

7.1 Introduction

This chapter describes the protection of public safety and property from natural and human-made hazards. Some of these hazards may be naturally occurring, such as geologic and seismic hazards. Other health and safety hazards may be the result of natural hazards, which are exacerbated by human activity and the alteration of the natural environment, such as fire hazard and development in sensitive areas such as floodplains. Additional hazards are human-made, including exposure to hazardous materials.

To assist in the development of General Plan goals and policies that protect and enhance public safety, this chapter identifies the hazards that the County may reasonably expect to face in the future.

This section is divided into the following discussions:

- Geologic and Seismic Hazards (Section 7.2)
- Air Quality (Section 7.3)
- Man-Made Hazards (Section 7.4)
- Flooding (Section 7.5)
- Urban And Wildland Fires (Section 7.6)
- Emergency Response (Section 7.7)

7.2 Geologic and Seismic Hazards

METHODS

Information in the Geologic and Seismic Hazards Section was obtained from the California Department of Conservation Division of Mines and Geology (www.consrv.ca.gov/index/index.htm), the California Geological Survey, and through review of existing Lake County planning documents.

KEY TERMS

Geologic Hazard. A geologic hazard is a physical soil condition that presents a potential danger to life and property. Geologic hazards include, but are not limited to, earthquake shaking, landslide, erosion, expansive soil, fault displacement, and volcanic eruption.

Geotechnical Report. A geotechnical report is a report prepared by a certified engineering geologist or a civil engineer practicing within the area of his or her competence, which identifies geologic and seismic hazards and

recommends mitigation measures to reduce the risk of seismic hazard to acceptable levels.

Potentially Active Faults. Potentially active faults are defined here as those faults that have affected Quaternary earth material, i.e., materials dating back two million years.

REGULATIONS THAT AFFECT GEOLOGY AND SEISMIC HAZARDS

Alquist-Priolo Earthquake Fault Zoning Act. This act requires the California Division of Mines and Geology to identify active faults and delineate earthquake fault zones within which development is to be limited due to potential seismic activity. The act further provides for increased safety from earthquakes by facilitating seismic retrofitting to strengthen buildings, including historical buildings, against ground shaking (California Public Resources Code, Division 2, Chapter 7.5, Section 2621 – 2630).

Section 65302(g), State Government Code. This law requires that general plans include a safety element, to protect communities from seismically induced hazards. The safety element is also required to include mapping of known seismic and other geologic hazards (California Government Code, Title 7 Planning and Land Use, Chapter 3 Local Planning, Article 5, Authority for and Scope of General Plans 65300 – 65307).

Seismic Hazards Mapping Act. This act requires the California Division of Mines and Geology to map seismic hazard zones and provide technical support to cities and counties to adequately prepare the safety element of their general plans. It also encourages land use management policies and regulations to reduce and mitigate seismic hazards to protect public health and safety (California Public Resources Code, Division 2, Chapter 7.8 Seismic Hazards Mapping Section 2690 – 2699.6).

ENVIRONMENTAL SETTING

The existing Lake County General Plan (1981) states that the geologic hazards occurring in Lake County were unstable slopes, ground failure, unstable soils, and volcanism. Seismic activity poses hazards to developed area in the County by ground displacement, ground failure, and ground shaking.

Unstable Slopes

The major geologic hazard facing the County is that associated with slope instability. As a slope increases in steepness, so does the potential for hazardous conditions to human life and structures situated in the area. Land having an average slope of 30 percent or greater is generally considered less suitable for intensive development because it is difficult and costly to develop and has the potential for slope instability.

Landslides induced by seismic activity, heavy rains, or construction activities (such as excavation) present a risk to human life and property located in or directly below hill areas. Due to the hilly terrain and subsurface geology of the Mesozoic Franciscan Formation, large areas along the Mayacmas Mountains and north of Highway 20 are prone to slope failure. These areas constitute slightly over 40% of the County's area. No recent landslides have been identified in the County, although the potential for failure does exist in these areas, especially in previous landslide debris areas. Areas prone to landslides require a sufficient amount of open, undeveloped space to ensure public safety.

Ground Failure

Subsidence and ground failure due to seismic activity are two potential forms of ground failure that could occur in Lake County. Subsidence is a localized downward movement of the ground surface with little horizontal movement. It is usually caused by the collapse of underground voids such as mines or caverns, by excessive groundwater withdrawals, or by extraction of oil. Subsidence may damage all types of construction, including: buildings, sewage disposal works, water pipes, gas lines, and roads.

The likelihood of local subsidence problems occurring due to extraction of geothermal resources appears remote. Substantial subsidence due to local geothermal development has not been noted to date. However, geothermal development has only occurred in areas of Lake County characterized by dry steam resources at relatively deep locations. Development of liquid dominated geothermal resources, particularly in residential and agricultural areas, would require careful monitoring to insure that subsidence problems do not occur.

Unstable Soils

Expansive soils expand in volume when wet and shrink in the process of drying. Structures built on soils having this characteristic may suffer damage if conditions exist which favor the shrink-swell phenomena. Such soils are widespread throughout the County, as over half of its area is underlain by soils classified as moderately to highly expansive. Mitigation of this hazard requires engineering and design precautions.

Soil erosion is another common form of soil instability. Erosion is a function of soil type, slope, rainfall intensity, and groundcover. It accounts for a loss in many dollars of valuable soil, is aesthetically displeasing, and often induces even greater rates of erosion and sedimentation. Sedimentation is simply the accumulation of soil as a result of erosion. Construction activities often contribute greatly to erosion and sedimentation.

Besides being a pollutant in its own right, sediment acts as a transport medium for other pollutants, especially nutrients, pesticides, and heavy

metals, which adhere to the eroded soil particles. As the sediment drains into watercourses, the combination of these pollutants adversely affects water quality. Clear Lake water quality suffers from high naturally occurring sedimentation.

Volcanism

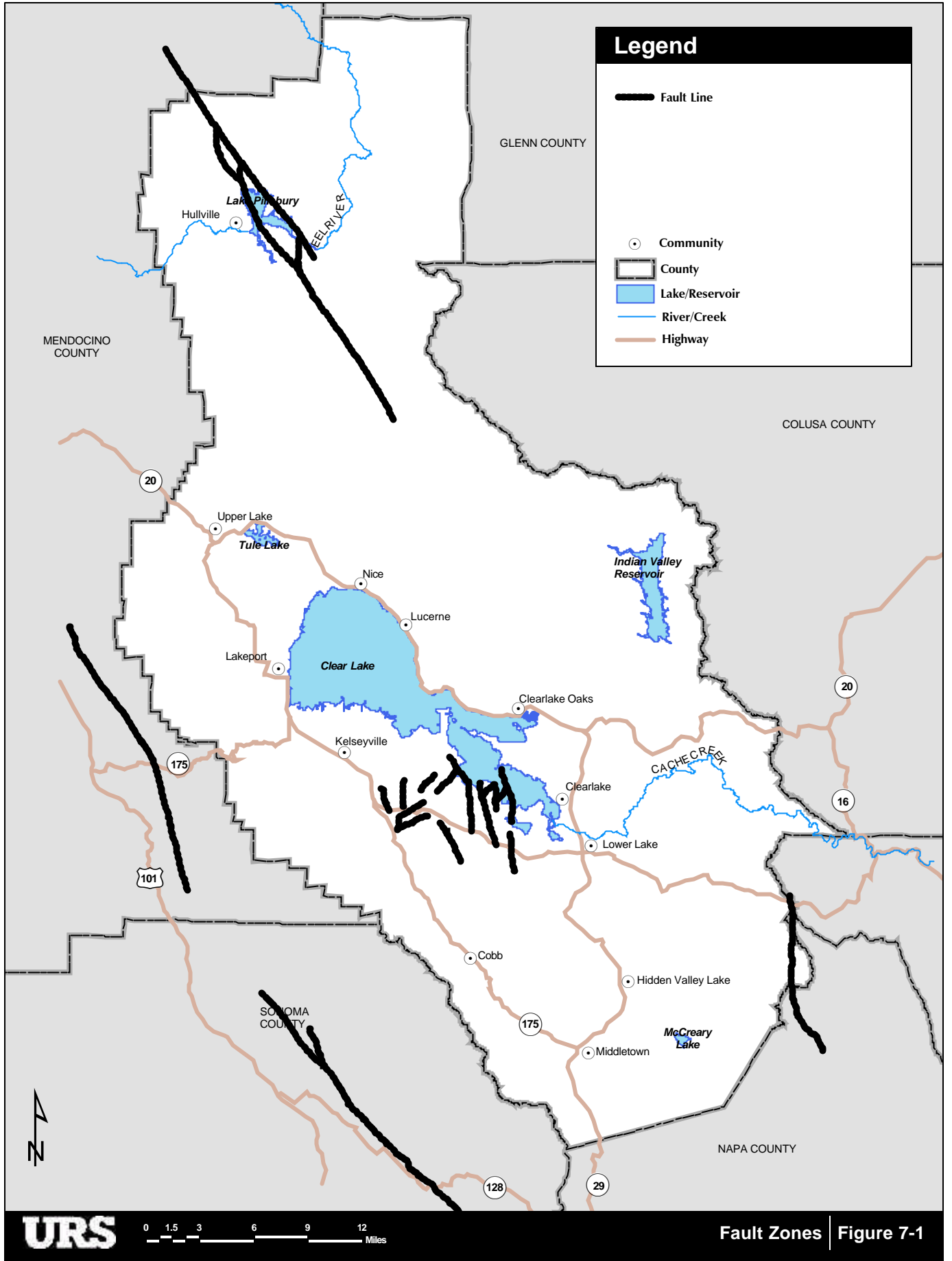
The southern half of Lake County is one of the sixteen areas in California identified as likely to experience a future volcanic eruption. Mount Konocti is the most recent, large volcano in the County. The area's well-known geothermal resources indicate further evidence of possible volcanic activity. These apparently originate in a shallow magma (molten rock) chamber.

