylobacter* while a recent Consumer Reports study identified *Campylobacter* in 63% of more than 1000 chickens obtained in grocery stores. Other identified food vehicles include unpasteurized milk, undercooked meats, mushrooms, hamburger, cheese, pork, shellfish, and eggs.

**Canine Distemper** is a viral disease of young dogs characterized by high fever and respiratory inflammation. It can affect wild animals and County pets. Other animal diseases which can affect humans include rabies and toxoplasmosis (an opportunistic infection caused by the microscopic parasite *Toxoplasma gondii*, found in raw or

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undercooked meat and cat feces), as well as parasites such as roundworms, whipworms, hookworms, ringworms, and mange.

**E. coli** is found in the family of bacteria named Enterobacteriaceae, which is informally referred to as the enteric bacteria. Most forms of *E. coli* are harmless; however, there are strains that cause serious illness. Other enteric bacteria are the Salmonella bacteria (also a very large family, with many different members), *Klebsiella pneumoniae*, and *Shigella*, which many people consider to be part of the *E. coli* family.

**Exotic Newcastle Disease (END)** is a contagious viral disease affecting many species of birds including poultry and wild birds. This is probably one of the most infectious diseases of poultry in the world with a death rate of almost 100 percent in unvaccinated poultry flocks and so virulent that many birds die without showing any clinical signs. The disease can even infect and cause death in vaccinated poultry.

END is extremely contagious. The spread is primarily through direct contact between healthy birds and the bodily fluids of infected birds. It can be transmitted through infected bird droppings as well as secretions from the nose, mouth and eyes. It spreads rapidly among confined birds.... like commercially raised chickens. The disease is also easily spread by virus-bearing material picked up on shoes and clothing and carried from an infected flock to a healthy one. END can also spread from poultry flocks to wildlife as wild birds come into contact with infected poultry, possibly when wild birds enter a pen to feed on spilled grain. Although experiments have documented that several wild species including ducks and pheasants can develop the disease, widespread illness and death has only been documented in double-crested cormorants in the United States and Canada. This disease affects the respiratory, nervous and digestive systems, with an incubation period ranging from two to 15 days.

The available information suggests that Newcastle disease can affect people; however, it does not pose a significant health risk. In humans, the disease is usually limited to conjunctivitis, which is a mild inflammation of the tissues around the eyes and is seen in persons associated with infected birds or facilities where infected birds are housed. It should be noted that poultry products in the Arizona marketplace, including eggs and meat, continue to be safe to consume.

**Hantavirus** infection is caused by a group of viruses that can infect humans with two serious illnesses: hemorrhagic fever with renal syndrome (HFRS) and Hantavirus pulmonary syndrome (HPS). Hantaviruses are found without causing symptoms within various species of rodents and are passed to humans by exposure to the urine, feces, or saliva of those infected rodents. Ten different Hantaviruses have been identified as important in humans.

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**Hepatitis A** is one of five human hepatitis viruses that primarily infect the human liver and cause human illness. The other known human hepatitis viruses are hepatitis B, C, D, and E. Hepatitis A is relatively unusual in nations with developed sanitation systems such as the U.S. Nevertheless, it continues to occur here. Each year, an estimated 100 persons die as a result of acute liver failure in the U.S. due to hepatitis A. Approximately 30 - 50,000 cases occur yearly in the U.S. and the direct and indirect costs of these cases exceed \$300 million. Hepatitis A is totally preventable, and need not occur.

**Listeria monocytogenes** is a pathogenic (disease-causing) bacterium that is food-borne and causes an illness called listeriosis. It is frequently overlooked as a possible cause of illness due to its unique growth capabilities. First, it is somewhat difficult for laboratories to grow, and when they do so, *Listeria* can be confused with common harmless contaminants and disregarded. Second, most bacteria grow poorly when temperatures fall below 40°F, while *Listeria* survives at in temperatures from below freezing (20°F) to body temperature and it grows best at 0°F to 50°F, including the temperature range that we use for refrigeration. As a result, *Listeria* may be transmitted in ready-to-eat foods that have been kept properly refrigerated.

**Lyme Disease** (*Borrelia burgdorferi*) is a systemic, tick borne disease with protean manifestations, including dermatologic, rheumatologic, neurologic, and cardiac abnormalities. The best clinical marker for the disease is an initial skin lesion that occurs in 60%-80% of patients.

**Monkeypox** is a rare viral disease that occurs mostly in central and western Africa. It is called “monkeypox” because it was first found in 1958 in laboratory monkeys. Monkeypox was reported in humans for the first time in 1970. In early June 2003, monkeypox was reported among several people in the U.S. Most of these people got sick after having contact with pet prairie dogs that were sick with monkeypox. This was the first time that there had been an outbreak of monkeypox in the U.S. The disease is caused by Monkeypox virus. It belongs to a group of viruses that includes the smallpox virus (*variola*), the virus used in the smallpox vaccine (*vaccinia*), and the cowpox virus. In humans, the signs and symptoms of monkeypox are like those of smallpox, but usually they are milder. Another difference is that monkeypox causes the lymph nodes to swell.

**Norwalk virus** is a virus that attaches to the outside of cells lining the intestine. Once attached, it transfers its genetic material into that cell. There it reproduces, finally killing the human cell to release new copies of it that attach to more cells of the intestine's lining. Common names of the illness caused by the Norwalk and other small round structured or caliciviruses are viral gastroenteritis, acute nonbacterial gastroenteritis, food poisoning, and food borne infection. This illness occurs worldwide. Humans are the only known hosts. The viruses are passed in the stool of infected persons. Of viruses, only the common cold is reported more often than viral gastroenteritis. Norwalk and Norwalk-

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like viruses are increasingly being recognized as leading causes of food-borne disease in the United States. People most often get Norwalk virus infection by swallowing infected food or water. Outbreaks in the U.S. are often linked to eating raw shellfish, especially oysters and clams. Steaming does not kill the virus or prevent its transmission.

**Plague** is a disease caused by *Yersinia pestis* (*Y. pestis*), a bacterium found in rodents and their fleas in many areas around the world. Pneumonic plague is different from the bubonic plague. Both are caused by *Yersinia pestis*, but they are transmitted differently and their symptoms differ. Pneumonic plague can be transmitted from person to person; bubonic plague cannot. Pneumonic plague affects the lungs and is transmitted when a person breathes in *Y. pestis* particles in the air. Bubonic plague is transmitted through the bite of an infected flea or exposure to infected material through a break in the skin. Symptoms include swollen, tender lymph glands called buboes. Buboes are not present in pneumonic plague. If bubonic plague is not treated, however, the bacteria can spread through the bloodstream and infect the lungs, causing a secondary case of pneumonic plague. Patients usually have fever, weakness, and rapidly developing pneumonia with shortness of breath, chest pain, cough, and sometimes bloody or watery sputum. Nausea, vomiting, and abdominal pain may also occur. Without early treatment, pneumonic plague usually leads to respiratory failure, shock, and rapid death.

**Salmonella** is a type of bacteria that causes typhoid fever and many other infections of intestinal origin. Typhoid fever, rare in the U.S., is caused by a particular strain designated *Salmonella typhi*. But illness due to other *Salmonella* strains, just called "salmonellosis," is common in the U.S. Today, the number of known strains of this bacteria total over 2300.

**SARS** is a respiratory illness of unknown cause that has recently been reported in a number of countries. According to the World Health Organization (WHO), the main symptoms and signs of SARS include a fever greater than 100.5° F (38° C), and cough, shortness of breath, or difficulty breathing. The cause of SARS is not known at this time. Researchers at CDC and around the world are working to find the cause of SARS. At this early stage of the investigation, it seems more likely that SARS is caused by an organism that we have less experience with rather than a commonly occurring, known organism.

The **Shigella** germ is a bacterium that can cause sudden and severe diarrhea (gastroenteritis) in humans. *Shigella* lives in the human intestine and is commonly spread both through food and by person-to-person contact. The illness is also known as "bacillary dysentery." About 25,000 or so laboratory confirmed cases of shigellosis are reported each year in the U.S. However, many cases go undiagnosed and/or unreported, and the best estimates are that 450,000 cases of *Shigella* infection actually occur annually in the U.S.

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**Tularemia** is a potentially serious illness that occurs naturally in the U.S. It is caused by the bacterium *Francisella tularensis* found in animals (especially rodents, rabbits, and hares). Tularemia is also known as “rabbit fever.” Tularemia is usually a rural disease and has been reported in all U.S. states except Hawaii. Tularemia is a widespread disease in animals. About 200 human cases of tularemia are reported each year in the U.S. Most cases occur in the south-central and western states.

**History**

The first California recorded death from West Nile Virus in 2006 occurred in Butte County. In 2005 there was the presence of West Nile Virus infecting 25 humans, 79 birds, 53 sentinel chickens and 7 horses. Outbreaks had been localized and controlled. From 1995 to 2003 there have been reported 98 cases of Lyme disease in the County.

**Risk Assessment**

Given the existence of naturally occurring biological agents in Butte County, without enhanced public outreach, monitoring and control the potential exists for one or more of these virulent diseases to dramatically affect the life, health and safety of County citizens.

- **Effects on people and housing.** Humans are susceptible to the effects of most Naturally-Occurring Biological Threats.

**Risk assessment conclusion.** Because the risk for a pandemic outbreak of a lethal disease does exist, preparedness should be maintained at a high level.

**Plans and Programs**

**Public Health**

According to the California Code of Regulations, the County Health Officer (CHO) will take whatever measures are necessary to investigate and control reported or suspected diseases and conditions. Such measures include, but are not limited to, confirmation of a clinical or laboratory diagnosis, determination that an unusual disease or disease outbreak exists, determination and investigation of the source, and the prevention and control of the disease. Various functions within County Public Health assist the CHO, depending on the issues being addressed.

The Public Health Laboratory System in California is a unique and diverse system of 39 autonomous County and City facilities, working in close cooperation with the California Department of Health Services state laboratories. The Butte County Public Health Laboratory provides extensive laboratory services to the people of California for

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diagnostic and epidemiological investigations. The Health Department Laboratories are staffed by Public Health Microbiologists. These professionals are certified by the State of California, hold baccalaureate degrees and have been trained in approved public health laboratories. Laboratories vary in size from one certified Public Health Microbiologist to 50, depending on population and level of service provided. An approved Laboratory Director supervises each laboratory.

**Immediate Disease Control Measures**

Among other responsibilities, the CHO is authorized under the California Health and Safety Code to take measures as may be necessary to prevent the spread of communicable disease. Generally, actions may include obtaining information pertaining to the incident, assess the health risk to the community, notify appropriate agencies, and coordinate disease prevention and control with community, local, regional, state and federal agencies. Should it be necessary, the CHO will also initiate Quarantine measures within the County.

**Notification of First Responders, Medical Community and Public Sector**

If, after consultation with appropriate local, regional, state or federal agencies, the CHO determines that an imminent or actual health threat exists, local response will be initiated in accordance with emergency response and notification protocols. Depending on the nature of the event, potential responders may include local, state and/or federal emergency/disaster, law enforcement and health agencies.

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**Hazard: Terrorism**

**Jurisdictions Affected by Terrorism**

<b>Butte County Probability: Low</b>	<b>Butte County Severity: High</b>
<b>Biggs Probability: Low</b>	<b>Biggs Severity: Low</b>
<b>Chico Probability: Low</b>	<b>Chico Severity: High</b>
<b>Gridley Probability: Low</b>	<b>Gridley Severity: Low</b>
<b>Oroville Probability: Low</b>	<b>Oroville Severity: High</b>
<b>Paradise Probability: Low</b>	<b>Paradise Severity: Low</b>

**Hazard Definition**

Terrorism is defined in 28 CFR Section 0.85) as “...the unlawful use of force and violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives.” Since September 11, 2001, terrorism has become a fact of life for all Americans. Planning for response to potential terrorist incidents has long been part of California’s Emergency Preparedness Planning effort. California provides a target-rich environment for terrorists, with many facilities and venues and an easy place to hide in California’s diverse population. Effective hazard mitigation that reduces risk to terrorism must be based upon technical expert information and analysis of actual terrorist events.

Terrorists often use threats to create fear among the public, to try to convince citizens that their government is powerless to prevent terrorism, and to get immediate publicity for their causes. Terrorist acts or and acts of war may cause casualties, extensive property damage, fires, flooding, and other ensuing hazards.

Terrorism takes many forms, including:

- Chemical
- Biological

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- Radiological
- Nuclear
- Explosive
- Cyber-terrorism

**Chemical.** Chemical weapons have been used primarily to terrorize an unprotected civilian population and not as a weapon of war. This is because of fear of retaliation and the likelihood that the agent would contaminate the battlefield for a long period of time.

Some analysts suggest that the possibility of a chemical attack would appear far more likely than either the use of nuclear or biological materials, largely due to the easy availability of many of the necessary precursor substances needed to construct chemical weapons. Additionally, the rudimentary technical knowledge needed to build a working chemical device is taught in every college level chemistry course in the world.