Seismic Activity

Within the past 200 years, no major damaging earthquakes have occurred along faults in Lake County. However, numerous faults exist within the County, designated potentially active, which could cause ground rupture, failure and shaking. Precise locations of these faults are not well established. But from information available, it appears that the greatest number of faults occur in the southwestern portion of the County near Mt. Konocti. The southeastern portion of the County also appears to have considerable faults, particularly from Grizzly Peak eastward and running from Knoxville to the southern County line. The 2001 Fault-Rupture Hazard Zones maps prepared by the California Geological Survey for the Alquist-Priolo Earthquake Fault Zoning Act, shown in Figure 7-1, also identifies areas in the northern section of the County (www.consrv.ca.gov/cgs/rghm/ap/Map_index/F4A.htm#SE). The fault zone runs diagonally in a southeast to northwest direction through the Potato Hill, Lake Pillsbury and Sanhedrin typographic quad maps. In the far southeastern corner of the County there is a fault zone in the Jericho Valley, an area that runs along the Lake/Napa County line.



Additional concerns, addressed by the Lake County Air Quality Management District, pertaining to serpentine rock and the presence of asbestos are discussed in Section 7.3, "Air Quality."



Fault Zones | Figure 7-1

7.3 Air Quality

Air quality is a key consideration in maintaining the healthful and aesthetic qualities of Lake County. The maintenance of good air quality requires a balance of regulating major and minor point sources of air pollution, with good land use planning and transportation management to minimize emissions from motor vehicles, stationary sources and impacts on the public, residents, business and industry. Lake County is unique in California since it is the only County in the state, which is considered an attainment area or is unclassified for all of the federal and all of the state criteria air pollutants.

This section describes the general characteristics of air quality within the Lake County planning area. Topics covered in this section include the following:

- The current air quality as monitored by the Lake County Air Quality Management District within the County's planning area; and
- The primary sources of air pollution found within the planning area.

METHODS

The Lake County Air Quality Management District (AQMD) compiles information on current air quality and sources of air pollution. This information is periodically submitted to the California Air Resources Board (CARB), which provides oversight for air quality programs throughout the State of California. The CARB maintains a website (www.arb.ca.gov) that contains information on air quality trends and regulations. The most current information available from the CARB was used as the basis for this discussion on air quality within Lake County.

The Lake County AQMD is responsible for regulating both point and area sources of air emissions including qualifying industrial and commercial businesses, all open burning operations including agricultural, prescribed and residential burning and grading activities on serpentine surfaces. The AQMD enforces its Rules and Regulations, which implement federal and state air quality requirements, through a permit system that functions independently of the County planning process. Because the County is an attainment area (or is unclassified) for all criteria pollutants, both federal and state, it is not required to prepare an Air Quality Management Plan. Instead, the District's focus is on the prevention of significant deterioration in air quality, and this goal is pursued mainly through the District's permitting process and the regulation of point sources of air emissions. The AQMD reviews all planning and environmental documents submitted for review and comment and actively participates in the planning process where District permits are determined necessary and/or where project are otherwise subject to District regulation or a significant potential source of air emissions. New source review procedures for point source of air

emissions are followed pursuant to thresholds identified in District Regulations, however, with limited exception, any stationary source of air pollutant emissions may be required to obtain a District permit pursuant to District Regulation Chapter IV and California Public Health & Safety Code Sections 4000 and 42300. The update of the County General Plan, and the air quality evaluation within the EIR for the General Plan, will use the current information and data regarding air quality, as well as the procedures that have been used to evaluate planning projects in the past.

KEY TERMS

Ambient Air Quality Standards (AAQS). Health- and welfare-based standards for outdoor air, which identify the maximum acceptable average concentrations of air pollutants during a specified period of time. AAQS have been adopted at both the national level and the state level.

Attainment Area. A geographical area identified to have air quality as good as, or better than, the national and/or California ambient air quality standards (NAAQS/ CAAQS). An area may be an attainment area for one pollutant and a nonattainment area for others. Unclassified areas are treated as attainment areas although they may not have monitoring data for the specific air contaminant.

Best Available Control Technology (BACT). The most up-to-date methods, systems, techniques, and production processes available to achieve the greatest feasible emission reductions for given regulated air pollutants and processes. BACT is a requirement of NSR (New Source Review) and PSD (Prevention of Significant Deterioration).

California Ambient Air Quality Standard (CAAQS). A legal limit that specifies the maximum level and time of exposure in the outdoor air for a given air pollutant and which is protective of human health and public welfare (Health and Safety Code 39606b). CAAQS are recommended by the California Office of Environmental Health Hazard Assessment and adopted into regulation by the CARB. CAAQS are the standards that must be met under state law, and are more stringent than the national standards.

Criteria Air Pollutant. An air pollutant for which acceptable levels of exposure can be determined and for which an ambient air quality standard has been set. Examples include ozone, carbon monoxide, and particulate matter (PM₁₀, where the 10 designates the average diameter of the particles as 10 microns or less). The term "criteria air pollutant" derives from the requirement that the EPA must describe the characteristics and potential health and welfare effects of these pollutants. The EPA and CARB periodically review new scientific data and may propose revisions to the standards as a result.

National Ambient Air Quality Standards (NAAQS). Standards established by the United States Environmental Protection Agency (EPA) that apply to

outdoor air throughout the country. There are two types of NAAQS. Primary standards set limits to protect public health and secondary standards set limits to protect public welfare.

Prevention of Significant Deterioration (PSD). A permitting program for new and modified stationary sources of air pollution located in an area that attains or is unclassified for national ambient air quality standards (NAAQS). The PSD program is designed to ensure that air quality does not degrade beyond those air quality standards or beyond specified incremental amounts. The PSD permitting process requires new and modified facilities above a specified size threshold to be carefully reviewed prior to construction for air quality impacts. PSD also requires those facilities to apply BACT to minimize emissions of air pollutants. A public notification process is conducted prior to issuance of final PSD permits.

REGULATIONS THAT AFFECT AIR QUALITY

Federal Regulations

The Federal Clean Air Act is the federal law passed in 1970 (and last amended in 1990) that forms the basis for the national air pollution control effort. Basic elements of the act include the following:

- National ambient air quality standards for major air pollutants (See Table 7-1)
- Standards for hazardous air pollutants standards
- Requirements for states to develop plans to achieve attainment status by specific dates
- Motor vehicle emissions standards
- Stationary source emissions standards and permit procedures
- Acid rain control measures
- Stratospheric ozone protection

The federal Clean Air Act provides the EPA with the legal authority to regulate air pollution. The Clean Air Act requires the preparation and submission of State Implementation Plans for the attainment of national ambient air quality standards by established target dates. States, in conjunction with local air pollution control districts, enact regulations sufficient to attain and maintain the national ambient air quality standards.

State Regulations

California passed its own state Clean Air Act, which established the California Air Resources Board (CARB) and gave it primary responsibility for vehicular emission control, development of California ambient air quality standards (see Table 7-1), implementation of air quality research, and oversight authority for the stationary emission source programs implemented by local air pollution control districts.

Table 7-1 Ambient Air Quality Standards Applicable in California

Pollutant/ Average Time	Symbol	Standard, as parts per million		Standard, as micrograms per cubic meter		Violation criteria	
		California	National	California	National	California	National
Ozone							
8 hours	O ₃	N/A	0.08	N/A	160	N/A	If 3-year average of annual third-highest daily 8-hour maximum exceeds standard
1 hour		0.09	0.12	180	235	If exceeded	If exceeded on more than 3 days in 3 years
Carbon monoxide							
8 hours	CO	9.0	9	10,000	10,000	If exceeded	If exceeded on more than 1 day per year
1 hour		20	35	23,000	40,000	If exceeded	If exceeded on more than 1 day per year
8 hours (Lake Tahoe only)		6	N/A	7,000	N/A	If exceeded	N/A
Nitrogen dioxide							
Annual average	NO ₂	N/A	0.053	N/A	100	N/A	If exceeded
1 hour		0.25	N/A	470	N/A	If exceeded	N/A
Sulfur dioxide							
Annual average	SO ₂	N/A	0.03	N/A	80	N/A	If exceeded
24 hours		0.04	0.14	105	365	If exceeded	If exceeded on more than 1 day per year
1 hour		0.25	N/A	655	N/A	N/A	N/A
Hydrogen sulfide							
1 hour	H ₂ S	0.03	N/A	42	N/A	If equaled or exceeded	N/A
Vinyl chloride							
24 hours	C ₂ H ₃ Cl	0.010	N/A	26	N/A	If equaled or exceeded	N/A
Inhalable particulate matter							
Annual geometric mean	PM ₁₀	N/A	N/A	30	N/A	If exceeded	N/A
Annual arithmetic mean		N/A	N/A	N/A	50	N/A	If exceeded
24 hours		N/A	N/A	50	150	N/A	If exceeded on more than 1 day per year
Fine particulate matter							
Annual arithmetic mean	PM _{2.5}	N/A	N/A	N/A	15	N/A	If spatial average exceeded on more than 3 days in 3 years
24 hours		N/A	N/A	N/A	65	N/A	If exceeds 98 th percentile of concentrations in a year
Sulfate particles							
24 hours	SO ₄	N/A	N/A	25	N/A	If equaled or exceeded	N/A
Lead particles							
Calendar quarter	Pb	N/A	N/A	N/A	1.5	N/A	If exceeded no more than 1 day per year
30 days		N/A	N/A	1.5	N/A	If equaled or exceeded	N/A
Notes: All standards are based on measurements at 25°C and 1 atmosphere pressure. National standards shown are the primary (health effects) standards. N/A = not applicable.							

Most of the requirements and procedures for the CARB are set forth in the state Health and Safety Code (Division 26 starting with Section 39000), but specific requirements and enforcement provisions are found throughout the state codes.

The CARB has divided the State into “air basins” on the basis of meteorological and geographical conditions that impact air quality. Each air basin must develop an attainment plan that contains air quality monitoring data, an emission inventory and identifies how the air basin will control sources that contribute to air pollution. These plans provide the foundation for the development of air pollution regulations. Areas that are non-attainment and have significant air pollution problems tend to have more detailed and restrictive air pollution regulations. The local attainment plans are incorporated into the State Implementation Plan. Areas that are already in attainment for criteria pollutants still prepare Air Quality Management Plans that outline strategies to ensure that good air quality is maintained.

Local Regulations

The Lake County AQMD has adopted a set of Rules and Regulations that define permit requirements and procedures for the control of emissions from major stationary sources of air pollutants. Sources that are subject to these requirements include all major industrial and commercial sources of emissions, gasoline service stations, geothermal energy facilities, and agricultural and residential burning operations. Implementation of compliance with the District’s Rules and Regulations are considered the attainment plan for the Lake County Air Basin.

ENVIRONMENTAL SETTING

The Lake County Air Basin is defined to include the area of Lake County. The County is an attainment area for all NAAQS and all CAAQS. This “attainment” designation means that the County complies with all federal and state air quality standards. Table 7-2 presents a summary of selected data for the monitoring station on Lakeport Boulevard in Lakeport.

Table 7-2 Selected Air Quality Monitoring Data for Lake County

Pollutant and averaging time	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Ozone, max. 1-hour concentration (ppm)	0.080	0.080	0.080	0.090	0.070	0.090	0.080	0.080	0.090	0.080	0.070
Ozone, max. 8-hour concentration (ppm)	0.066	0.058	0.073	0.075	0.064	0.070	0.065	0.076	0.072	0.073	0.065
PM10, max. 24-hr concentration (µg/m3)	31	22	30	21	30	26	18	35	43	22	21
PM10, max. annual geometric mean (µg/m3)	11.0	11.1	9.9	10.1	9.6	9.1	7.7	6.3	10.7	9.6	6.2

Although the County is an attainment area, a review of Table 7-2 shows that on several instances since 1990 the pollutant concentrations have equaled (but not exceeded) the state standards for ozone and for particulate matter (PM10). For this reason, these two pollutants remain of concern for planning purposes.

The primary sources of air contaminants in Lake County are associated with vehicles, unpaved roads and vegetation burning (including fire places and wood stoves). Vehicles, unpaved roads, solid fuel combustion from agricultural, forest, and range management, and residential burning are major contributors of PM-10 emissions. The Geysers Geothermal Power Plants and steam production wells are also sources of air pollutants within the Lake County Air Basin.

There are also a number of areas in Lake County that contain serpentine rock and soils. These areas have been mapped and identified to contain regulated amounts of asbestos. The Middletown and Lakeport areas have serpentine lands that have been or are likely to be developed. Unless adequately mitigated, the disturbance of serpentine will release asbestos to the air and water. The District regulates serpentine in specific instances through Rule 467. However, there is a need for more public awareness of the presence of serpentine and necessary mitigation to reduce public exposure to fiber releases.

Lake County contains a mixture of industrial, commercial, agricultural, and residential land uses. This diverse mixture requires careful management of air resources. Combined with the natural drainage effects of the surrounding hills and mountains, Big Valley, including the community of Kelseyville, is subject to localized poor dispersion during portions of the year. Inversions trap the pollutants carried into the valley from remote sources as well as locally generated pollutants. These inversions occur more often and last longer in the Kelseyville and Middletown Planning Areas than in the rest of the County due to its basin topography, stagnant cold air, and location on the windward side of Mt. Konocti. The high concentration of development, and residential and agricultural burning activities, are cause for increased particulate concentrations and visibility reductions within this sub-area of the air basin.

These factors will be considered, along with other strategies in use by the Lake County AQMD, when the Land Use and Circulation elements are updated for the General Plan. The EIR for the General Plan Update will include an updated vehicle emissions inventory for the County so that the effects of anticipated increases in traffic can be identified.

7.4 Man-Made Hazards

This section discusses human-made hazards (hazardous materials and airport safety) in the County that may result in human health effects and risks associated with potential loss of life or property damage.



Additional concerns associated with accidents and crime (e.g., emergency response service calls and response times) are discussed in Chapter 5, “Public Facilities and Services.”

To provide a better understanding of the extent of existing human-made hazards within the County, this section describes:

- Federal, state, and local regulations; and
- Existing human-made hazards in Lake County

METHODS

Information presented in this section is based on printed reports and data from the Lake County Environmental Health Department.

KEY TERMS

Hazardous Materials. A hazardous material is defined by the California Code of Regulations (CCR) as a substance that, because of physical or chemical properties, quantity, concentration, or other characteristics, may either (1) cause an increase in mortality or an increase in serious, irreversible, or incapacitating, illness; or (2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported or disposed of (CCR, Title 22, Division 4.5, Chapter 10, Article 2, Section 66260.10).

Hazardous Wastes. Similarly, hazardous wastes are defined as materials that no longer have practical use, such as substances that have been discarded, discharged, spilled, contaminated, or are being stored prior to proper disposal. According to Title 22 of the CCR, hazardous materials and hazardous wastes are classified according to four properties: toxic, ignitable, corrosive, and reactive (CCR, Title 22, Chapter 11, Article 3).

Lake County Environmental Health Department. The Lake County Environmental Health Department is the local agency responsible for enforcing hazardous material and other safety-related requirements.

REGULATIONS THAT AFFECT MAN-MADE HAZARDS

The storage, use, and handling of hazardous materials by industries and businesses are subject to a number of federal, state, and local regulations. A brief overview of the primary regulations used to regulate hazardous materials and wastes is presented below.

Federal Regulations – Hazardous Materials/Wastes

The principal federal legislation is the Resource Conservation and Recovery Act (RCRA), which is administered by the United States Environmental Protection Agency (EPA). RCRA imposes reporting, permitting, and operational control requirements on those who generate, treat, store, or dispose of hazardous waste. The federal Hazardous Materials Transport Act, administered by the U.S. Department of Transportation, requires detailed manifesting and reporting of hazardous materials shipped on the U.S. highway system; it also contains packaging requirements for shipped materials. The Clean Water Act, also administered by the EPA, controls the discharge of hazardous materials or hazardous waste to waters of the U.S. or to local wastewater treatment plants.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLA, commonly referred to as Superfund, was enacted on December 11, 1980. The purpose of CERCLA was to provide authorities the ability to respond to uncontrolled releases of hazardous substances from inactive hazardous waste sites that endanger public health and the environment. CERCLA established prohibitions and requirements concerning closed and abandoned hazardous waste sites, provided for liability of persons responsible for releases of hazardous waste at such sites, and established a trust fund to provide for cleanup when no responsible party could be identified. Additionally, CERCLA provided for the revision and republishing of the National Contingency Plan (NCP) that provides the guidelines and procedures needed to respond to releases and threatened releases of hazardous substances, pollutants, or contaminants. The NCP also provides for the National Priorities List, a list of national priorities among releases or threatened releases throughout the United States for the purpose of taking remedial action.

The Superfund Amendments and Reauthorization Act (SARA). SARA amended CERCLA on October 17, 1986. This amendment increased the size of the Hazardous Response Trust Fund to \$8.5 billion, expanded EPA's response authority, strengthened enforcement activities at Superfund sites; and broadened the application of the law to include federal facilities. In addition, new provisions were added to the law that dealt with emergency planning and community right to know. SARA also required EPA to revise the Hazard Ranking System to ensure that the system accurately assesses the relative degree of risk to human health and the environment posed by sites and facilities subject to review for listing on the National Priorities List.