Some chemical agents are odorless and tasteless and are difficult to detect. They can have an immediate effect (a few seconds to a few minutes) or a delayed effect (several hours to several days).

**Biological.** Biological weapons are defined as any infectious agent such as a bacteria or virus used to produce illness or death in people, animals, or plants. This definition is often expanded to include biologically-derived toxins and poisons. Biological agents can be dispersed as aerosols or airborne particles. Terrorists may use biological agents to contaminate food or water because the agents are extremely difficult to detect.

**Radiological.** A radioactive material is a material made up of unstable atoms which give off excess energy in the form of radiation through the process of radioactive decay. Radiation cannot be detected by human senses. Wherever radioactive materials are used, transported, or stored there is a potential for a radiological accident to occur. Some of their most common uses include use:

- By doctors to detect and treat serious diseases.
- By educational institutions and companies for research.
- By the military to power large ships and submarines.
- By companies in the manufacture of products.
- As a critical base material to help produce the commercial electrical power that is generated by a nuclear power plant.
- As one of the critical components in nuclear weapons, which are relied upon to help deter the threat of war.

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**Nuclear.** The possibility exists that a terrorist organization might acquire the capability of creating a small nuclear detonation. A single nuclear detonation in the United States would likely produce fallout affecting an area many times greater than that of the blast itself. There is also the possibility that a terrorist will construct a “dirty bomb”, a bomb that is used to distribute nuclear contaminated materials. It would have less of an effect than a “traditional” nuclear bomb, but the terror effect on the population would be great.

**Explosive.** The possibility exists that a terrorist may attack with conventional explosives, particular in a public setting. Innumerable incidents have occurred around the world involving car bombs, truck bombs, and bombs attached directly to terrorist individuals.

**Cyber-terrorism.** Cyber-terrorism is the use of computer network tools to shut down critical government infrastructures such as energy, transportation, and government operations, or to coerce or intimidate a government or civilian population. The premise of cyber terrorism is that as nations and critical infrastructure became more dependent on computer networks for their operation, new vulnerabilities are created. A hostile nation or group could exploit these vulnerabilities to penetrate a poorly secured computer network and disrupt or even shut down critical public or business operations.

The goal of cyber terrorism is believed to be aimed at hurting the economy of a region or country, and to amplify the effects of a traditional physical terrorist attack by causing additional confusion and panic.

**History**

Fortunately, Butte County has no history of incidents of chemical, biological, nuclear, radiological, or explosive terrorism. The County has been impacted – as has the rest of the world – by recent computer viruses and worms.

**Risk Assessment**

Many terrorist events have occurred in California, most recently the attempted attack on the Suburban Propane tanks in Elk Grove in 1999. Worldwide there were 457 incidents or planned acts during the period from 1980 to 1999. Of these, 135 were international and 322 domestic terrorism. The majority of these incidents (321) have been bombings. However, there is also a concern for the potential of Weapons of Mass Destruction (WMD) use in future terrorist events. The use of WMDs increases the potential for mass casualties and damage.

One of the special considerations in dealing with the terrorist threat is that it is difficult to predict. One must know the minds and capabilities of various terrorists and terrorist groups. These are characteristics terrorist organizations strive to conceal. Because all

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terrorists are not the same, the calculation is even more difficult. Two things are clear from the perspective of hazard mitigation. The most often used weapon of terrorists is bombs and the greatest potential for loss is from WMDs.

Because of the dynamic nature of the terrorist threat and the open nature of California society, all jurisdictions within California are vulnerable to terrorist attack.

**Chemical.** A terrorist would not have to build a complicated chemical release device. During favorable weather conditions an already existing chemical plant could be sabotaged or bombed releasing a toxic cloud to drift into a populated area. The result could be just as dangerous as having placed a smaller chemical device in a more confined space. This type of incident would cause the maximum amount of fear, trepidation, and potential panic among the civilian population, and thus achieve a major terrorist objective.

**Biological.** The agents are cheap, easy to make, and simple to conceal. Even small amounts, if effectively deployed, could cause massive injuries and overwhelm emergency rooms. The production of biological weapons can be carried out virtually anywhere — in simple laboratories, on a farm, or even in a home.

However, experts say it remains very difficult to transform a deadly virus or bacterium into a weapon that can be effectively dispersed. A bomb carrying a biological agent would likely destroy the germ as it explodes. Dispersing the agents with aerosols is challenging because biomaterials are often wet and can clog sprayers. Most agree that, while a biological attack could be devastating in theory, in reality, the logistical challenges of developing effective agents and then dispersing them make it less likely a terrorist could carry out a successful widespread assault.

**Radiological/Nuclear.** Under extreme circumstances an accident or intentional explosion involving radiological materials can cause very serious problems. Consequences may include death, severe health risks to the public, damage to the environment, and extraordinary loss of, or damage to, property.

**Explosive.** Explosive terrorist attacks may have consequences including death and damage to property.

**Cyber-terrorism.** Recent incidents illustrate the County's vulnerability to cyber-terrorism.

- **Effects on people and housing.** Depending on levels of contamination and exposure, effects could range from minimal to devastating.

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- **Effects on commercial and industrial structures.** Depending on levels of contamination and exposure, effects could range from minimal to devastating.
- **Effects on infrastructure.** Nuclear, radiological, and cyber-terrorism can have profound effects on infrastructure.
- **Effects on agriculture.** Depending on levels of contamination and exposure, effects could range from minimal to devastating.

**Risk assessment conclusion.** Due to events such as the 9/11 Twin Towers attack and the declared war against terrorism, national and local governments have assigned high priority to terrorist attack preparedness.

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**5. Multi-Jurisdiction Goals, Objectives, and Mitigation Strategies**

Butte County MHMP Planning Team held a workshop to review and analyze the risk assessment. The Planning Team developed goals and objectives based on the risk assessment studies and selected those that were determined to be of greatest benefit in hazard reduction to the County and participating cities.

Mitigation workshop photos



The goals, objectives and strategies developed during the mitigation workshop are as follows:

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<b>Wildfire</b>	<b>Butte Co</b>	<b>Biggs</b>	<b>Chico</b>	<b>Gridley</b>	<b>Oroville</b>	<b>Paradise</b>
<b>Goal:</b>	Reduce impact of wildland fire to infrastructure	Reduce impact of wildland fire to infrastructure	Reduce impact of wildland fire to infrastructure	Reduce impact of wildland fire to infrastructure	Reduce impact of wildland fire to infrastructure	Reduce impact of wildland fire to infrastructure
<b>Plan 1</b>	Continued fuel reduction program		Road / bridge construction for access		Road / bridge construction for access	Fire Lookouts
<b>Plan 2</b>	Road / bridge construction for access		Water service to areas being annexed		Water service to areas being annexed	Fuel Reduction
<b>Plan 3</b>	Uniform weed abatement across the County (uniform enforcement and fees for services)		Fire Lookouts		Fire Lookouts	Hazard Abatement Programs
<b>Plan 4</b>	Adoption of construction codes for the use of more fire resistant building materials				Weed Abatement-extension into new areas	
<b>Plan 5</b>	Uniform evacuation process (road construction / improvement)					
<b>Plan 6</b>	Expansion / improvement of water supply, hydrants, etc.					
<b>Plan 7</b>	Tankers, lookouts, hand crews					

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<b>Flooding</b>	<b>Butte Co</b>	<b>Biggs</b>	<b>Chico</b>	<b>Gridley</b>	<b>Oroville</b>	<b>Paradise</b>
<b>Goal:</b>	Protect infrastructure and agriculture from long-term risks of flood	Protect infrastructure and agriculture from long-term risks of flood	Protect downtown Chico and University	Protect infrastructure and residents from long-term risks of flood	Protect infrastructure from long-term risks of flood	Protect Roadway System
<b>Plan 1</b>	Increase the Butte Creek, Cherokee Levee levels for 100 year flood plan protection	Increase the Butte Creek, Cherokee Levee levels for 100 year flood plan protection	Little Chico Creek study; protection for 100 year flood	Feather River Levee Reinforcement	Protect commercial infrastructure by improving storm runoff system	Completion of Dry Creek Drainage Project (in progress)
<b>Plan 2</b>	Rock Creek and Keefer Slough flood control project (started and stalled)	Feather River flood control project - based on current assessment	Provide additional stormwater retention	Reinforce City Infrastructure adjacent to Feather River (Sewer Plant / Facilities)	Improvement of retention basins	Completion of Berry Creek Drainage Project (in progress)
<b>Plan 3</b>	3B's overflow facility construction	Flood mitigation plan for Afterbay and Forebay	Restore capacity of existing flood control features	Improve drainage system	Protect critical County infrastructure (i.e. relocate EOC) and records	Protect critical County infrastructure (i.e. relocate EOC) and records
<b>Plan 4</b>	Palermo-technical assessment	Protect critical County infrastructure (i.e. relocate EOC) and records	Protect critical County infrastructure (i.e. relocate EOC) and records	Protect critical County infrastructure (i.e. relocate EOC) and records		
<b>Plan 5</b>	DWR maintenance of flood control channels					
<b>Plan 6</b>	Protect critical County infrastructure (i.e. relocate EOC) and records					

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<b>Earthquake</b>	<b>Butte Co</b>	<b>Biggs</b>	<b>Chico</b>	<b>Gridley</b>	<b>Oroville</b>	<b>Paradise</b>
<b>Goal:</b>	To mitigate access issues and improve survivability	To mitigate access issues and improve survivability	To mitigate access issues and improve survivability	To mitigate access issues and improve survivability	To mitigate access issues and improve survivability	To mitigate access issues and improve survivability
<b>Plan 1</b>	Encourage water districts to improve all infrastructure		Additional funding for retro fitting / URM replacement	Additional funding for retro fitting / URM replacement	Additional funding for retro fitting / URM replacement	Critical facilities brought up to current building standards
<b>Plan 2</b>	Increase public preparedness awareness		Critical facilities brought up to current building standards	Critical facilities brought up to current building standards	Critical facilities brought up to current building standards	
<b>Plan 3</b>	Critical facilities brought up to current building standards					

<b>Landslide</b>	<b>Butte Co</b>	<b>Biggs</b>	<b>Chico</b>	<b>Gridley</b>	<b>Oroville</b>	<b>Paradise</b>
<b>Goal:</b>	Identify and inventory areas prone to the risk	Identify and inventory areas prone to the risk	Identify and inventory areas prone to the risk	Identify and inventory areas prone to the risk	Identify and inventory areas prone to the risk	Identify and inventory areas prone to the risk
<b>Plan 1</b>	Develop aerial photography and mapping library that can allow identification of vulnerable areas prior to building permits	Develop aerial photography and mapping library that can allow identification of vulnerable areas prior to building permits	Develop aerial photography and mapping library that can allow identification of vulnerable areas prior to building permits	Develop aerial photography and mapping library that can allow identification of vulnerable areas prior to building permits.	Develop aerial photography and mapping library that can allow identification of vulnerable areas prior to building permits	Develop aerial photography and mapping library that can allow identification of vulnerable areas prior to building permits
<b>Plan 2</b>	Build elevation models	Build elevation models	Build elevation models	Build elevation models	Build elevation models	Build elevation models
<b>Plan 3</b>	Evaluate road run-off and correct where necessary					
<b>Plan 4</b>	Evaluate water delivery system vulnerability (open ditches) and mitigate					

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<b>Extreme Weather</b>	<b>Butte Co</b>	<b>Biggs</b>	<b>Chico</b>	<b>Gridley</b>	<b>Oroville</b>	<b>Paradise</b>
<b>Goal:</b>	Improve public notification process / system and mitigate risks	Improve public notification process / system and mitigate risks	Improve public notification process / system and mitigate risks	Improve public notification process / system and mitigate risks	Improve public notification process / system and mitigate risks	Improve public notification process / system and mitigate risks
<b>Plan 1</b>	Common County early warning system	Ensure that critical infrastructure can withstand severe snow				
<b>Plan 2</b>						Common County early warning system

<b>Dam Failure</b>	<b>Butte Co</b>	<b>Biggs</b>	<b>Chico</b>	<b>Gridley</b>	<b>Oroville</b>	<b>Paradise</b>
<b>Goal:</b>	Improve public notification and evacuation programs					
<b>Plan 1</b>	Common County notification system					
<b>Plan 2</b>	Develop integrated, county-wide evacuation and sheltering plan					

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<b>Volcano</b>	<b>Butte Co</b>	<b>Biggs</b>	<b>Chico</b>	<b>Gridley</b>	<b>Oroville</b>	<b>Paradise</b>
<b>Goal:</b>	Increase the responsiveness to a volcanic event	Increase the responsiveness to a volcanic event	Increase the responsiveness to a volcanic event	Increase the responsiveness to a volcanic event	Increase the responsiveness to a volcanic event	Increase the responsiveness to a volcanic event
<b>Plan 1</b>	Expand integrated evacuation plan to address the unique situation of volcanic eruption					

<b>Hazardous Materials Incidents</b>	<b>Butte Co</b>	<b>Biggs</b>	<b>Chico</b>	<b>Gridley</b>	<b>Oroville</b>	<b>Paradise</b>
<b>Goal:</b>	Minimize the impact of a Haz Mat incident	Minimize the impact of a Haz Mat incident	Minimize the impact of a Haz Mat incident	Minimize the impact of a Haz Mat incident	Minimize the impact of a Haz Mat incident	Minimize the impact of a Haz Mat incident
<b>Plan 1</b>	Develop an updated evacuation / notification plan		Build a below-grade railroad crossing in downtown			

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<b>Insect Infestation</b>	<b>Butte Co</b>	<b>Biggs</b>	<b>Chico</b>	<b>Gridley</b>	<b>Oroville</b>	<b>Paradise</b>
<b>Goal:</b>	Increase detection and prevention of insect infestation	Increase detection and prevention of insect infestation	Increase detection and prevention of insect infestation	Increase detection and prevention of insect infestation	Increase detection and prevention of insect infestation	Increase detection and prevention of insect infestation
<b>Plan 1</b>	Enhance the education program for nursery owners, orchards and the public	Enhance the education program for nursery owners, orchards and the public	Enhance the education program for nursery owners, orchards and the public	Enhance the education program for nursery owners, orchards and the public	Enhance the education program for nursery owners, orchards and the public	Enhance the education program for nursery owners, orchards and the public
<b>Plan 2</b>	Augment detection programs to include flea markets, pet stores, exotic markets, parcel services and other pathways					
<b>Plan 3</b>	Augment weed management program including increasing weed-free forage and eradication of weeds by biological, cultural, chemical and other means					

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<b>Naturally Occurring Biological Threats</b>	<b>Butte Co</b>	<b>Biggs</b>	<b>Chico</b>	<b>Gridley</b>	<b>Oroville</b>	<b>Paradise</b>
<b>Goal:</b>	Increase detection, preparedness and responsiveness to potential biological threats	Increase detection, preparedness and responsiveness to potential biological threats	Increase detection, preparedness and responsiveness to potential biological threats	Increase detection, preparedness and responsiveness to potential biological threats	Increase detection, preparedness and responsiveness to potential biological threats	Increase detection, preparedness and responsiveness to potential biological threats
<b>Plan 1</b>	Expand program of food and food service business inspections					
<b>Plan 2</b>	Conduct more frequent biological incident response drills and exercises					
<b>Plan 3</b>	Enhance the screening program for pets, plants, and produce entering the County to protect the County's ecosystem and highly vulnerable agricultural industry					
<b>Plan 4</b>	Augment detection programs to include flea markets, pet stores, exotic markets, parcel services and other pathways					

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<b>Terrorism</b>	<b>Butte Co</b>	<b>Biggs</b>	<b>Chico</b>	<b>Gridley</b>	<b>Oroville</b>	<b>Paradise</b>
<b>Goal:</b>	Increase deterrence and prevention measures					
<b>Plan 1</b>	Educate citizenry for protection / prevention					
<b>Plan 2</b>	Harden critical infrastructure (e.g. EOC)					

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## **6. Multi-Jurisdiction Action Plan**

The process used to prioritize mitigation strategies involved lengthy discussions with various jurisdictional stakeholders, followed by citizen and community review. The end result is a hazard mitigation action plan with a prioritized list of strategies that Butte County and the participating jurisdictions expect to carryout during the next five years.

### **Prioritizing Strategies**

The process used was to first prioritized goals and their respective objectives based on priority maps created during the risk assessments. Available resources and public input were also considered. The County and participating jurisdictions next assessed each strategy listed under the prioritized list of goals. Butte County then prepared a draft action plan that listed goals followed by a prioritized list of strategies.

In assessing and evaluating each strategy, Butte County and the participating jurisdictions considered the following factors:

1. The cost was justified
2. Financial resources will be available; local or outside resources
3. Staff resources will be adequate
4. Minimal impact on County/jurisdiction's department functions
5. Strategies mitigate risks for the riskiest hazard events
6. Strategies reflect the goals and objectives

### **Implementation/Administration**

The final action plan will include the principal contact and cooperating parties, cost, and the time involved in carrying out the strategy. The use of FEMA's Benefit-Cost Analysis (BCA) software (FEMA Mitigation BCA Toolkit Version 3.0) will be used to identify the cost-effectiveness of each activity/project undertaken.

Each year the action plan will be revisited and the first year will be dropped as those activities are completed and another year will be added so that the action plan always reflects a five-year time frame and remains current. Strategies undertaken and completed will be evaluated as to their effectiveness.

For the planning areas subject to flood hazards, the mitigation actions and projects that reduce flood risk and deal with repetitive loss structures will be in compliance with the NFIP. Those activities not completed during the first year will be re-evaluated and included in the first year of the new action plan if still appropriate.

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Even though individual strategies will be assigned a principal contact to ensure implementation, overall responsibility, and oversight, the general monitoring of the action plan has been assigned to County OES. County OES will provide periodic updates to the County Board of Supervisors.

This action plan serves as a guide to spending priorities but will be adjusted annually to reflect current needs and financial resources. Some strategies will require outside funding to implement. If outside funding is not available, then the strategy will be set aside until new sources of funding can be identified.

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**a. Butte County**

<b>Hazard</b>	<b>Goal / Strategy</b>	<b>Action</b>	<b>Priority</b>	<b>Responsible Party</b>	<b>Timeframe</b>	<b>Cost</b>
Flooding	Protect infrastructure and agriculture from long-term risks of flood	Protect critical County infrastructure (i.e. relocate EOC) and records	1	To Be Developed	To Be Developed	To Be Developed
Dam Failure	Improve public notification and evacuation programs	Common County notification system	2	To Be Developed	To Be Developed	To Be Developed
Wildfire	Reduce impact of wildland fire to infrastructure	Tankers, lookouts, hand crews	3	To Be Developed	To Be Developed	To Be Developed
Wildfire	Reduce impact of wildland fire to infrastructure	Continued fuel reduction program	4	To Be Developed	To Be Developed	To Be Developed
Wildfire	Reduce impact of wildland fire to infrastructure	Adoption of construction codes for the use of more fire resistant building materials	5	To Be Developed	To Be Developed	To Be Developed
Wildfire	Reduce impact of wildland fire to infrastructure	Uniform evacuation process (road construction/improvement)	6	To Be Developed	To Be Developed	To Be Developed

**How the Mitigation Actions Identified Address Existing and New Buildings and Infrastructure**

The matrices on the following pages cross reference the proposed mitigation actions enumerated above to the specific hazards, buildings, and infrastructure that are addressed by the actions. Development and land use changes are minimal throughout the County and within the cities of the County.

The cities of *Chico* and *Oroville* are the only two jurisdictions that have planned or future New Building Infrastructure identified within the County.

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**How the Mitigation Actions Identified Address Existing and New Buildings and Infrastructure**

Butte County	Existing Infrastructure						
	Electrical and Power Infrastructure	Dams and Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures
<p><b>Wildfire Goal 1:</b> Reduce impact of wildland fire to infrastructure</p> <p><b>Wildfire Mitigation Action Plan</b></p> <p>a. Continued fuel reduction program</p> <p>b. Road / bridge construction for access</p> <p>c. Uniform weed abatement across the County (uniform enforcement and fees for services)</p> <p>d. Adoption of construction codes for the use of more fire resistant building materials</p> <p>e. Uniform evacuation process (road construction / improvement)</p> <p>f. Expansion / improvement of water supply, hydrants, etc.</p> <p>g. Tankers, lookouts, hand crews</p>	X	X	X	X	X	X	X
<p><b>Flooding Goal 1:</b> Protect infrastructure and agriculture from long-term risks of flood</p> <p><b>Flooding Mitigation Action Plan</b></p> <p>a. Increase the Butte Creek, Cherokee Levee levels for 100 year flood plan protection</p> <p>b. Rock Creek and Keifer Slough flood control project (started and stalled)</p> <p>c. 3B's overflow facility construction</p> <p>d. Palermo-technical assessment</p> <p>e. DWR maintenance of flood control channels</p> <p>f. Protect critical County infrastructure (i.e. relocate EOC) and records</p>	X	X	X	X	X	X	X
<p><b>Earthquake Goal 1:</b> To mitigate access issues and improve survivability</p> <p><b>Earthquake Mitigation Action Plan:</b></p> <p>a. Encourage water districts to improve all infrastructure</p> <p>b. Increase public preparedness awareness</p> <p>c. Critical facilities brought up to current building standards</p>	X	X	X	X	X	X	X

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Butte County	Existing Infrastructure						
	Electrical and Power Infrastructure	Dams and Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures
<p><b>Landslide Goal 1:</b> Identify and inventory areas prone to the risk</p> <p><b>Landslide Mitigation Action Plan:</b></p> <p>a. Develop aerial photography and mapping library that can allow identification of vulnerable areas prior to building permits</p> <p>b. Build elevation models</p> <p>c. Evaluate road run-off and correct where necessary</p> <p>d. Evaluate water delivery system vulnerability (open ditches) and mitigate</p>	X	X	X	X	X	X	X
<p><b>Extreme Weather Goal 1:</b> Improve public notification process / system and mitigate risks</p> <p><b>Extreme Weather Mitigation Action Plan:</b></p> <p>a. Common County early warning system</p>	X	X	X	X	X	X	X
<p><b>Dam Failure Goal 1:</b> Improve public notification and evacuation programs</p> <p><b>Dam Failure Mitigation Action Plan:</b></p> <p>a. Common County notification system</p> <p>b. Develop integrated, county-wide evacuation and sheltering plan</p>	X	X	X	X	X	X	X
<p><b>Volcano Goal 1:</b> Increase the responsiveness to a volcanic event</p> <p><b>Volcano Mitigation Action Plan:</b></p> <p>a. Expand integrated evacuation plan to address the unique situation of volcanic eruption</p>	X	X	X	X	X	X	X

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Butte County	Existing Infrastructure						
	Electrical and Power Infrastructure	Dams and Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures
<p><b>Hazardous Materials Incidents Goal 1:</b> Minimize the impact of a Haz Mat incident</p> <p><b>Hazardous Materials Incidents Action Plan:</b> a. Develop an updated evacuation / notification plan</p>	X	X	X	X	X	X	X
<p><b>Insect Infestation Goal 1:</b> Increase detection and prevention of insect infestation</p> <p><b>Insect Infestation Mitigation Action Plan:</b> a. Implement an education program for nursery owners, orchards and the public b. Augment detection programs to include flea markets, pet stores, exotic markets, parcel services and other pathways c. Augment weed management program including increasing weed-free forage and eradication of weeds by biological, cultural, chemical and other means</p>						X	
<p><b>Naturally-Occurring Biological Threats Goal 1:</b> Increase detection, preparedness and responsiveness to potential biological threats</p> <p><b>Naturally Occuring Biological Threats Mitigation Action Plan:</b> a. Expand program of food and food service business inspections b. Conduct more frequent biological incident response drills and exercises c. Enhance the screening program for pets, plants, and produce entering the County to protect the County's ecosystem and highly vulnerable agricultural industry d. Augment detection programs to include flea markets, pet stores, exotic markets, parcel services and other pathways</p>		X				X	
<p><b>Terrorism Goal 1:</b> Increase deterrence and prevention measures</p> <p><b>Terrorism Action Plan:</b> a. Educate citizenry for protection / prevention b. Harden critical infrastructure (e.g. EOC)</p>	X	X	X	X	X	X	X

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**b. City of Biggs**

<b>Hazard</b>	<b>Goal / Strategy</b>	<b>Action</b>	<b>Priority</b>	<b>Responsible Party</b>	<b>Timeframe</b>	<b>Cost</b>
Flooding	Protect infrastructure and agriculture from long-term risks of flood	Increase the Butte Creek, Cherokee Levee levels for 100 year flood plan protection	1	To Be Developed	To Be Developed	To Be Developed
Flooding	Protect infrastructure and agriculture from long-term risks of flood	Feather River flood control project - based on current assessment	2	To Be Developed	To Be Developed	To Be Developed
Flooding	Protect infrastructure and agriculture from long-term risks of flood	Flood mitigation plan for Afterbay and Forebay	3	To Be Developed	To Be Developed	To Be Developed

**How the Mitigation Actions Identified Address Existing and New Buildings and Infrastructure**

The matrices on the following pages cross references the proposed mitigation actions enumerated above to the specific hazards, buildings, and infrastructure that are addressed by the actions. Development and land use changes are minimal throughout the County and within the cities of the County.

The cities of Chico and Oroville are the only two jurisdictions that have planned or future New Building Infrastructure identified within the County.