Resource Conservation and Recovery Act of 1976 (RCRA). RCRA is the nation's hazardous waste control law. It defines hazardous waste, provides for a cradle-to-grave tracking system and imposes stringent requirements on treatment, storage and disposal facilities. RCRA requires environmentally sound closure of hazardous waste management units at treatment, storage, and disposal facilities. The EPA is the principal agency responsible for the administration of RCRA, SARA, and CERCLA.

Occupational Safety and Health Administration (OSHA). Through the enactment of the Occupational Safety and Health Act, OSHA was obligated to prepare and enforce occupational health and safety regulations with the goal of providing employees a safe working environment. OSHA regulations apply to the work place and cover activities ranging from confined space entry to toxic chemical exposure. OSHA regulates workplace exposure to hazardous chemicals and activities through promulgating regulations specifying work place procedures and equipment.

U.S. Department of Transportation (DOT). The DOT regulates the interstate transport of hazardous materials and wastes through implementation of the Hazardous Materials Transportation Act. This act specifies driver-training requirements, load labeling procedures, and container design and safety specifications. Transporters of hazardous wastes must also meet the requirements of additional statutes such as RCRA, discussed previously.

Federal Regulations – Aviation Safety

The Federal Aviation Administration (FAA) is responsible for enforcement of Title 14 Code of Federal Regulations. Part 77 of the Federal Aviation Regulations (FAR), Objects Affecting Navigable Airspace, has been adopted as a means of monitoring and protecting the airspace required for safe operation of aircraft an airport. These regulations require that the FAA be notified of certain proposed construction or alteration of objects, whether permanent or temporary or of natural growth, within a specified vicinity of an airport. These regulations are used as the basis for height zoning an airport environment.

State Regulations – Hazardous Materials/Wastes

At the state level, state law allows state agencies to accept delegation of federal responsibility for hazardous materials and hazardous waste management. The Porter-Cologne Water Quality Control Act allows the State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Board (RWQCB) to accept implementation responsibility for the Clean Water Act. The Hazardous Waste Control Act of 1977, and recent amendments to its implementation regulations, has given the Department of Health Services (DHS) the lead role in administering the RCRA (RCRA) program. The Hazardous Substances Highway Spill Containment Act gives

the California Highway Patrol (CHP) the authority to respond to spills of hazardous materials on the state's highway system.

Hazardous Substance Account Act (1984), California Health and Safety Code Section 25300 ET SEQ (HSA). This act, known as the California Superfund, has three purposes: 1) to respond to releases of hazardous substances; 2) to compensate for damages caused by such releases; and 3) to pay the state's 10% share in CERCLA cleanups. Contaminated sites that fail to score above a certain threshold level in the EPA's ranking system may be placed on the California Superfund list of hazardous wastes requiring cleanup.

California Environmental Protection Agency (CAL/EPA). The Cal/EPA was created in 1991 to coordinate state environmental programs, reduce administrative duplication, and address the greatest environmental and health risks. Cal/EPA unifies the state's environmental authority under a single accountable, cabinet-level agency. The Secretary for Environmental Protection oversees the following agencies: Air Resources Board, Integrated Waste Management Board, Department of Pesticide Regulation, State Water Resources Control Board, Department of Toxic Substances Control, and Office of Environmental Health Hazard Assessment.

Department of Toxic Substance Control (DTSC). Cal/EPA has regulatory responsibility under Title 22 of the California Code of Regulations (CCR) for administration of the state and federal Superfund programs for the management and cleanup of hazardous materials. The DTSC is responsible for regulating hazardous waste facilities and overseeing the cleanup of hazardous waste sites in California. The Hazardous Waste Management Program (HWMP) regulates hazardous waste through its permitting, enforcement and Unified Program activities. HWMP maintains the EPA authorization to implement the RCRA program in California, and develops regulations, policies, guidance and technical assistance/training to assure the safe storage, treatment, transportation and disposal of hazardous wastes. The State Regulatory Programs Division of DTSC oversees the technical implementation of the state's Unified Program, which is a consolidation of six environmental programs at the local level, and conducts triennial reviews of Unified Program agencies to ensure their programs are consistent statewide and conform to standards. The enforcement of regulations administered by DTSC has been delegated locally to Sacramento County Environmental Management Department (SCEMD).

State Water Resources Control Board. Acting through the RWQCB, the SWRCB regulates surface and groundwater quality pursuant to the Porter-Cologne Water Quality Act, the federal Clean Water Act, and the Underground Tank Law. Under these laws, RWQCB is authorized to supervise the cleanup of hazardous wastes sites referred to it by local agencies in those situations where water quality may be affected.

Depending on the nature of contamination, the lead agency responsible for the regulation of hazardous materials at the site can be the DTSC, RWQCB, or both. DTSC evaluates contaminated sites to ascertain risks to human health and the environment. Sites can be ranked by DTSC or referred for evaluation by the RWQCB. In general, contamination affecting soil and groundwater is handled by RWQCB and contamination of soils is handled by DTSC.

California Occupational Safety and Health Administration (Cal/OSHA). Cal/OSHA and the Federal OSHA are the agencies responsible for assuring worker safety in the handling and use of chemicals in the workplace. Pursuant to the Occupational Safety and Health Act of 1970, Federal OSHA has adopted numerous regulations pertaining to worker safety, contained in the Code of Federal Regulations Title 29 (29 CFR). These regulations set standards for safe workplaces and work practices, including standards relating to hazardous material handling. Cal/OSHA assumes primary responsibility for developing and enforcing state workplace safety regulations. Because California has a federally approved OSHA program, it is required to adopt regulations that are at least as stringent as those found in 29 CFR. Cal/OSHA standards are generally more stringent than federal regulations.

Cal/OSHA regulations concerning the use of hazardous materials in the workplace, as detailed in Title 8 of the CCR, include requirements for safety training, availability of safety equipment, accident and illness prevention programs, hazardous substance exposure warnings, and emergency action and fire prevention plan preparation. Cal/OSHA enforces hazard communication program regulations that contain training and information requirements, including procedures for identifying and labeling hazardous substances, communicating hazard information related to hazardous substances and their handling, and preparation of health and safety plans to protect workers and employees at hazardous waste sites. The hazard communication program requires that Material Safety Data Sheets (MSDSs) be available to employees and that employee information and training programs be documented.

Hazardous Materials Transport. California law requires that Hazardous Waste (as defined in California Health and Safety Code Division 20, Chapter 6.5) be transported by a California registered hazardous waste transporter that meets specific registration requirements. The requirements include possession of a valid Hazardous Waste Transporter Registration, proof of public liability insurance which includes coverage for environmental restoration, and compliance with California Vehicle Code registration regulations required for vehicle and driver licensing. Additional requirements can be found in Title 22 CCR, Chapter 13.

State agencies with primary responsibility for enforcing federal and state regulations and responding to hazardous materials transportation emergencies are the CHP and Caltrans. Together, these agencies determine container types used and license hazardous waste haulers for hazardous

waste transportation on public roads. The CHP designates state and federal roadways as hazardous materials truck routes. The CHP classifies hazardous materials into three categories: explosives, poisons that can be inhaled, and radioactive material.

State Regulations – Aviation Safety

At the State level, airports are regulated under the authority of the State Aeronautics Act (Public Utility Code Sections 21670, et seq.) and the Airport Land Use Commission Law, Chapter 4, and Article 3.5, California Public Utilities Code. These laws are implemented through Airport Land Use Commissions (ALUC), which are required in every county with a public use airport or with an airport served by a scheduled airline. Under the provisions of the Law, the ALUC has certain responsibilities conferred upon it and specific duties to perform.

Local Regulations – Hazardous Materials/Wastes

Lake County Environmental Health Department. The Lake County Environmental Health Department is the local agency responsible for enforcing a variety of hazardous material, waste, safety, and other related requirements.

The Department is a Certified Unified Program Agency (CUPA). The CUPA was created by the California Legislature to minimize the number of inspections and different fees for businesses. The purpose of the CUPA program is to provide consolidation and consistency for reporting requirements, permit format, inspection criteria, enforcement standards, and fees for the following hazardous materials programs:

- Hazardous Waste Generator & Onsite Hazardous Waste Treatment
- Aboveground Storage tanks - Spill Prevention Control and Countermeasure Plan (SPCC)
- Underground Storage tanks
- Hazardous Material Release Response Plans and Inventories
- California Accidental Release Prevention Program
- Uniform Fire Code Hazardous Material Plans and Inventories

Hazardous Material Incidence Contingency Plan. The Lake County Environmental Health Department prepared their most recent Hazardous Material Incidence Contingency Plan in September 2000. The Plan, which is required by State law (Chapter 4962, Sec. 25500 of the California Health and Safety Code), provides a discussion of the overall coordination efforts necessary between local, state, and federal agencies within the County in the event of a hazardous material incident.

Local Regulations – Aviation Safety

The Lake County Airport Land Use Commission (ALUC) functions primarily in a review capacity for airport-related issues in the County. Proposals for the adoption or amendment of general and specific plans, zoning ordinances, building regulations, and airport master plans are to be referred to the ALUC prior to final action being taken by the appropriate governing body, such as the County Board of Supervisors.