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**How the Mitigation Actions Identified Address Existing Infrastructure (No New Buildings and Infrastructure to Report)**

Biggs	Existing Infrastructure						
	Electrical and Power Infrastructure	Dams and Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures
<b>Wildfire Goal 1:</b> Reduce impact of wildland fire to infrastructure  <b>Wildfire Mitigation Action Plan</b> a. None							
<b>Flooding Goal 1:</b> Protect infrastructure and agriculture from long-term risks of flood  <b>Flooding Mitigation Action Plan</b> a. Increase the Butte Creek, Cherokee Levee levels for 100 year flood plan protection b. Feather River flood control project - based on current assessment c. Flood mitigation plan for Afterbay and Forebay d. Protect critical County infrastructure (i.e. relocate EOC) and records	X	X	X	X	X	X	X
<b>Earthquake Goal 1:</b> To mitigate access issues and improve survivability  <b>Earthquake Mitigation Action Plan:</b> a. None							

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Biggs	Existing Infrastructure						
	Electrical and Power Infrastructure	Dams and Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures
<p><b>Landslide Goal 1:</b> Identify and inventory areas prone to the risk</p> <p><i>Landslide Mitigation Action Plan:</i>  a. Develop aerial photography and mapping library that can allow identification of vulnerable areas prior to building permits  b. Build elevation models</p>	X	X	X	X	X	X	X
<p><b>Extreme Weather Goal 1:</b> Improve public notification process / system and mitigate risks</p> <p><i>Extreme Weather Mitigation Action Plan:</i>  a. Common County early warning system</p>	X	X	X	X	X	X	X
<p><b>Dam Failure Goal 1:</b> Improve public notification and evacuation programs</p> <p><i>Dam Failure Mitigation Action Plan:</i>  a. Common County notification system  b. Develop integrated, county-wide evacuation and sheltering plan</p>	X	X	X	X	X	X	X
<p><b>Volcano Goal 1:</b> Increase the responsiveness to a volcanic event</p> <p><i>Volcano Mitigation Action Plan:</i>  a. None</p>							

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Biggs	Existing Infrastructure						
	Electrical and Power Infrastructure	Dams and Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures
<p><b>Hazardous Materials Incidents Goal 1:</b> Minimize the impact of a Haz Mat incident</p> <p><i>Hazardous Materials Incidents Action Plan:</i></p> <p>a. None</p>							
<p><b>Insect Infestation Goal 1:</b> Increase detection and prevention of insect infestation</p> <p><i>Insect Infestation Mitigation Action Plan:</i></p> <p>a. None</p>							
<p><b>Naturally-Occurring Biological Threats Goal 1:</b> Increase detection, preparedness and responsiveness to potential biological threats</p> <p><i>Naturally Occuring Biological Threats Mitigation Action Plan:</i></p> <p>a. Expand program of food and food service business inspections</p> <p>b. Conduct more frequent biological incident response drills and exercises</p> <p>c. Enhance the screening program for pets, plants, and produce entering the County to protect the County's ecosystem and highly vulnerable agricultural industry</p> <p>d. Augment detection programs to include flea markets, pet stores, exotic markets, parcel services and other pathways</p>		X				X	
<p><b>Terrorism Goal 1:</b> Increase deterrence and prevention measures</p> <p><i>Terrorism Action Plan:</i></p> <p>a. Educate citizenry for protection / prevention</p> <p>b. Harden critical infrastructure (e.g. EOC)</p>	X	X	X	X	X	X	X

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**c. City of Chico**

<b>Hazard</b>	<b>Goal / Strategy</b>	<b>Action</b>	<b>Priority</b>	<b>Responsible Party</b>	<b>Timeframe</b>	<b>Cost</b>
Extreme Weather	Improve public notification process / system and mitigate risks	Common County early warning system	1	To Be Developed	To Be Developed	To Be Developed
Flooding	Protect downtown Chico and University	Little Chico Creek study; protection for 100 year flood	2	To Be Developed	To Be Developed	To Be Developed
Flooding	Protect downtown Chico and University	Provide additional stormwater retention	3	To Be Developed	To Be Developed	To Be Developed
Flooding	Protect downtown Chico and University	Restore capacity of existing flood control features	4	To Be Developed	To Be Developed	To Be Developed
Wildfire	Reduce impact of wildland fire to infrastructure	Water service to areas being annexed	5	To Be Developed	To Be Developed	To Be Developed

**How the Mitigation Actions Identified Address Existing and New Buildings and Infrastructure**

The matrices on the following pages cross references the proposed mitigation actions enumerated above to the specific hazards, buildings, and infrastructure that are addressed by the actions. Development and land use changes are minimal throughout the County and within the cities of the County.

The cities of Chico and Oroville are the only two jurisdictions that have planned or future New Building Infrastructure identified within the County.

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**How the Mitigation Actions Identified Address Existing and New Buildings and Infrastructure**

Chico	Existing Infrastructure							New Infrastructure		
	Electrical and Power Infrastructure	Dams and Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures	Water Treatment Plant	Commercial Retail	Fire Stations
<b>Wildfire Goal 1:</b> Reduce impact of wildland fire to infrastructure  <b>Wildfire Mitigation Action Plan</b> <i>a. Road / bridge construction for access</i> <i>b. Water service to areas being annexed</i> <i>c. Fire Lookouts</i>	X	X	X	X	X	X	X	X	X	X
<b>Flooding Goal 1:</b> Protect downtown Chico and University  <b>Flooding Mitigation Action Plan</b> <i>a. Little Chico Creek study; protection for 100 year flood</i> <i>b. Provide additional stormwater retention</i> <i>c. Restore capacity of existing flood control features</i> <i>d. Protect critical County infrastructure (i.e. relocate EOC) and records</i>	X	X	X	X	X	X	X	X	X	X
<b>Earthquake Goal 1:</b> To mitigate access issues and improve survivability  <b>Earthquake Mitigation Action Plan:</b> <i>a. Additional funding for retro fitting / URM replacement</i> <i>b. Critical facilities brought up to current building standards</i>	X	X	X	X	X	X	X	X		X

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Chico	Existing Infrastructure							New Infrastructure		
	Electrical and Power Infrastructure	Dams and Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures	Water Treatment Plant	Commercial Retail	Fire Stations
<b>Landslide Goal 1:</b> Identify and inventory areas prone to the risk  <b>Landslide Mitigation Action Plan:</b> <i>a. Develop aerial photography and mapping library that can allow identification of vulnerable areas prior to building permits</i> <i>b. Build elevation models</i>	X	X	X	X	X	X	X	X	X	X
<b>Extreme Weather Goal 1:</b> Improve public notification process / system and mitigate risks  <b>Extreme Weather Mitigation Action Plan:</b> <i>a. Common County early warning system</i>	X	X	X	X	X	X	X	X	X	X
<b>Dam Failure Goal 1:</b> Improve public notification and evacuation programs  <b>Dam Failure Mitigation Action Plan:</b> <i>a. Common County notification system</i> <i>b. Develop integrated, county-wide evacuation and sheltering plan</i>	X	X	X	X	X	X	X	X	X	X
<b>Volcano Goal 1:</b> Increase the responsiveness to a volcanic event  <b>Volcano Mitigation Action Plan:</b> <i>a. None</i>										

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Chico	Existing Infrastructure							New Infrastructure		
	Electrical and Power Infrastructure	Dams and Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures	Water Treatment Plant	Commercial Retail	Fire Stations
<p><b>Hazardous Materials Incidents Goal 1:</b> Minimize the impact of a Haz Mat incident</p> <p><b>Hazardous Materials Incidents Action Plan:</b> a. Build a below-grade railroad crossing in downtown</p>	X		X	X			X	X	X	X
<p><b>Insect Infestation Goal 1:</b> Increase detection and prevention of insect infestation</p> <p><b>Insect Infestation Mitigation Action Plan:</b> a. None</p>										
<p><b>Naturally-Occurring Biological Threats Goal 1:</b> Increase detection, preparedness and responsiveness to potential biological threats</p> <p><b>Naturally Occuring Biological Threats Mitigation Action Plan:</b> a. Expand program of food and food service business inspections b. Conduct more frequent biological incident response drills and exercises c. Enhance the screening program for pets, plants, and produce entering the County to protect the County's ecosystem and highly vulnerable agricultural industry d. Augment detection programs to include flea markets, pet stores, exotic markets, parcel services and other pathways</p>		X				X		X		
<p><b>Terrorism Goal 1:</b> Increase deterrence and prevention measures</p> <p><b>Terrorism Action Plan:</b> a. Educate citizenry for protection / prevention b. Harden critical infrastructure (e.g. EOC)</p>	X	X	X	X	X	X	X	X	X	X

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**d. City of Gridley**

<b>Hazard</b>	<b>Goal / Strategy</b>	<b>Action</b>	<b>Priority</b>	<b>Responsible Party</b>	<b>Timeframe</b>	<b>Cost</b>
Dam Failure	Improve public notification and evacuation programs	Common County notification system	1	To Be Developed	To Be Developed	To Be Developed
Dam Failure	Improve public notification and evacuation programs	Develop integrated, county-wide evacuation and sheltering plan	2	To Be Developed	To Be Developed	To Be Developed
Flooding	Protect infrastructure and agriculture from long-term risks of flood	Feather River Levee Reinforcement	3	To Be Developed	To Be Developed	To Be Developed
Flooding	Protect infrastructure and agriculture from long-term risks of flood	Reinforce City Infrastructure adjacent to Feather River (Sewer Plant / Facilities)	4	To Be Developed	To Be Developed	To Be Developed
Flooding	Protect infrastructure and agriculture from long-term risks of flood	Improve drainage system	5	To Be Developed	To Be Developed	To Be Developed

**How the Mitigation Actions Identified Address Existing and New Buildings and Infrastructure**

The matrices on the following pages cross references the proposed mitigation actions enumerated above to the specific hazards, buildings, and infrastructure that are addressed by the actions. Development and land use changes are minimal throughout the County and within the cities of the County.

The cities of Chico and Oroville are the only two jurisdictions that have planned or future New Building Infrastructure identified within the County.

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**How the Mitigation Actions Identified Address Existing Infrastructure (No New Buildings and Infrastructure to Report)**

Gridley	Existing Infrastructure						
	Electrical and Power Infrastructure	Dams and Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures
<b>Wildfire Goal 1:</b> Reduce impact of wildland fire to infrastructure  <b>Wildfire Mitigation Action Plan</b> <i>a. None</i>							
<b>Flooding Goal 1:</b> Protect infrastructure and residents from long-term risks of flood  <b>Flooding Mitigation Action Plan</b> <i>a. Feather River Levee Reinforcement</i> <i>b. Reinforce City Infrastructure adjacent to Feather River (Sewer Plant / Facilities)</i> <i>c. Improve drainage system</i> <i>d. Protect critical County infrastructure (i.e. relocate EOC) and records</i>	X	X	X	X	X	X	X
<b>Earthquake Goal 1:</b> To mitigate access issues and improve survivability  <b>Earthquake Mitigation Action Plan:</b> <i>a. Additional funding for retro fitting / URM replacement</i> <i>b. Critical facilities brought up to current building standards</i>	X	X	X	X	X	X	X

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Gridley	Existing Infrastructure						
	Electrical and Power Infrastructure	Dams and Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures
<p><b>Landslide Goal 1:</b> Identify and inventory areas prone to the risk</p> <p><i>Landslide Mitigation Action Plan:</i></p> <p>a. Develop aerial photography and mapping library that can allow identification of vulnerable areas prior to building permits</p> <p>b. Build elevation models</p>	X	X	X	X	X	X	X
<p><b>Extreme Weather Goal 1:</b> Improve public notification process / system and mitigate risks</p> <p><i>Extreme Weather Mitigation Action Plan:</i></p> <p>a. Common County early warning system</p>	X	X	X	X	X	X	X
<p><b>Dam Failure Goal 1:</b> Improve public notification and evacuation programs</p> <p><i>Dam Failure Mitigation Action Plan:</i></p> <p>a. Common County notification system</p> <p>b. Develop integrated, county-wide evacuation and sheltering plan</p>	X	X	X	X	X	X	X
<p><b>Volcano Goal 1:</b> Increase the responsiveness to a volcanic event</p> <p><i>Volcano Mitigation Action Plan:</i></p> <p>a. None</p>							

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Gridley	Existing Infrastructure						
	Electrical and Power Infrastructure	Dams and Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures
<p><b>Hazardous Materials Incidents Goal 1:</b> Minimize the impact of a Haz Mat incident</p> <p><i>Hazardous Materials Incidents Action Plan:</i></p> <p>a. None</p>							
<p><b>Insect Infestation Goal 1:</b> Increase detection and prevention of insect infestation</p> <p><i>Insect Infestation Mitigation Action Plan:</i></p> <p>a. None</p>							
<p><b>Naturally-Occurring Biological Threats Goal 1:</b> Increase detection, preparedness and responsiveness to potential biological threats</p> <p><i>Naturally Occuring Biological Threats Mitigation Action Plan:</i></p> <p>a. Expand program of food and food service business inspections</p> <p>b. Conduct more frequent biological incident response drills and exercises</p> <p>c. Enhance the screening program for pets, plants, and produce entering the County to protect the County's ecosystem and highly vulnerable agricultural industry</p> <p>d. Augment detection programs to include flea markets, pet stores, exotic markets, parcel services and other pathways</p>		X				X	
<p><b>Terrorism Goal 1:</b> Increase deterrence and prevention measures</p> <p><i>Terrorism Action Plan:</i></p> <p>a. Educate citizenry for protection / prevention</p> <p>b. Harden critical infrastructure (e.g. EOC)</p>	X	X	X	X	X	X	X

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**e. City of Oroville**

<b>Hazard</b>	<b>Goal / Strategy</b>	<b>Action</b>	<b>Priority</b>	<b>Responsible Party</b>	<b>Timeframe</b>	<b>Costs</b>
Dam Failure	Improve public notification and evacuation programs	Common County notification system	1	To Be Developed	To Be Developed	To Be Developed
Flooding	Protect infrastructure from long-term risks of flood	Improvement of retention basins	2	To Be Developed	To Be Developed	To Be Developed
Flooding	Protect infrastructure from long-term risks of flood	Protect commercial infrastructure by improving storm runoff system	3	To Be Developed	To Be Developed	To Be Developed
Wildfire	Reduce impact of wildland fire to infrastructure	Water service to areas being annexed	4	To Be Developed	To Be Developed	To Be Developed
Wildfire	Reduce impact of wildland fire to infrastructure	Weed Abatement-extension into new areas	5	To Be Developed	To Be Developed	To Be Developed

**How the Mitigation Actions Identified Address Existing and New Buildings and Infrastructure**

The matrices on the following pages cross references the proposed mitigation actions enumerated above to the specific hazards, buildings, and infrastructure that are addressed by the actions. Development and land use changes are minimal throughout the County and within the cities of the County.

The cities of Chico and Oroville are the only two jurisdictions that have planned or future New Building Infrastructure identified within the County.

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**How the Mitigation Actions Identified Address Existing and New Buildings and Infrastructure**

Oroville	Existing Infrastructure							New Infrastructure	
	Electrical and Power Infrastructure	Dams and Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures	Residential Development	Commercial Retail
<p><b>Wildfire Goal 1:</b> Reduce impact of wildland fire to infrastructure</p> <p><i>Wildfire Mitigation Action Plan</i></p> <p>a. Road / bridge construction for access</p> <p>b. Water service to areas being annexed</p> <p>c. Fire Lookouts</p> <p>d. Weed Abatement-extension into new areas</p>	X	X	X	X	X	X	X	X	X
<p><b>Flooding Goal 1:</b> Protect infrastructure from long-term risks of flood</p> <p><i>Flooding Mitigation Action Plan</i></p> <p>a. Protect commercial infrastructure by improving storm runoff system</p> <p>b. Improvement of retention basins</p> <p>c. Protect critical County infrastructure (i.e. relocate EOC) and records</p>	X	X	X	X	X	X	X	X	X
<p><b>Earthquake Goal 1:</b> To mitigate access issues and improve survivability</p> <p><i>Earthquake Mitigation Action Plan:</i></p> <p>a. Additional funding for retro fitting / URM replacement</p> <p>b. Critical facilities brought up to current building standards</p>	X	X	X	X	X	X	X	X	

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Oroville	Existing Infrastructure							New Infrastructure	
	Electrical and Power Infrastructure	Dams and Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures	Residential Development	Commercial Retail
<p><b>Landslide Goal 1:</b> Identify and inventory areas prone to the risk</p> <p><b>Landslide Mitigation Action Plan:</b>  a. Develop aerial photography and mapping library that can allow identification of vulnerable areas prior to building permits  b. Build elevation models</p>	X	X	X	X	X	X	X	X	X
<p><b>Extreme Weather Goal 1:</b> Improve public notification process / system and mitigate risks</p> <p><b>Extreme Weather Mitigation Action Plan:</b>  a. Common County early warning system</p>	X	X	X	X	X	X	X	X	X
<p><b>Dam Failure Goal 1:</b> Improve public notification and evacuation programs</p> <p><b>Dam Failure Mitigation Action Plan:</b>  a. Common County notification system  b. Develop integrated, county-wide evacuation and sheltering plan</p>	X	X	X	X	X	X	X	X	X
<p><b>Volcano Goal 1:</b> Increase the responsiveness to a volcanic event</p> <p><b>Volcano Mitigation Action Plan:</b>  a. None</p>									

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Oroville	Existing Infrastructure							New Infrastructure	
	Electrical and Power Infrastructure	Dams and Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures	Residential Development	Commercial Retail
<p><b>Hazardous Materials Incidents Goal 1:</b> Minimize the impact of a Haz Mat incident</p> <p><i>Hazardous Materials Incidents Action Plan:</i></p> <p>a. None</p>									
<p><b>Insect Infestation Goal 1:</b> Increase detection and prevention of insect infestation</p> <p><i>Insect Infestation Mitigation Action Plan:</i></p> <p>a. None</p>									
<p><b>Naturally-Occurring Biological Threats Goal 1:</b> Increase detection, preparedness and responsiveness to potential biological threats</p> <p><i>Naturally Occuring Biological Threats Mitigation Action Plan:</i></p> <p>a. Expand program of food and food service business inspections</p> <p>b. Conduct more frequent biological incident response drills and exercises</p> <p>c. Enhance the screening program for pets, plants, and produce entering the County to protect the County's ecosystem and highly vulnerable agricultural industry</p> <p>d. Augment detection programs to include flea markets, pet stores, exotic markets, parcel services and other pathways</p>		X				X			
<p><b>Terrorism Goal 1:</b> Increase deterrence and prevention measures</p> <p><i>Terrorism Action Plan:</i></p> <p>a. Educate citizenry for protection / prevention</p> <p>b. Harden critical infrastructure (e.g. EOC)</p>	X	X	X	X	X	X	X	X	X

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**f. Town of Paradise**

<b>Hazard</b>	<b>Goal / Strategy</b>	<b>Action</b>	<b>Priority</b>	<b>Responsible Party</b>	<b>Timeframe</b>	<b>Cost</b>
Flooding	Protect Roadway System	Completion of Dry Creek Drainage Project (in progress)	1	To Be Developed	To Be Developed	To Be Developed
Flooding	Protect Roadway System	Completion of Berry Creek Drainage Project (in progress)	2	To Be Developed	To Be Developed	To Be Developed
Wildfire	Reduce impact of wildland fire to infrastructure	Fire Lookouts	3	To Be Developed	To Be Developed	To Be Developed
Wildfire	Reduce impact of wildland fire to infrastructure	Fuel Reduction	4	To Be Developed	To Be Developed	To Be Developed
Extreme Weather	Improve public notification process / system and mitigate risks	Ensure that critical infrastructure can withstand severe snow	5	To Be Developed	To Be Developed	To Be Developed

**How the Mitigation Actions Identified Address Existing and New Buildings and Infrastructure**

The matrices on the following pages cross references the proposed mitigation actions enumerated above to the specific hazards, buildings, and infrastructure that are addressed by the actions. Development and land use changes are minimal throughout the County and within the cities of the County.

The cities of Chico and Oroville are the only two jurisdictions that have planned or future New Building Infrastructure identified within the County.

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**How the Mitigation Actions Identified Address Existing Infrastructure (No New Buildings and Infrastructure to Report)**

Paradise	Existing Infrastructure						
	Electrical and Power Infrastructure	Dams and Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures
<b>Wildfire Goal 1:</b> Reduce impact of wildland fire to infrastructure  <b>Wildfire Mitigation Action Plan</b> <i>a. Fire Lookouts</i> <i>b. Fuel Reduction</i> <i>c. Hazard Abatement Programs</i>	X	X	X	X	X	X	X
<b>Flooding Goal 1:</b> Protect Roadway System  <b>Flooding Mitigation Action Plan</b> <i>a. Completion of Dry Creek Drainage Project (in progress)</i> <i>b. Completion of Berry Creek Drainage Project (in progress)</i> <i>c. Protect critical County infrastructure (i.e. relocate EOC) and records</i>	X	X	X	X	X	X	X
<b>Earthquake Goal 1:</b> To mitigate access issues and improve survivability  <b>Earthquake Mitigation Action Plan:</b> <i>a. Critical facilities brought up to current building standards</i>	X	X	X	X	X	X	X

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Paradise	Existing Infrastructure						
	Electrical and Power Infrastructure	Dams and Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures
<p><b>Landslide Goal 1:</b> Identify and inventory areas prone to the risk</p> <p><i>Landslide Mitigation Action Plan:</i></p> <p>a. Develop aerial photography and mapping library that can allow identification of vulnerable areas prior to building permits</p> <p>b. Build elevation models</p>	X	X	X	X	X	X	X
<p><b>Extreme Weather Goal 1:</b> Improve public notification process / system and mitigate risks</p> <p><i>Extreme Weather Mitigation Action Plan:</i></p> <p>a. Ensure that critical infrastructure can withstand severe snow</p> <p>b. Common County early warning system</p>	X	X	X	X	X	X	X
<p><b>Dam Failure Goal 1:</b> Improve public notification and evacuation programs</p> <p><i>Dam Failure Mitigation Action Plan:</i></p> <p>a. Common County notification system</p> <p>b. Develop integrated, county-wide evacuation and sheltering plan</p>	X	X	X	X	X	X	X
<p><b>Volcano Goal 1:</b> Increase the responsiveness to a volcanic event</p> <p><i>Volcano Mitigation Action Plan:</i></p> <p>a. None</p>							

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Paradise	Existing Infrastructure						
	Electrical and Power Infrastructure	Dams and Water Management	Communication Facilities	Critical Roads	Bridges and Dams	Agricultural Infrastructure	Public Structures
<b>Hazardous Materials Incidents Goal 1:</b> Minimize the impact of a Haz Mat incident  <b>Hazardous Materials Incidents Action Plan:</b> <i>a. None</i>							
<b>Insect Infestation Goal 1:</b> Increase detection and prevention of insect infestation  <b>Insect Infestation Mitigation Action Plan:</b> <i>a. None</i>							
<b>Naturally-Occurring Biological Threats Goal 1:</b> Increase detection, preparedness and responsiveness to potential biological threats  <b>Naturally Occuring Biological Threats Mitigation Action Plan:</b> <i>a. None</i>							
<b>Terrorism Goal 1:</b> Increase deterrence and prevention measures  <b>Terrorism Action Plan:</b> <i>a. Educate citizenry for protection / prevention</i> <i>b. Harden critical infrastructure (e.g. EOC)</i>	X	X	X	X	X	X	X

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**7. County Assets at Risk**

**List of Jurisdiction's Assets at Risk for All Applicable Hazards**

(Including Location and Potential Dollar Losses)

(Methodology used to prepare estimates: Assessor's values, replacement costs, insurance coverage, estimated costs based on recent construction procurements and/or local standard construction costs per square foot. \*Road damage estimates are based on a per site cost figure, with each site covering an estimate road length of 2 to 300 feet. Each road may experience multiple damaged sites from one hazard event, or multiple roads may experience one event each. There is no way to make an accurate estimate of the potential limits one hazard may cause.) % denotes the approximate damage / loss to the identified asset as a result of each relevant hazard. The method used to establish each % was to logically assess the practical extent of loss or damage to each asset as balanced by the vulnerability of the asset to each hazard.