The ALUC is responsible for the preparation of the Airport Land Use Plan and the recommendations and requirements that it provides for the County regarding aviation safety. The Airport Land Use Plan is discussed in greater detail later in this section.

ENVIRONMENTAL SETTING – HAZARDOUS MATERIALS/WASTE

Numerous human-made substances can be hazardous to health. Hazardous wastes generated by County residents and businesses contribute to environmental and human health hazards that have become an increasing public concern in recent years.

CUPA Facilities

The Lake County Environmental Health Department is a Certified Unified Program Agency (CUPA). The purpose of the CUPA program, as created by State law is to provide consolidation and consistency for reporting requirements, permit format, inspection criteria, enforcement standards, and fees for various hazardous materials programs. Since the Environmental Health Department is a CUPA agency, it is required by State law to maintain a list of CUPA facilities within the County that are known to use, store, and or generate hazardous materials/wastes. Appendix A contains the list of facilities that has been compiled by the Department. As revealed by this list, these facilities consist of a wide variety of uses ranging from automotive repair facilities to PG&E substations. The majority of these facilities tend to be concentrated in the more urbanized areas of the County, such as Kelseyville and Lakeport.

Landfill and Disposal Site Locations

The California Integrated Waste Management Board (CIWMB) is responsible for protecting the public's health and safety and the environment through management of the estimated 60 million tons of solid waste generated in California. The CIWMB works in partnership with local government, industry, and the public to reduce waste disposal and ensure environmentally safe landfills. The CIWMB maintains a Solid Waste Information System (SWIS) Database that contains information on solid waste facilities, operations, and disposal sites throughout the State of California. The types of facilities found in this database include landfills, transfer stations, material recovery facilities,

composting sites, transformation facilities, waste tire sites, and closed disposal sites. Table 7-3 presents the facilities listed by the CIWMB that are in Lake County. In addition to these existing facilities, the CIWMB identified the South Lake Materials Recovery Facility (MRF) and a facility in the planning stages.

Table 7-3 Landfills and Disposal Sites in Lake County

Name	Location	Activity
Eastlake Sanitary Landfill	16015 Davis Street, Clearlake	Solid Waste Disposal
Lakeport Transfer Station	910 Bevins Court, Lakeport	Solid Waste Transfer
Lakeport Disposal Recycling, Inc.	NA	Minor Waste Tire Facility
Last Mile Auto Dismantlers	1205 West Highway 20, Upper Lake	Auto Dismantler
Kelseyville Auto Salvage	7666 Highway 29, Kelseyville	Waste Tire Location
Source: California Integrated Waste Management Board, 2002		

Household Hazardous Waste

Household hazardous wastes typically include paints, solvents, pesticides, used motor oil, and car batteries, among other items. The Lake County Public Services Department sponsors the HazMobile program, which offers mobile pickup of household hazardous wastes on a regular basis.

ENVIRONMENTAL SETTING – AIRPORT SAFETY

Lampson Field Airport

Lampson Field Airport is a General Aviation Airport located in the western part of Lake County, approximately 3 miles south of Lakeport. The airport contains a single runway that is 3,600 feet in length. A full-length parallel taxiway is just south of the runway. According to the Federal Aviation Administration (FAA), a total of 117 airplanes are based at the airport, including 100 single-engine planes, 10 multi-engine planes, 4 helicopters and 3 ultralights. An average of 209 flights occur each day at the airport. The airport has no navigational aids, or currently published instrument approach procedures. As a result, aviation use is limited to visual flight rule operations, and generally does not operate during inclement weather.

Pearce Field Airport

Pearce Airport is owned and operated by Lake County, and is located near the southeastern rim of Clear Lake in the City of Clearlake. The airport

occupies approximately 44 acres of land and consists of a single runway that is 2,548 feet in length. In addition to its standard airport facilities, the airport contains a fire station. Like Lampson Field Airport, aviation use at Pearce Airport is limited due to the lack of navigational aids, or currently published instrument approach procedures.

Airport Land Use Plan

The Lake County Airport Land Use Commission (ALUC) prepared the Airport Land Use Plan in 1988. The Plan discusses the existing facilities (Lampson Field Airport and Pearce Field Airport), including the existing and projected usage, and necessary improvements for their expansion. In addition, there is a policy section of the plan that provides criteria to use in evaluating general and specific plans, zoning ordinances, building regulations or amendments to the Airport Land Use Plan for airports in the County. The Plan also discusses the development restrictions for airport safety zones to minimize the number of people subjected to potential aircraft accidents.

7.5 Flooding

METHODS

Information presented in this section is based on the Lake County Floodplain Management Plan and the Lake County Resource Management and Conservation Plan.

KEY TERMS

100-Year Floodplain. The 100-year floodplain is the land bordering a waterway that has a statistical chance of flooding once every 100 years.

Floodplain. Any area susceptible to inundation by floodwater from any source.

Flood Insurance Rate Map (FIRM). The official map on which the Federal Emergency Management Agency has delineated both the areas of special flood hazards and the risk premium zones applicable to the community.

REGULATIONS THAT AFFECT FLOODING

Federal Emergency Management Agency

The Federal Emergency Management Agency (FEMA) administers the National Flood Insurance Program (NFIP). The NFIP provides available flood insurance to those communities that have enacted local ordinances restricting development within a 100-year floodplain. FEMA requires that these

ordinances meet or exceed FEMA's regulations. As part of its program, FEMA prepares a Flood Insurance Rate Map (FIRM) that delineates the flood hazard areas in an area and identifies the location of areas within the 100-year floodplain. These maps form the basis for regulating floodplain development and the rating of insurance policies.

Lake County became a NFIP community member in 1978. In 1995, Lake County began participating in the Community Rating System (CRS), and was classified as a Repetitive Loss community. Since the County experienced a total of four major flood events in 1995, 1996, 1997 and 1998, the County decided to prepare a Floodplain Management Plan in 2000 as part of its CRS recertification efforts. This Plan is discussed in detail in the following paragraphs.

Lake County Floodplain Management Plan

The Lake County Floodplain Management Plan contains a flood hazard and problem assessment for water bodies located throughout the County. The assessment includes a qualitative ranking for each of the areas based on the following criteria:

- **Health & Safety/Access.** Due to the depth or speed of floodwaters, there is direct risk to life and limb, or property access is restricted not allowing access to personnel and/or emergency services.
- **Structures at Risk.** The relative numbers of residential and/or commercial properties that are at risk of flood damage.
- **Agricultural Land at Risk.** The relative acreage of developed agricultural lands that are at risk of flooding, and the potential for flood damage to those lands.
- **Infrastructure at Risk.** The relative risk to infrastructure, including roads and bridges, electrical service, public water supply systems, and public wastewater systems.
- **Risk to Environment.** The relative risk to the environment, such as risk of contamination by wastewater, agricultural wastes and/or chemicals. We note that some flooding is beneficial to the environment by facilitating the removal of sediment from floodwater.

Using the above criteria, flood prone areas were ranked. Health and safety risks to the environment were given higher weight when ranking waterbodies. The codes used to describe potential flood risk are the following:

- N No risk by flooding
- L There is a low risk, due to either number/area impacted or depth of flooding.

- M There is a moderate risk, due to either number/area impacted or depth of flooding.
- H There is a high risk, due to either number/area impacted or depth of flooding.

The Floodplain Management Plan makes the following recommendations to reduce flood damages:

- Continue to implement existing activities that are consistent with good floodplain management.
- Investigate additional development standards for the Clear Lake floodplain to reduce flood damage due to long periods of inundation and wave damage.
- Recognize the possibility that all or part of Lake County may come under the NPDES Phase II stormwater regulations and prepare to implement the Phase II standards at such time as may be required. Early implementation of outreach and best management practices (BMP) programs should be encouraged with the local CRMP and stewardship groups.
- The County should continue to pursue the Middle Creek Ecosystem Restoration Project to reduce flood risk in the Upper Lake Reclamation Area.
- The County should review the existing Wetland Policy for adequacy and consistency with other regulations and policies.
- The County should evaluate the development of a list of County appropriate BMP's.
- The County should continue to increase culvert and bridge capacities to reduce localized flooding.
- The County should continue working with the Hidden Valley Lake Association and the Hidden Valley Community Services District to upgrade the Hidden Valley Levee system to Federal standards.
- The County should continue to pursue reevaluation of flood damage reduction alternatives for Clear Lake, including new structural alternatives.
- The County should implement the activities identified in the Public Information Program Strategy.

According the Lake County Water Resources Division, these are all ongoing actions that the County is currently undertaking (December 2002).

ENVIRONMENTAL SETTING

Overview

Lake County contains an abundance of streams and lakes. As a result, during heavy periods of rainfall, streams such as Scott's Creek and Putah Creek, and lakes such as Clear Lake and Blue Lake, can cause flooding of surrounding areas. The County experiences flooding as a result of heavy rainfall that occurs over the lakes and tributary areas during winter months (November through March). In the more mountainous terrain of the County, flooding by creeks and small lakes occurs rapidly in response to individual storms. However, during more prolonged storm events, extended periods of flooding can occur in these areas as well as flatter more urbanized areas that have poor drainage. Flooding is most severe when rainfall has saturated the ground or when the ground is frozen in higher elevations and there is limited infiltration.