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Type	Name	Latitude	Longitude	Estimated Potential Loss	Wildfire	Flooding	Earthquake	Landslide	Extreme Weather	Dam Failure	Volcano	Haz Mat Incidents	Insect Infestations	Natural Bio Threats	Terrorism
Airport	Richvale Airport	39.493837	-121.780586	Various	50%	50%	15%	10%	25%	50%	50%	25%		25%	25%
Bridge	Pulga Road at Flea Valley	39.8041667	-121.451111	\$ 730,000	20%	20%	1%	20%	10%	20%	20%	50%			50%
Bridge	Butte Creek Bridge at Midway	39.604444	-121.7841667	\$ 12,500,000	20%	20%	1%	20%	10%	20%	20%	50%			50%
Bridge	Bridge at Humbert Road & Colby Creek	40.1113889	-121.4855556	\$ 650,000	20%	20%	1%	20%	10%	20%	20%	50%			50%
Bridge	Cherokee Bridge at Nelson Shippee Rd	39.5377778	-121.7069444	\$ 1,700,000	20%	20%	1%	20%	10%	20%	20%	50%			50%
Bridge	Honey Run Covered Bridge	39.7291667	-121.703333	\$ 2,100,000	20%	20%	1%	20%	10%	20%	20%	50%			50%
Bridge	Rock Creek Dr. at Rock Creek	39.8438889	-121.8363889	\$ 1,400,000	20%	20%	1%	20%	10%	20%	20%	50%			50%
Bridge	Meridian Bridge at Mud Creek	39.4757	-121.9186111	\$ 2,100,000	20%	20%	1%	20%	10%	20%	20%	50%			50%
Bridge	Pine Creek Bridge at Wilson Landing Rd	39.79369444	-121.9941667	\$ 2,100,000	20%	20%	1%	20%	10%	20%	20%	50%			50%
Bridge	Skyway Bridge at Butte Creek	39.70444	-121.7880556	\$ 4,800,000	20%	20%	1%	20%	10%	20%	20%	50%			50%
Commercial	Blue Diamond Growers	39.71506	-121.853649	\$ 365,000		50%	15%	10%	25%	50%	15%	25%	25%	25%	15%
Commercial	Feather Falls Casino	39.2756	-121.317	\$ 25,000,000 (est)	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Commercial	Various Small Businesses	Various	Various	Various	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Comm Ctr	Charles Lynds Community Center	39.49566	-121.2786	\$ 251,484	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Comm Ctr	Forest Ranch Community Center	39.883583	-121.673243	\$ 230,000	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Emergency	CDF - Butte Fire Center	39.853686	-121.588313	\$ 500,000 (est)	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Emergency	CDF - Stirling City Volunteer Fire	39.903842	-121.52725	\$ 150,000	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Emergency	County Station #10 Butte Meadows	40.0486	-121.3201	\$ 185,993	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%

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Type	Name	Latitude	Longitude	Estimated Potential Loss	Wildfire	Flooding	Earthquake	Landslide	Extreme Weather	Dam Failure	Volcano	Haz Mat Incidents	Insect Infestations	Natural Bio Threats	Terrorism
Emergency	Fire Station #26 Butte Creek Canyon	39.4377	-121.4211	\$ 620,683	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Emergency	Fire Station #27 Butte Creek Canyon	39.4684	-121.3969	\$ 110,365	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Emergency	Fire Station #33 Upper Ridge	39.4919	-121.3547	\$ 480,905	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Emergency	Fire Station #37 Golden Feather	39.4328	-121.3137	\$ 228,516	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Emergency	Fire Station #38 Concow Lake	39.4644	-121.3031	\$ 200,281	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Emergency	Fire Station #41 Nord	39.4827	-121.5451	\$ 463,324	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Emergency	Fire Station #45 Durham	39.386	-121.4795	\$ 518,653	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Emergency	Fire Station #53 Clipper Mills	39.32	-121.096	\$ 118,478	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Emergency	Fire Station #55 Bangor	39.2341	-121.2447	\$ 315,901	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Emergency	Fire Station #60 Brush Creek	39.41.46	-121.2013	\$ 62,636	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Emergency	Fire Station #61 Pioneer	39.3747	-121.223	\$ 175,112	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Emergency	Fire Station #64 Kelly Ridge	39.3083	-121.2911	\$ 483,215	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Emergency	Fire Station #66 Wyandotte	39.2735	-121.2755	\$ 354,624	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Emergency	Fire Station #71 Richvale	39.2972	-121.4477	\$ 487,254	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Emergency	Fire Station #72 Palermo	39.2616	-121.3267	\$ 93,248	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Emergency	Sheriff - County Jail	39.314602	-121.342594	\$ 18,642,702	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Emergency	Sheriff - Multi-Use Building	39.31467	-121.342038	\$ 4,254,284	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Emergency	Sheriff - Paradise Sub-Station	39.491074	-121.353176	\$ 156,261	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Emergency	Sheriff - Search & Rescue Building	39.4246	-121.474	\$ 335,649	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Government	Butte County Ag Commissioner	39.524237	-121.571059	\$ 532,471	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Government	Butte County Mosquito Abatement	39.494937	-121.609377	\$ 3,560,000	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Government	Butte County Public Works (Chico)	39.5117	-121.6092	\$ 208,570	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Government	Butte County Public Works (Paradise)	39.53292	-121.5283	\$ 219,481	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Government	Butte County Public Works (Oroville)	39.525008	-121.570868	\$ 3,557,225	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Government	Butte County Behavioral Health	39.303055	121.33	\$ 415,113	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Government	Butte County Behavioral Health	39.313621	121.341251	\$ 1,994,453	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Government	Behavioral Health - In-Patient	39.4516	-121.515	\$ 1,954,492	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Government	County Government Building	39.44125	-121.502859	\$ 611,793	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Government	County Government Building	39.215257	-121.412124	\$ 496,338	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%

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Type	Name	Latitude	Longitude	Estimated Potential Loss	Wildfire	Flooding	Earthquake	Landslide	Extreme Weather	Dam Failure	Volcano	Haz Mat Incidents	Insect Infestations	Natural Bio Threats	Terrorism
Government	County Government Building	39.314001	-121.342081	\$ 12,079,711	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Government	Facilities Services (old hospital)	39.313261	-121.3484	\$ 3,367,648	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Government	Butte County Fair Grounds	39.365863	-121.685675	\$ 8,830,145	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Government	General Services / IS	39.312952	-121.342017	\$ 2,484,332	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Government	Library - Durham	39.563	-121.4835	\$ 1,368,921	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Government	Mailroom	39.313272	-121.341354	\$ 306,619	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Government	Juvenile Hall	39.3148	-121.3411	\$ 2,774,525	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Government	Juvenile Hall	39.3147	-121.342	\$ 9,522,935	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Government	Probation Department	39.3145	-121.348	\$ 2,358,523	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Government	Housing Authority of Butte County	39.2148	-121.3848	\$ 2,516,993	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Industrial Plant	PG&E - Electrical & related facilities	Various	Various	Various	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Industrial Plant	Western Petroleum Marketers	39.4238	-121.4838	\$ 68,000	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Industrial Plant	South-Feather Water Treatment Plant	39.3041	-121.2741	\$ 85,781,697	50%	50%	15%	10%	25%	50%	15%	25%		25%	25%
Road - County	12th St	39.51108059420	-121.591534012	\$300K per site *		X	X			X	X	X			X
Road - County	7 Mile Ln	39.58186609960	-121.909182456	\$300K per site *	X	X	X	X	X	X	X	X			X
Road - County	7 Mile Ln	39.58186609960	-121.909182456	\$300K per site *	X	X	X	X	X	X	X	X			X
Road - County	Afton Rd	39.42088697890	-121.798814784	\$300K per site *		X	X			X	X	X			X
Road - County	Aguas Frias Rd	39.53654385620	-121.856375078	\$300K per site *		X	X			X	X	X			X
Road - County	Biggs East Hwy	39.41517757660	-121.665773197	\$300K per site *		X	X			X	X	X			X
Road - County	Carnegie Rd	39.83718970760	-121.615447127	\$300K per site *	X	X	X	X	X	X	X	X			X
Road - County	Challenge Cut-off Rd	39.51368946060	-121.262015500	\$300K per site *	X	X	X	X	X	X	X	X			X
Road - County	Cohasset Rd	39.86322810690	-121.780172997	\$300K per site *	X	X	X	X	X	X	X	X			X
Road - County	Colter Way	39.83989836680	-121.604713933	\$300K per site *	X	X	X	X	X	X	X	X			X
Road - County	Colusa Hwy	39.36236899780	-121.805139966	\$300K per site *	X	X	X	X	X	X	X	X			X
Road - County	Creston Rd	39.82000670850	-121.601830437	\$300K per site *		X	X				X	X			X
Road - County	Dayton Rd	39.68653592320	-121.854954081	\$300K per site *	X	X	X	X	X	X	X	X			X
Road - County	Dos Rios Rd	39.42165050520	-121.656955363	\$300K per site *	X	X	X	X	X	X	X	X			X
Road - County	Durham-Dayton Hwy	39.64600509990	-121.789936308	\$300K per site *	X	X	X	X	X	X	X	X			X
Road - County	Durham-Pentz Rd	39.64558694000	-121.638909950	\$300K per site *	X	X	X	X	X	X	X	X			X

**Butte County  
Multi-Jurisdictional All Hazard  
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March 2007

Type	Name	Latitude	Longitude	Estimated Potential Loss	Wildfire	Flooding	Earthquake	Landslide	Extreme Weather	Dam Failure	Volcano	Haz Mat Incidents	Insect Infestations	Natural Bio Threats	Terrorism
Road - County	E Eaton Rd	39.77574948660	-121.861052059	\$300K per site *	X	X	X	X	X	X	X	X			X
Road - County	E Gridley Rd	39.36503552240	-121.647665107	\$300K per site *	X	X	X	X	X	X	X	X			X
Road - County	E Hamilton Rd	39.45103656620	-121.671935999	\$300K per site *		X	X			X	X	X			X
Road - County	Folsom St	39.78117118450	-121.957122127	\$300K per site *	X	X	X	X	X	X	X	X			X
Road - County	Forbestown Rd	39.50733199650	-121.358711389	\$300K per site *	X	X	X	X	X	X	X	X			X
Road - County	Glenwood Ave	39.73610781910	-121.881824994	\$300K per site *	X	X	X	X	X	X	X	X			X
Road - County	Gypsum St	39.91066489400	-121.532316662	\$300K per site *	X	X	X	X	X	X	X	X			X
Road - County	Hamilton-Nord-Cana Hwy	39.83279470360	-121.956889370	\$300K per site *	X	X	X	X	X	X	X	X			X
Road - County	Humboldt Rd	40.07960883290	-121.556359387	\$300K per site *	X	X	X	X	X	X	X	X			X
Road - County	Keefer Rd	39.81869444550	-121.877637768	\$300K per site *	X	X	X	X	X	X	X	X			X
Road - County	Kelly Ridge Rd	39.51769052440	-121.464531724	\$300K per site *	X	X	X	X	X	X	X	X			X
Road - County	Kelly Ridge Rd	39.51769052440	-121.464531724	\$300K per site *	X	X	X	X	X	X	X	X			X
Road - County	La Porte Rd	39.36034129970	-121.427410247	\$300K per site *	X	X	X	X	X	X	X	X			X
Road - County	Larkin Rd	39.41553606240	-121.643418786	\$300K per site *	X	X	X	X	X	X	X	X			X
Road - County	Lincoln Blvd	39.46986013680	-121.549337666	\$300K per site *	X	X	X	X	X	X	X	X			X
Road - County	Los Verjeles Rd	39.37944738790	-121.38633413	\$300K per site *	X	X	X			X	X	X			X
Road - County	Lumpkin La Porte Rd	39.62474992840	-121.192996207	\$300K per site *	X	X	X			X	X	X			X
Road - County	Lumpkin Rd	39.55903411130	-121.330870932	\$300K per site *	X	X	X			X	X	X			X
Road - County	Lwr Honcut Rd	39.32529222400	-121.551172347	\$300K per site *	X	X	X			X	X	X			X
Road - County	Lwr Wyandotte Rd	39.46694108000	-121.525063766	\$300K per site *	X	X	X			X	X	X			X
Road - County	Manzanita St	39.90675783740	-121.529472641	\$300K per site *	X	X	X			X	X	X			X
Road - County	Market St	39.77855240750	-121.958002296	\$300K per site *	X	X	X			X	X	X			X
Road - County	Midway	39.59171523830	-121.779500270	\$300K per site *	X	X	X			X	X	X			X
Road - County	Miners Ranch Rd	39.48583804230	-121.456494707	\$300K per site *	X	X	X			X	X	X			X
Road - County	Mt. Ida Rd	39.48749968570	-121.484817460	\$300K per site *	X	X	X			X	X	X			X
Road - County	Myers St	39.50303454780	-121.548797321	\$300K per site *	X	X	X			X	X	X			X
Road - County	Naranja Ave	39.48233879400	-121.482247502	\$300K per site *	X	X	X			X	X	X			X
Road - County	Neal Rd	39.70208363470	-121.686078096	\$300K per site *	X	X	X			X	X	X			X
Road - County	Nelson Ave	39.52571131290	-121.623645149	\$300K per site *	X	X	X			X	X	X			X

**Butte County  
Multi-Jurisdictional All Hazard  
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Type	Name	Latitude	Longitude	Estimated Potential Loss	Wildfire	Flooding	Earthquake	Landslide	Extreme Weather	Dam Failure	Volcano	Haz Mat Incidents	Insect Infestations	Natural Bio Threats	Terrorism
Road - County	Nelson Rd	39.55149089730	-121.839266694	\$300K per site *	X	X	X			X	X	X			X
Road - County	Nimshew Rd	39.84991335580	-121.608323791	\$300K per site *	X	X	X			X	X	X			X
Road - County	Nord Hwy	39.77513227450	-121.920066874	\$300K per site *	X	X	X			X	X	X			X
Road - County	Oakvale Ave	39.49718281200	-121.491827240	\$300K per site *	X	X	X			X	X	X			X
Road - County	Old Skyway	39.80725926420	-121.579446626	\$300K per site *	X	X	X			X	X	X			X
Road - County	Ophir Rd	39.46568481390	-121.552633940	\$300K per site *	X	X	X			X	X	X			X
Road - County	Ord Ferry Rd	39.63214407280	-121.926950531	\$300K per site *	X	X	X			X	X	X			X
Road - County	Oro Bangor Hwy	39.44341045440	-121.433352280	\$300K per site *	X	X	X			X	X	X			X
Road - County	Oro Quincy Hwy	39.65153238450	-121.412527379	\$300K per site *	X	X	X			X	X	X			X
Road - County	Palermo Honcut Hwy	39.38091213230	-121.539753881	\$300K per site *	X	X	X			X	X	X			X
Road - County	Palermo Rd	39.43423513300	-121.571265844	\$300K per site *	X	X	X			X	X	X			X
Road - County	Ponderosa Way	39.81586583470	-121.599233522	\$300K per site *	X	X	X			X	X	X			X
Road - County	Riceton Hwy	39.44309736620	-121.725919386	\$300K per site *	X	X	X	X	X		X	X			X
Road - County	Richvale Hwy	39.49371868950	-121.773057265	\$300K per site *	X	X	X	X	X		X	X			X
Road - County	Robinson Mill Rd	39.49330713830	-121.320488807	\$300K per site *	X	X	X	X	X		X	X			X
Road - County	Royal Oaks Dr	39.53054891060	-121.474854654	\$300K per site *	X	X	X	X	X		X	X			X
Road - County	S Park Dr	39.80612714580	-121.596281933	\$300K per site *	X	X	X	X	X		X	X			X
Road - County	Skyway	40.06397586240	-121.547963762	\$300K per site *	X	X	X	X	X		X	X			X
Road - County	Slate St	39.90809199460	-121.531382760	\$300K per site *	X	X	X	X	X		X	X			X
Road - County	Taylor St	39.77768978130	-121.956159097	\$300K per site *	X	X	X	X	X		X	X			X
Road - County	Upper Palermo Rd	39.45321715930	-121.536996353	\$300K per site *		X	X			X	X	X			X
Road - County	W Biggs Gridley Rd	39.38847256120	-121.710059714	\$300K per site *	X	X	X	X	X		X	X			X
Road - County	W Commercial St	39.77921010800	-121.956969393	\$300K per site *	X	X	X	X	X		X	X			X
Road - County	W East Ave	39.74986812520	-121.872974985	\$300K per site *	X	X	X	X	X		X	X			X
Road - County	W Hamilton Rd	39.45046869070	-121.707079344	\$300K per site *	X	X	X	X	X		X	X			X
Road - County	W Park Dr	39.80852188080	-121.602747882	\$300K per site *	X	X	X	X	X		X	X			X
Road - County	Wheelock Rd	39.63867687400	-121.593459682	\$300K per site *	X	X	X	X	X		X	X			X
Road - County	Wycliff Way	39.82854190110	-121.605294673	\$300K per site *	X	X	X	X	X		X	X			X
Road - Private	Oro Dam Blvd E	39.51682612270	-121.517219217	\$300K per site *	X	X	X			X	X	X			X

**Butte County  
Multi-Jurisdictional All Hazard  
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March 2007

**City of Biggs**

Type	Name	Latitude	Longitude	Estimated Potential Loss	Wildfire	Flooding	Earthquake	Landslide	Extreme Weather	Dam Failure	Volcano	Haz Mat Incidents	Insect Infestations	Natural Bio Threats	Terrorism
Commercial	Various Small Businesses	Various	Various	Various	75%			5%	10%	75%				10%	25%
Emergency	Biggs Police Dept	39.412876	-121.713018	Various	75%			5%	10%	75%				10%	25%
Emergency	Fire Station #73 Biggs	39.2485	-121.4248	\$ 728,091	75%			5%	10%	75%				10%	25%
Government	Memorial Hall - Biggs	39.2456	-121.426	\$ 514,204	75%			5%	10%	75%				10%	25%
Road - Biggs	2nd St	39.41643905640	-121.707374891	\$300K per site *		X	X			X	X	X			X
Road - Biggs	4th St	39.41633725650	-121.709549143	\$300K per site *		X	X			X	X	X			X
Road - Biggs	7th St	39.41527387910	-121.713314701	\$300K per site *		X	X			X	X	X			X
Road - Biggs	8th St	39.41600651300	-121.714357249	\$300K per site *		X	X			X	X	X			X
Road - Biggs	B St	39.41340365650	-121.709978552	\$300K per site *		X	X			X	X	X			X
Road - Biggs	Bannock St	39.41044797890	-121.71438686	\$300K per site *		X	X			X	X	X			X
Road - Biggs	E St	39.41598969890	-121.710793592	\$300K per site *		X	X			X	X	X			X
Road - Biggs	H St	39.41828115930	-121.712401649	\$300K per site *		X	X			X	X	X			X

**Butte County  
Multi-Jurisdictional All Hazard  
Pre-Disaster Mitigation Plan**

March 2007

**City of Chico**

Type	Name	Latitude	Longitude	Estimated Potential Loss	Wildfire	Flooding	Earthquake	Landslide	Extreme Weather	Dam Failure	Volcano	Haz Mat Incidents	Insect Infestations	Natural Bio Threats	Terrorism
Airport	Aircraft Hanger-Aero Union Corp.	39.794942	-121.851441	\$ 1,429,233	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Airport	Aircraft Hanger-Aero Union Corp.	39.804022	-121.857788	\$ 954,270	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Airport	Airport Maintenance Building	39.794968	-121.850734	\$ 114,048	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Airport	Airport Restaurant & Offices	39.797947	-121.852576	\$ 61,479	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Airport	Airport-Terminal & Runway Lighting	39.798593	-121.854913	\$ 922,500	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Airport	Electrical Vault	39.801876	-121.851129	\$ 90,000	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Airport	Ranchero Airport	39.722298	-121.872484	\$ 3,500,000	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Commercial	Chico Molding Company	39.795182	-121.850021	\$ 266,409	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Commercial	Chico Travel Services	39.798832	-121.855085	\$ 55,424	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Commercial	Various Small Businesses	Various	Various	Various	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Commercial	Retail	39.738655	-121.804878	Various	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Commercial	Retail	39.734176	-121.807519	Various	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Commercial	Retail	39.722931	-121.801777	Various	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Commercial	Retail	39.725736	-121.812477	Various	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Commercial	Retail	39.7612	-121.8152	Various	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Commercial	Retail	39.7855	-121.891	Various	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Commercial	Retail	39.7235	-121.8016	Various	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Emergency	Butte County Fire-Station 42 Chico	39.803028	-121.907003	\$ 278,350	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Emergency	Chico Fire Station # 1	39.724539	-121.837317	\$ 1,325,613	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Emergency	Chico Fire Station # 2	39.742778	-121.847544	\$ 726,923	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Emergency	Chico Fire Station # 3	39.794955	-121.850761	\$ 405,470	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Emergency	Chico Fire Station # 4	39.716887	-121.795121	\$ 600,250	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Emergency	Chico Fire Station # 5	39.760764	-121.803207	\$ 1,437,673	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Emergency	Chico Fire Station # 6 (Budgeted)	39.74284	-121.884874	\$ 4,000,000	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Emergency	Chico Fire Station # 7 (Planned)	39.7753	-121.872	\$ 5,500,000	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Emergency	Chico Police Department	39.735639	-121.815232	\$ 1,035,330	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%

**Butte County  
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Type	Name	Latitude	Longitude	Estimated Potential Loss	Wildfire	Flooding	Earthquake	Landslide	Extreme Weather	Dam Failure	Volcano	Haz Mat Incidents	Insect Infestations	Natural Bio Threats	Terrorism
Emergency	Fire Station #42 North Chico	39.463	-121.5059	\$ 3,764,132	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Emergency	Fire Training Center - Bldg & Tower	39.735677	-121.815119	\$ 500,000	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Emergency	Fuel Tanks / Pumping Equipment	39.79956	-121.85342	\$ 320,000	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Emergency	Fuel Tanks / Pumping Equipment	39.80202	-121.85774	\$ 820,000	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Emergency	Sheriff - Chico Sub-Station	39.425152	-121.482131	\$ 305,148	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Government	Boys & Girls Club Office Building	39.728051	-121.835042	\$ 609,400	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Government	Butte County Assn. of Govts.	39.735336	-121.817007	\$ 306,132	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Government	Chico Creek Nature Center	39.745503	-121.807319	\$ 289,985	50%	50%	15%	10%	10%	50%	25%	25%	25%	25%	50%
Government	Chico Museum	39.729403	-121.842781	\$ 1,178,254	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Government	City Offices	39.73589	-121.814479	\$ 890,784	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Government	Council Chamber Building	39.728884	-121.838428	\$ 2,129,087	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Government	Five Mile Dam Swimming Area	39.44479	-121.504494	\$ 248,985	50%	50%	15%	10%	10%	50%	25%	25%	25%	25%	50%
Government	Horseshoe Lake Fishing Deck	39.44479	-121.504494	\$ 150,000	50%	50%	15%	10%	10%	50%	25%	25%	25%	25%	50%
Government	Library - Chico	39.443777	-121.50303	\$ 8,071,187	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Government	Lower Bidwell Park	39.44479	-121.504494	\$ 542,076	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Government	Memorial Hall - Chico	39.441213	-121.503911	\$ 2,283,874	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Government	Memorial Hall - Chico (NEW)	39.75356	-121.85618	\$ 660,000	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Government	Municipal Building	39.728933	-121.838485	\$ 8,317,231	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Government	Municipal Services Center	39.735909	-121.817559	\$ 4,333,753	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Government	Old Municipal Building	39.728784	-121.838314	\$ 2,319,593	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Government	Parking Structure / Solar System	39.7284	-121.8414	\$ 4,597,619	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Government	Public Health Building - Chico	39.4457	-121.503061	\$ 1,093,497	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Government	Restroom	39.7311	-121.8412	\$ 95,000	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Government	Restroom / Concrete Bowl / Fence	39.726304	-121.831498	\$ 323,815	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Government	Restroom / Sum Pump / Fence	39.44479	-121.504494	\$ 41,446	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Government	Restroom / Well / Playground / Lighting	39.44479	-121.504494	\$ 317,703	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Government	Stansbury Home Museum	39.726778	-121.839962	\$ 1,001,037	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Government	Superior Court - Chico	39.444	-121.5029	\$ 1,361,998	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%

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Type	Name	Latitude	Longitude	Estimated Potential Loss	Wildfire	Flooding	Earthquake	Landslide	Extreme Weather	Dam Failure	Volcano	Haz Mat Incidents	Insect Infestations	Natural Bio Threats	Terrorism
Government	Sycamore Bath / Concession Bldg.	3944479	-121504494	\$ 122,030	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Government	Train Depot Building	39.7233	-121.8454	\$ 1,039,426	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Hospital	Enloe Homecare/Hospice	39.773139	-121.839099	\$ 2,393,000	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Hospital	Enloe Hospital	39.742318	-121.849434	\$ 35,137,000	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Hospital	Enloe Medical Center -Cohasset	39.752274	-121.847232	\$ 19,505,000	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Hospital	Enloe Outpatient Center	39.748862	-121.793197	\$ 9,048,000	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Hospital	Mangrove Medical Lab & X-Ray	39.740202	-121.83699	\$ 13,933,000	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Hospital	Med Mart/Pacific Pulmonary Services	39.746686	-121.894494	\$ 4,000,000	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Industrial Plant	Helena Chemical	39.697013	-121.780543	\$ 1,500,000	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Industrial Plant	Kinder Morgan	39.4228	-121.4845	\$ 575,000	50%	50%	15%	10%	10%	50%	25%	25%		25%	50%
Utility	Water Pollution Control Plant	39.697549	-121.917624	\$ 366,616,157	50%	50%	15%	10%	10%	50%	25%	25%	25%	25%	50%
Road - Chico	1st Ave	39.74248613410	-121.83516941	\$300K per site *		X	X			X	X	X			X
Road - Chico	Broadway	39.72802366340	-121.839368270	\$300K per site *		X	X			X	X	X			X
Road - Chico	Bruce Rd	39.73348787070	-121.787493583	\$300K per site *		X	X			X	X	X			X
Road - Chico	Chico Canyon Rd	39.75311965920	-121.793029432	\$300K per site *	X	X	X	X	X	X	X	X			X
Road - Chico	Cypress St	39.72920056110	-121.829285404	\$300K per site *		X	X				X	X			X
Road - Chico	E 1st Ave	39.74982412820	-121.825808073	\$300K per site *		X	X			X	X	X			X
Road - Chico	E 20th St	39.72700202860	-121.807134535	\$300K per site *		X	X			X	X	X			X
Road - Chico	E Lassen Ave	39.77100644270	-121.848885740	\$300K per site *		X	X			X	X	X			X
Road - Chico	E Park Ave	39.71474948840	-121.807607493	\$300K per site *		X	X			X	X	X			X
Road - Chico	East Ave	39.76095456970	-121.835201316	\$300K per site *		X	X			X	X	X			X
Road - Chico	Esplanade	39.76383374740	-121.868474664	\$300K per site *		X	X			X	X	X			X
Road - Chico	Fair St	39.71800443040	-121.816947724	\$300K per site *		X	X			X	X	X			X
Road - Chico	Floral Ave	39.76873771680	-121.829466238	\$300K per site *		X	X			X	X	X			X
Road - Chico	Holly Ave	39.75043392500	-121.869123564	\$300K per site *		X	X			X	X	X			X
Road - Chico	Longfellow Ave	39.75186892380	-121.824982682	\$300K per site *		X	X			X	X	X			X
Road - Chico	Main St	39.72808349170	-121.837761278	\$300K per site *		X	X			X	X	X			X
Road - Chico	Mangrove Ave	39.74337507470	-121.839337410	\$300K per site *		X	X			X	X	X			X
Road - Chico	Manzanita Ave	39.76131333650	-121.804540327	\$300K per site *		X	X			X	X	X			X