Cloudburst storms, sometimes lasting as long as three hours, can occur any time from the late fall to early spring, and may occur as an extremely severe sequence within a general winter rainstorm. These are high intensity storms that can produce peak flows equal or somewhat greater than those of general rainstorms in parts of the County. High peak flow, short duration of flood flow, and a small volume of runoff characterize flooding from cloudburst. In general, cloudburst storms impact small areas.

The flood potential for the various lakes and tributaries in the County tend to vary widely. Due to its size, Clear Lake does not respond quickly to storm events and only rises to flood stage when there are storms for prolonged periods. Flood problems along Cache Creek just downstream of Clear Lake are mainly confined to its main stem near Lower Lake and portions of the North Fork of Cache Creek. The main flood prone areas in the Putah Creek basin are in Middletown and in Coyote and Collayomi Valleys.

According to the 2000 Lake County Floodplain Management Plan, major floods in Lake County tend to inundate developed agricultural lands and urban-suburban residential and commercial lands, and create high lake stages that result in flooded lakeshores. Flooding can result in the damage and destruction of orchards, vineyards, grazing land, livestock, residential and commercial structures, roadways, and bridges. Along lakefronts, recreational areas, residential and commercial structures, piers, and boats can be damaged.

Flood Prone Areas

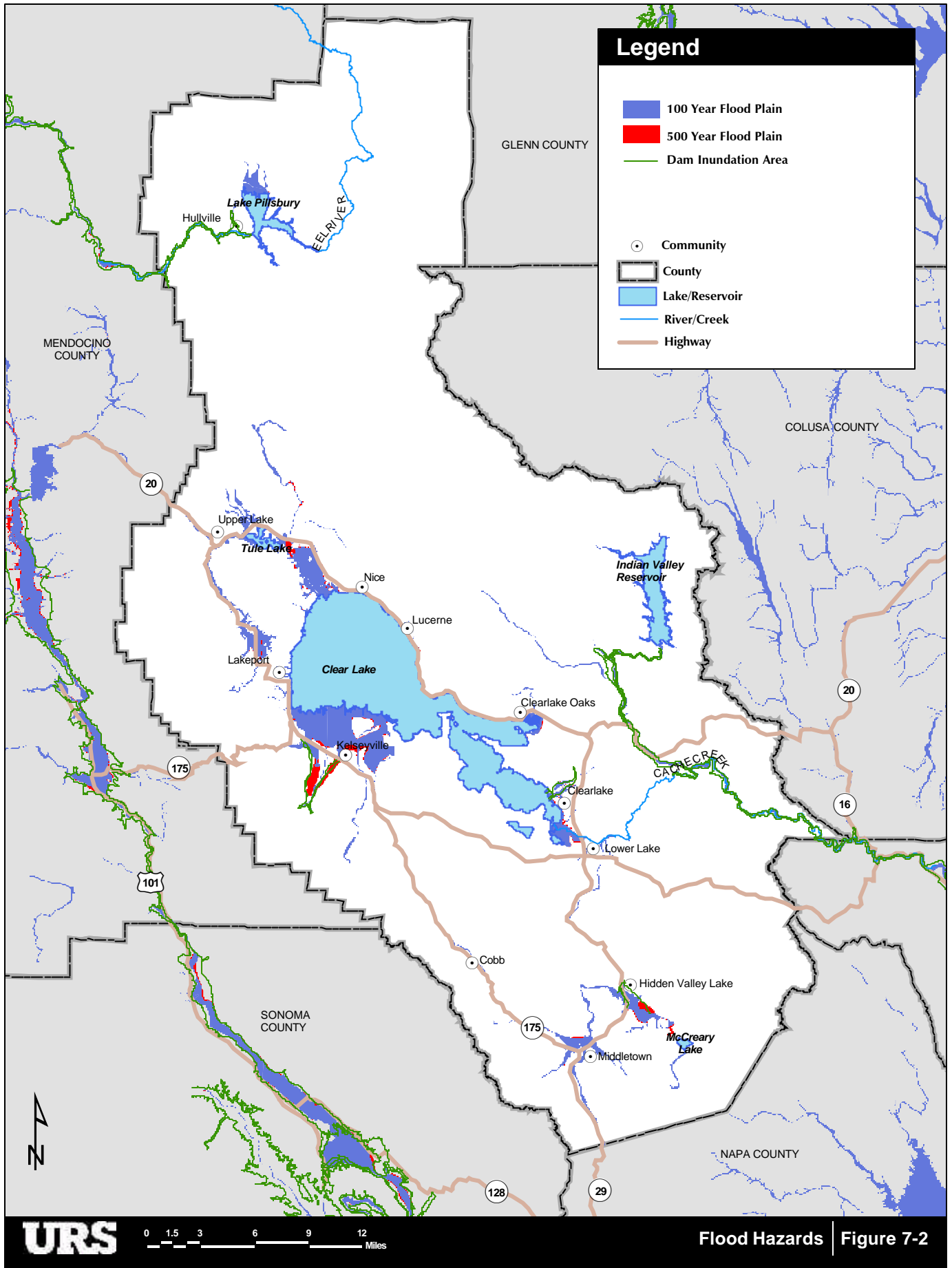
Figure 7-2 and Table 7-4 show the assessment that the plan prepared for the major lakes and tributaries in the County. As discussed in the table, the following are lakes and tributaries with moderate or high flood-risk rankings:

High Ranking

- Clear Lake
- Cole Creek

Moderate Ranking

- Scotts Creek
- Schindler Creek
- North Fork Cache Creek
- Herndon Creek
- Copsey Creek
- Kelsey Creek – Sweetwater Ranch
- Kelsey Creek – Kelseyville
- Adobe Creek
- Anderson Creek
- Dry Creek
- St. Helena Creek
- Putah Creek
- Coyote Creek
- Laura Dell Lake (Lower Blue Lake)



Flood Hazards | Figure 7-2

Source: FEMA Flood Insurance Rate Maps, 2003

Table 7-4 Flood Hazard/Problem Assessment

WATERBODY	EXISTING CONDITIONS	HAZARD	PROBLEM	HEALTH & SAFETY	STRUCTURES	AG LAND	INFRA-STRUCTURE	ENVIRONMENT	OVERALL RANKING
High Ranking									
Clear Lake	Due to its size, Clear Lake responds slowly to storm events and rises to flood stage only after prolonged, high intensity storms. When this happens, Clear Lake's natural outlet, Cache Creek, is too small to allow floodwater to leave the lake as fast as it enters. The Clear Lake dam can release water much faster than Cache Creek can flow. It is the narrow, shallow Cache Creek channel that slows the release of water from Clear Lake during a flood. Clear Lake Dam is designed to release water at 21,000 cubic feet per second (cfs). However, Cache Creek can deliver less than 4,700 cfs when Clear Lake is at 2 feet above flood stage. The Creek's limited flow causes Clear Lake to rise rapidly during heavy, prolonged rainstorms and does not lower lake levels very fast after the rains have stopped.	Frequent flooding, usually of long duration. High winds can cause large waves during floods.	Many homes (>3,500) subject to flooding and/or loss of access for extended periods. Wave damage can be significant. Large inflows to sanitary sewer systems cause overflows and contamination. Repetitive Loss area.	H	H	L	M	H	H
Cole Creek	At Konocti Road, the channel size diminishes substantially as the topographic regime changes from an incised stream into a remnant alluvial fan. Channel depths reduce from over six feet to three to four feet, resulting in channel overflows at high flows. North of Kelseyville, the channel flows in a shallow channel through a broad floodplain. Channel capacities are estimated at 350 to 700 cfs. Because of the limited channel capacity, overflows occur nearly every year, with extensive sheetflow occurring during major flood events.	Overflows frequently north of Konocti Road Bridge.	Numerous structures along Sylar Lane and Blue Court are subject to shallow flooding for short periods. Green Acres area (Clark Drive) are subject to up to several feet of sheet flow flooding, with some areas subject to flooding of several days to weeks. Flows increase significantly near Soda Bay Road when Kelsey Creek overflow joins Kelsey Creek (35-year +/- event). Repetitive Loss area.	H	H	L	M	L	H