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Type	Name	Latitude	Longitude	Estimated Potential Loss	Wildfire	Flooding	Earthquake	Landslide	Extreme Weather	Dam Failure	Volcano	Haz Mat Incidents	Insect Infestations	Natural Bio Threats	Terrorism
Road - Chico	Marigold Ave	39.76009334780	-121.815181701	\$300K per site *		X	X			X	X	X			X
Road - Chico	Mariposa Ave	39.76116171270	-121.824615547	\$300K per site *		X	X			X	X	X			X
Road - Chico	Memorial Way	39.73341721640	-121.838975766	\$300K per site *		X	X			X	X	X			X
Road - Chico	Mulberry St	39.72361274570	-121.824585299	\$300K per site *		X	X			X	X	X			X
Road - Chico	Oroville Ave	39.72528174700	-121.834945528	\$300K per site *		X	X			X	X	X			X
Road - Chico	Park Ave	39.71946209730	-121.823529839	\$300K per site *		X	X			X	X	X			X
Road - Chico	Pine St	39.72983063790	-121.831657484	\$300K per site *		X	X			X	X	X			X
Road - Chico	Shasta Way	39.73103791180	-121.841832074	\$300K per site *		X	X			X	X	X			X
Road - Chico	Vallombrosa Ave	39.74582601740	-121.815083968	\$300K per site *		X	X			X	X	X			X
Road - Chico	W Eaton Rd	39.77018200650	-121.882929730	\$300K per site *		X	X			X	X	X			X
Road - Chico	W Sacramento Ave	39.73101005000	-121.878535666	\$300K per site *		X	X			X	X	X			X
Road - Chico	Woodland Ave	39.73293883470	-121.834778948	\$300K per site *		X	X			X	X	X			X

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**City of Gridley**

Type	Name	Latitude	Longitude	Estimated Potential Loss	Wildfire	Flooding	Earthquake	Landslide	Extreme Weather	Dam Failure	Volcano	Haz Mat Incidents	Insect Infestations	Natural Bio Threats	Terrorism
Commercial	Various Small Businesses	Various	Various	Various	10%	75%	10%	5%	15%	75%	5%	20%	25%	20%	25%
Emergency	Fire Station #74 Gridley	39.2183	-121.4109	\$ 594,420	10%	75%	10%	5%	15%	75%	5%	20%		20%	25%
Emergency	Gridley Police Dept	39.365424	-121.697374	\$ 1,300,000	10%	75%	10%	5%	15%	75%	5%	20%		20%	25%
Government	Gridley City Hall	39.365424	-121.697374	\$ 1,148,000	10%	75%	10%	5%	15%	75%	5%	20%		20%	25%
Government	Public Works - Gridley	39.213858	-121.414225	\$ 293,150	10%	75%	10%	5%	15%	75%	5%	20%		20%	25%
Government	Library - Gridley	39.215984	-121.412726	\$ 1,508,104	10%	75%	10%	5%	15%	75%	5%	20%		20%	25%
Government	Memorial Hall - Gridley	39.215202	-121.412424	\$ 1,190,855	10%	75%	10%	5%	15%	75%	5%	20%		20%	25%
Government	County Public Works Gridley Yard	39.360719	-121.694869	\$ 175,844	10%	75%	10%	5%	15%	75%	5%	20%		20%	25%
Hospital	Biggs-Gridley Memorial Hospital	39.367137	-121.690359	\$ 3,500,000	10%	75%	10%	5%	15%	75%	5%	20%		20%	25%
Hospital	La Paloma Health Center	39.363204	-121.650621	\$ 40,000	10%	75%	10%	5%	15%	75%	5%	20%		20%	25%
Road - Gridley	Hazel St	39.36458546030	-121.697216451	\$300K per site *		X	X			X	X	X			X
Road - Gridley	Magnolia St	39.36320542370	-121.690854777	\$300K per site *		X	X			X	X	X			X
Road - Gridley	Spruce St	39.36535237680	-121.698842744	\$300K per site *		X	X			X	X	X			X
Road - Gridley	Sycamore St	39.36305649270	-121.704051234	\$300K per site *		X	X			X	X	X			X
Road - Gridley	Washington St	39.36666747760	-121.694958636	\$300K per site *		X	X			X	X	X			X
Uti-Swer Plant		39.3632	-121.6879	\$ 1,800,000	10%	75%	10%	5%	15%	75%	5%	20%		20%	25%
Util-Elec Sub		39.2183	-121.4109	\$ 1,300,000	10%	75%	10%	5%	15%	75%	5%	20%		20%	25%
Util-Wtr Wells		Various	Various	\$ 600,000	10%	75%	10%	5%	15%	75%	5%	20%		20%	25%
Util-Sw Pumps		Various	Various	\$ 1,250,000	10%	75%	10%	5%	15%	75%	5%	20%		20%	25%

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**City of Oroville**

Type	Name	Latitude	Longitude	Estimated Potential Loss	Wildfire	Flooding	Earthquake	Landslide	Extreme Weather	Dam Failure	Volcano	Haz Mat Incidents	Insect Infestations	Natural Bio Threats	Terrorism
Airport	Oroville County Airport	39.49665	-121.613394	Various	50%	75%	25%	25%	20%	75%	15%	25%		25%	50%
Commercial	Various Small Businesses	Various	Various	Various	50%	75%	25%	25%	20%	75%	15%	25%	5%	25%	50%
Comm Ctr	South Oroville Community Center	39.2957	-121.3214	\$ 3,555,065	50%	75%	25%	25%	20%	75%	15%	25%		25%	50%
Emergency	El Medio Fire Dept	39.496968	-121.548521	\$ 1,253,000	50%	75%	25%	25%	20%	75%	15%	25%		25%	50%
Emergency	Oroville Police and Fire Dept	39.507345	-121.554124	\$ 526,398	50%	75%	25%	25%	20%	75%	15%	25%		25%	50%
Government	Superior Court - Oroville	39.314	-121.3425	\$ 12,157,576	50%	75%	25%	25%	20%	75%	15%	25%		25%	50%
Government	Public Works - Oroville	39.313	-121.3417	\$ 3,096,075	50%	75%	25%	25%	20%	75%	15%	25%		25%	50%
Government	Memorial Hall - Oroville	39.3057	-121.335	\$ 1,859,330	50%	75%	25%	25%	20%	75%	15%	25%		25%	50%
Government	Library - Oroville	39.3023	-121.331	\$ 4,599,802	50%	75%	25%	25%	20%	75%	15%	25%		25%	50%
Hospital	Berry Creek Health Center	39.642007	-121.424117	\$ 149,768	50%	75%	25%	25%	20%	75%	15%	25%		25%	50%
Hospital	Community Comp/Urgent Care	39.505962	-121.569967	\$ 2,300,000	50%	75%	25%	25%	20%	75%	15%	25%		25%	50%
Hospital	Oroville Hospital	39.504708	-121.542073	\$ 32,151,079	50%	75%	25%	25%	20%	75%	15%	25%		25%	50%
Utility	Oroville Sewerage Commission	39.488135	-121.563618	\$ 100,000,000	50%	75%	25%	25%	20%	75%	15%	25%		25%	50%
Road-Oroville	Bridge St	39.51312275810	-121.545027674	\$300K per site *		X	X			X	X	X			X
Road	Foothill Blvd	39.47869896810	-121.498302263	\$300K per site *	X	X	X	X	X	X	X	X			X
Road	Lincoln St	39.50855373320	-121.555046400	\$300K per site *		X	X			X	X	X			X
Road	Montgomery St	39.51329619870	-121.557767999	\$300K per site *		X	X			X	X	X			X
Road	Orange Ave	39.51719300760	-121.538790567	\$300K per site *		X	X			X	X	X			X
Road	Table Mountain Blvd	39.52039855030	-121.553158859	\$300K per site *	X	X	X	X	X		X	X			X
Road-Oroville	Washington Ave	39.51160483530	-121.547152663	\$300K per site *		X	X			X	X	X			X

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**Town of Paradise**

Type	Name	Latitude	Longitude	Estimated Potential Loss	Wildfire	Flooding	Earthquake	Landslide	Extreme Weather	Dam Failure	Volcano	Haz Mat Incidents	Insect Infestations	Natural Bio Threats	Terrorism
Airport	Paradise Skypark	39.70292	-121.618177	\$ 1,500,000	75%	75%	25%	75%	75%		25%	25%		25%	50%
Commercial	Various Small Businesses	Various	Various	Various	75%	75%	25%	75%	75%		25%	25%	5%	25%	50%
Emergency	Paradise Fire Dept. Station 1	39.753849	-121.624955	\$ 772,936	75%	75%	25%	75%	75%		25%	25%		25%	50%
Emergency	Paradise Fire Dept. Station 2	39.4456	-121.3538	\$ 297,880	75%	75%	25%	75%	75%		25%	25%		25%	50%
Emergency	Paradise Fire Dept. Station 3	39.4639	-121.362	\$ 389,973	75%	75%	25%	75%	75%		25%	25%		25%	50%
Emergency	Paradise Police Dept.	39.753189	-121.624337	\$ 1,841,606	75%	75%	25%	75%	75%		25%	25%		25%	50%
Government	Town Hall	39.4457	-121.383	\$ 2,163,313											
Government	Library - Paradise	39.452886	-121.362235	\$ 2,761,958	75%	75%	25%	75%	75%		25%	25%		25%	50%
Government	Memorial Hall - Paradise	39.453569	-121.372211	\$ 1,129,337	75%	75%	25%	75%	75%		25%	25%		25%	50%
Government	Public Works – Paradise	39.452724	-121.372149	\$ 374,354											
Government	Superior Court - Paradise	39.453569	-121.371955	\$ 817,729	75%	75%	25%	75%	75%		25%	25%		25%	50%
Hospital	Feather River Hospital	39.75648	-121.57212	\$ 45,910,739	75%	75%	25%	75%	75%		25%	25%		25%	50%
Utility	Paradise Irrigation District	39.759499	-121.620361	\$ 20,300,000	75%	75%	25%	75%	75%		25%	25%		25%	50%
Utility	Paradise Irrigation District - Yard	39.753858	-121.623629	\$ 1,300,000	75%	75%	25%	75%	75%		25%	25%		25%	50%

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## **8. Plan Maintenance**

Because the Plan is a living document that reflects the County's ongoing hazard mitigation activities, the process of monitoring, evaluating, and updating it will be critical to the effectiveness of hazard mitigation in the County.

Butte County OES has the responsibility for maintaining, evaluating, and updating the Plan. County OES has developed a method to ensure that regular review and update of its Multi-Jurisdictional All Hazard Pre-Disaster Mitigation Plan (MHMP) occurs. FEMA regulations require an update every five years. Butte County OES will utilize the Planning Committee to poll agencies to see if they want to continue to participate and if their elements of the plan are up-to-date.

Factors that will be considered in evaluating whether a Plan update or revisions are required are:

- Relevance of MHMP goals and objectives to the evolving situation in Butte County (i.e. significant changes in the landscape due to implementation of hazard mitigation projects).
- Consistency of MHMP goals and objectives with changes in state and federal laws, regulations or policies.
- Relevance of MHMP goals and objectives to current and expected conditions.
- New technologies
- New information

The risk assessment portion of the plan will be reviewed to determine if the information should be updated or modified. The parties responsible for the various implementation actions will report on:

- Status of their projects
- Implementation processes that worked well
- Any difficulties encountered
- How coordination efforts are proceeding
- Which strategies should be revised.

Butte County is committed to involving the public in the continual reshaping and updating of the MHMP. The Hazard Mitigation Plan Evaluation Committee members are responsible for the annual review and update of the plan. Although they represent the public to some extent, the public will be able to directly comment on and provide feedback about the plan.

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Butte County currently uses comprehensive land use planning, capital improvements planning, and building codes to guide and control development within the County. The hazard mitigation strategies of the Butte County General Plan, Fire Management Plan, Flood Mitigation Plan, Drought Mitigation Plan, and Safety Elements have been integrated into this MHMP. This MHMP will be provided to those responsible for the County and its participating jurisdiction's General Plan development mechanisms to insure that consistency is maintained.

The County has initiated a comprehensive update to its General Plan and Zoning Ordinance. This update is expected to take approximately three years. The five cities within the County are also in early stages of updating their General Plans. This MHMP will serve as an important document in the General Plan update processes particularly as it relates to the Seismic, Safety and related elements.

Copies of the plan will be kept on hand at County OES and the County Library. These copies of the plan will include the address and phone number of the County OES staff member responsible for tracking public comment.