Table 7-4 Flood Hazard/Problem Assessment

WATERBODY	EXISTING CONDITIONS	HAZARD	PROBLEM	HEALTH & SAFETY	STRUCTURES	AG LAND	INFRA-STRUCTURE	ENVIRONMENT	OVERALL RANKING
Moderate Ranking									
Adobe Creek	Peak flows for Adobe Creek in 1995 exceeded the 100-year flood event. Flooded areas include the community of Finley (residential and commercial development with 30 to 40 mostly pre-FIRM structures), several hundred acres of developed agricultural land (vineyards, pear and walnut orchards and pasture. Several public roads are also flooded, including Thomas Drive, Finley East Road and Soda Bay Road. Soda Bay Road has shoulder damage due to flooding in 1995 and 1997. Flooding is shallow (generally less than one foot depth) with low velocities and short duration, therefore, damage is limited. Flooded septic tanks or agricultural wastes may contaminate floodwaters.	High flows leave channel north of HWY 29 and south of Bell Hill Road. Approximate flood zone south of Bell Hill Road.	Flooding of agricultural land, town of Finley and damage to several County roads.	M	H	M	L	L	M
Anderson Creek	Much of the watershed is heavily forested mountain slopes and receives some of the highest rainfall amounts in Lake County. As a result, flows rise and fall quickly and contain significant quantities of natural debris. Many of the structures are pre-FIRM and constructed close to the creek. Because of the steep valley sides, many of the structure's livable areas are located above the base flood elevation. There are several bridges across Anderson Creek that are susceptible to blockage by debris. This has resulted in damage to the bridges, block access and collateral damage to structures.	Infrequent flooding. Blockages of bridges by logs and debris cause flooding.	Relatively densely developed along creek. Mostly older pre-FIRM homes.	M	M	N	M	M	M
Copsey Creek	Flood flows are contained within the creek	Overflows during	Numerous structures built when	M	M	N	L	L	M

Table 7-4 Flood Hazard/Problem Assessment

WATERBODY	EXISTING CONDITIONS	HAZARD	PROBLEM	HEALTH & SAFETY	STRUCTURES	AG LAND	INFRA-STRUCTURE	ENVIRONMENT	OVERALL RANKING
	channel until it passes under Morgan Valley Road. Flows have overtopped the Copsey Creek Way Bridge off Quarterhorse Lane at least twice, although the FIRM indicates the base flood elevation is below the bridge. Since the creek overtops its banks at elevations over ten feet above the level of Cache Creek, the operation of Clear Lake Dam is not likely the primary cause of flooding, except in areas near the confluence of the two creeks. Approximately ten homes along the creek are subject to flooding during high flows. Some of the homes are impacted by floodwaters from both Copsey and Herndon Creek, increasing their risk. Flooding of this nature occurred in 1986, and twice in 1995 and in 1997.	infrequent events (>10-year). Have experienced two floods with elevations greater than the mapped 100-year elevation.	approximately mapped (until 3/2/98) are subject to sheet flows and damage. Repetitive Loss area.						
Coyote Creek	Coyote Creek has shallow flooding through the Hidden Valley Lake Subdivision below Hidden Valley Lake until it joins Gallagher Creek, where it is contained by its channel and levees until it joins Putah Creek. The majority of the floodplain is developed as a golf course, with lightly developed agricultural land on the south creek bank. Therefore, a majority of the floodplain has limited flood risk. Several lots at the ends of Deer Hollow Road and Fishhook Court are subject to frequent (10-year event) shallow flooding. Velocities are high, with loss of topsoil a problem on Fishhook Court. The structures are constructed to post-FIRM standards, therefore, structure damage is limited.	Frequent shallow flooding.	Floods golf course, several homes on Fishhook Court and Clubhouse at Hartmann Road.	M	L	L	M	L	M

Table 7-4 Flood Hazard/Problem Assessment

WATERBODY	EXISTING CONDITIONS	HAZARD	PROBLEM	HEALTH & SAFETY	STRUCTURES	AG LAND	INFRA-STRUCTURE	ENVIRONMENT	OVERALL RANKING
<p>Dry Creek</p>	<p>The watershed is very steep, with the highest recorded rainfall amounts for Lake County in the upper watershed. Flows rise and fall quickly and cause considerable flooding in the Middletown area. The cause of the flooding is inadequate channel and bridge capacities. Flood flows will leave the banks north of the Dry Creek Cutoff, flooding rural residential and vineyard lands. High flows also flow across Highway 175 and through the Callayomi Park Subdivision. Approximately 10 to 15 homes are subject to shallow flooding during these events. Flow depths are generally less than one foot and velocities are low, therefore, damage is limited. Flooded septic tanks or agricultural wastes may contaminate floodwaters.</p>	<p>Frequent flooding. Large areas of sheet flow near HWY 175.</p>	<p>Flooded areas are agricultural and low density rural residential.</p>	<p>M</p>	<p>M</p>	<p>L</p>	<p>L</p>	<p>L</p>	<p>M</p>
<p>Herndon Creek</p>	<p>Flood flows are contained within the creek channel until approximately one half mile upstream of the Bonham Road culvert. Channel capacity is exceeded by the 10-year flood event. A major overflow occurs approximately one-quarter mile upstream of the culvert, which causes sheet flow across Bonham Road into the Copsey Creek Ranch subdivision. Sheet flows have damaged homes built on Mustang Court (pre-FIRM Zone C structures that are now in Zone B) and homes on Quarterhorse Lane. Flow velocities can be high at Quarterhorse Lane, as flow drops from a high terrace to a low terrace at Quarterhorse Lane. The creek also floods downstream of Bonham Road, endangering less</p>	<p>Overflows during infrequent events (>10-year) with large areas of shallow sheet flow. Has caused repetitive losses.</p>	<p>Numerous structures built when approximately mapped (until 3/2/98) are subject to sheet flows and damage. Repetitive Loss area.</p>	<p>M</p>	<p>M</p>	<p>N</p>	<p>L</p>	<p>L</p>	<p>M</p>

Table 7-4 Flood Hazard/Problem Assessment

WATERBODY	EXISTING CONDITIONS	HAZARD	PROBLEM	HEALTH & SAFETY	STRUCTURES	AG LAND	INFRA-STRUCTURE	ENVIRONMENT	OVERALL RANKING
	<p>than ten houses on Bonham Road and the end of Mustang Court. Flooding of this nature occurred in 1986, twice in 1995 and in 1997. Inadequate channel capacity, although property owners in the area believe flooding is aggravated by the operation of Clear Lake Dam. Since the creek overtops its banks at elevations over twenty feet above the level of Cache Creek, the operation of Clear Lake Dam is not likely to be the primary cause of flooding. At risk are approximately 20 to 25 homes, a majority of which were constructed prior to the current FIRM revision (March 2, 1998).</p>								
<p>Kelsey Creek - Kelseyville</p>	<p>Kelsey Creek is generally contained within its banks between the Sweetwater Ranch area to approximately one mile north of Kelseyville, where it overflows both the east and west banks generating sheetflow into adjacent drainages. Overflows occur during greater than 15-year flood events. Estimated flood flows in the Flood Insurance Study are considerably higher than flood frequency analysis indicates. With the number of years of record (51), the flood frequency is probably correct; therefore, the precise risk is unknown. Gravel mining and channelization of the creek delta at Clear Lake have destabilized the channel and caused substantial downcutting (over ten feet in some locations) throughout this reach of creek. Bank failure and erosion are common in the impacted</p>	<p>High flows contained within channel from Gross Crossing to corner on Finley East Road. Channel overflows both east and west banks below this point in major flows (>35-yr event).</p>	<p>Overflows cause sheet flow flooding 10-20 structures and adding to Cole Creek flows at Soda Bay Road (contributes to Repetitive Loss). Channel aggradation could increase chances of upstream flooding in 20+/- years. Several significant archeological sites along the creek are subject to erosion at high flows.</p>	<p>M</p>	<p>M</p>	<p>M</p>	<p>L</p>	<p>M</p>	<p>M</p>

Table 7-4 Flood Hazard/Problem Assessment

WATERBODY	EXISTING CONDITIONS	HAZARD	PROBLEM	HEALTH & SAFETY	STRUCTURES	AG LAND	INFRA-STRUCTURE	ENVIRONMENT	OVERALL RANKING
	<p>area. The overflow areas place approximately 30 residential, commercial and agricultural structures at risk. Most of these structures are pre-FIRM, therefore, are susceptible to flood damage. Several hundred acres of vineyards and pears are subject to the periodic flooding, however, since the depths are shallow, velocities low and the period short, damage is limited. Flooded septic tanks or agricultural wastes may contaminate floodwaters.</p>								
<p>Kelsey Creek - Sweetwater Ranch</p>	<p>Kelsey Creek is near its "natural" geomorphic configuration, and frequently floods outside its normal flow channel. The area was subject to intensive gravel mining until 1987 and is readjusting to a natural condition. Ten to fifteen homes are subject to flooding. Several properties on the east side of the creek have vehicular access cutoff during high flows. The two highest flows of record (1946 until present) occurred in March 1995 and January 1997. Both events are considered approximately 20-year flood events based on frequency analysis of all available data. Several pastures, corrals and barns are at risk of flooding. Floodwaters may be contaminated by flooded septic tanks and animal waste from corrals.</p>	<p>Overflows frequently, with significant flooding during major flows (30+ year events. Approximate flood zone.</p>	<p>Flooding of over 3 feet has been reported at some homesites. Erosion threatens Kelsey Creek Drive. Access is problem for properties on east side of creek. Repetitive Loss area. Have requested development of detailed mapping in the area.</p>	<p>M</p>	<p>M</p>	<p>N</p>	<p>M</p>	<p>L</p>	<p>M</p>
<p>Laurel Dell Lake (Lower Blue Lake)</p>	<p>Inflows to the lake cause rises in water level. However, high water levels in Scotts Creek cause the controlling flood elevations. There are six repetitive loss properties around Laurel Dell Lake. Reviews of the repetitive loss records indicate some structures are subject to flooding during 3-</p>	<p>Frequent flooding caused by Scotts Creek backup.</p>	<p>Four to five homes have suffered repetitive losses.</p>	<p>M</p>	<p>M</p>	<p>N</p>	<p>N</p>	<p>L</p>	<p>M</p>

Table 7-4 Flood Hazard/Problem Assessment

WATERBODY	EXISTING CONDITIONS	HAZARD	PROBLEM	HEALTH & SAFETY	STRUCTURES	AG LAND	INFRA-STRUCTURE	ENVIRONMENT	OVERALL RANKING
	<p>year flood events (approximately 5,000 cfs). The cause of the flooding is Scotts Creek's limited channel capacity (approximately 1,000 cfs) between Tule Lake and Laurel Dell Lake. Flooding can last for several days to weeks. In addition to the 30 to 40 at-risk structures around Laurel Dell Lake, flooding limits access to Scotts Valley Road and to properties across the creek. Floodwaters may become contaminated by flooded septic tanks.</p>								
<p>North Fork Cache Creek</p>	<p>The floodplain extends from the downstream face of Indian Valley Reservoir (IVR), to the confluence with Cache Creek. Flow is highly regulated by IVR, which was constructed for flood control and water supply purposes. Much of this floodplain is undeveloped, with the Spring Valley Lake Water Treatment Plant and several rural residential structures located north of the confluence with Long Valley Creek being the two areas of concern. The entire floodplain is mapped by approximate methods, therefore, the exact risk is unknown.</p>	<p>Some shallow flooding and erosion. Partially regulated by Indian Valley Reservoir. Approximate flood zone.</p>	<p>Most of flooded area is undeveloped. Water Treatment Plant at Spring Valley Lake is vulnerable, especially to erosion. Several lots on Pomo Trail may be at risk. The areas geology is prone to landslides. A large landslide into the creek could block water flow causing flooding.</p>	<p>M</p>	<p>L</p>	<p>N</p>	<p>M</p>	<p>M</p>	<p>M</p>
<p>Putah Creek</p>	<p>Much of the upper watershed is heavily forested mountain slopes and receives some of the highest rainfall amounts in Lake County. In spite of the size of the drainage, flows rise and fall quickly, however, extended periods of heavy rain can keep the creek above flood stage for several days. The cause of the flooding is inadequate channel and bridge capacities.</p>	<p>Infrequent flooding. Most flows contained within channel. Approximate flood zone near Anderson Springs.</p>	<p>Most flooded land is agricultural or undeveloped. Overflows at HWY 175 threaten roadway. High creek levels at Hidden Valley Lake Subdivision limit outflow through levee, causing interior flooding. Repetitive Loss area.</p>	<p>M</p>	<p>H</p>	<p>M</p>	<p>M</p>	<p>M</p>	<p>M</p>

Table 7-4 Flood Hazard/Problem Assessment

WATERBODY	EXISTING CONDITIONS	HAZARD	PROBLEM	HEALTH & SAFETY	STRUCTURES	AG LAND	INFRA-STRUCTURE	ENVIRONMENT	OVERALL RANKING
Schindler Creek	Schindler Creek drains the High Valley area through the community of Clearlake Oaks. The FIRM shows limited flooding potential in High Valley, and with the limited development in the area, flooding problems would be limited. The community of Clearlake Oaks was developed on the delta of Schindler Creek. Significant fill was placed in the delta to raise the developed area above the more frequent flood elevations, however, due to settlement and insufficient fill, numerous homes are within the floodplain of Clear Lake. Schindler Creek runs through the area and discharges into dredged canals, leading to sedimentation of the canal and the lower reaches of the creek channel. Channel erosion endangering structures adjacent to the creek is also a concern.	Potential flooding along creek south of HWY 20. Also subject to severe bank erosion. FIS being redone to determine magnitude of hazard, currently an approximate flood zone.	Erosion is endangering several structures. Deposition at mouth is reducing channel/bridge capacity and creating navigation problem.	M	M	N	L	L	M
Scotts Creek	Scotts Creek's flood flows exceed its channel capacity for nearly the entire stream below the Scotts Valley Road Bridge. Some areas flood frequently, while others receive partial protection behind levees.	Extensive flooding occurs from the confluence with Middle Creek to the Scotts Valley Road Bridge (20 mi. +/-). Land is primarily agricultural. Levees in Scotts Valley are not adequate and are prone to failure. Flooding can extend for periods of several days.	Levee at HWY 29 is of insufficient height to provide 100-year flood protection. Overtopping in 1995 resulted in flood depths of up to 8 feet. Interior drainage is unable to flow into Scotts Creek during severe events, also causing flooding of up to 5 feet. Severe flooding of several homes in the Blue Lakes area (a Repetitive Loss area). Reduction of productivity of some agricultural land, severely restricted access to property across creek, and frequent flooding of public roads (Scotts Valley and Eickhoff Roads).	M	M	L	M	M	M

Table 7-4 Flood Hazard/Problem Assessment

WATERBODY	EXISTING CONDITIONS	HAZARD	PROBLEM	HEALTH & SAFETY	STRUCTURES	AG LAND	INFRA-STRUCTURE	ENVIRONMENT	OVERALL RANKING
<p>St. Helena Creek</p>	<p>The watershed is steep, much of which is forested. Flows rise and fall quickly, with shallow flooding from Bradford Road through Middletown to Putah Creek. The cause of the flooding is inadequate channel and bridge capacities. Flow velocities are high, presenting an erosion risk and a damage potential to structures subject to more than a foot of flooding. Damage to structures has not been substantial, however, bank erosion presents a problem in many areas of the creek and threatens several structures.. South of Middletown, development is primarily low density agricultural parcels, with the exception of the Mirabel Estate Subdivision. Approximately 60 lots are subject to shallow flooding. Structures west of the creek are generally in the floodplain and subject to frequent flooding (10-year event), with a majority of the structures on the east side of the creek are on high terrace and not subject to flooding. Flooded septic tanks or agricultural wastes may contaminate floodwaters.</p>	<p>Frequent flooding. Bank erosion problems in Middletown.</p>	<p>Shallow flooding of residential development south of Middletown.</p>	<p>M</p>	<p>H</p>	<p>L</p>	<p>M</p>	<p>L</p>	<p>M</p>

Source: Lake County Floodplain Management Plan, 2000

Legend:

- N - no risk
- L - low risk
- M - moderate risk
- H - high risk

7.6 Urban and Wildland Fires

METHODS

Information presented in this section is based on the Lake County Resource Management and Conservation Plan.

KEY TERMS

Fire Hazard Severity Zones (FHSZ). The FHSZ are zones that have been designated by the California Department of Forestry (CDF) to indicate the severity of fire hazard in a particular geographical area. Based on the level of severity, an area is designated moderate, high, or very high by the CDF.

State Responsibility Areas (SRA). The primary responsibility for protecting this area during the fire season is the CDF.

Wildfires. A wildfire is typically a raging fire that travels and spreads rapidly.

REGULATIONS THAT AFFECT FIRE HAZARDS

Public Resources Code (PRC 4201-4204)

PRC Sections 4201-4204 were enacted statewide in 1982 after fires in San Bernardino, Napa, and Los Angeles Counties destroyed over 500 structures between 1980 and 1982. These sections required that the CDF classify all SRA lands into fire hazard severity zones according to the severity of fire hazards determined to exist in various areas. The purpose of this requirement was to identify measures to retard the rate of wildfire spread, and to reduce the potential intensity of wildfires that could destroy resources, life, and property. As required by State law, the zones must embrace relatively homogenous lands, and the fire hazard severity rating must be based on fuel loading, slope, fire weather, and other relevant factors.

State of California Fire Hazard Mitigation Plan

The State Office of Emergency Services has prepared the State of California Fire Hazard Mitigation Plan that offers background information on the State's fire hazards as well as recommendations for reducing risk.

California Fire Plan

The State Board of Forestry's California Fire Plan describes the environment at risk within the state and the necessary measures to reduce those risks. It has also adopted fire safe regulations for counties, such as Lake County, that have State Responsibility Areas (Title 14, 1270, et seq., California Code of Regulations) in an effort to reduce pre-fire fuel loads. The plan includes fire

regulations on road standards, signage standards, minimum water supply reserves, and fuel breaks.

With certain exceptions, all new construction and subdivisions within the State Responsibility Areas (SRAs) must meet the Title 14 standards or equivalent local requirements that have been certified by the State Board of Forestry.

Lake County Resource Management and Conservation Plan

The Lake County Resource Management and Conservation Plan provides various objectives, policies, and implementation measures to reduce the risk of life and property as a result of structural or wildland fires.

ENVIRONMENTAL SETTING

As indicated previously in this section, the California Department of Forestry (CDF) has three designations for fire hazard severity zones; moderate, high, and very high. As shown in Figure 7-3, most of the southern half of Lake County, including areas surrounding Clear Lake, are located in the very high fire hazards severity zone. The remainder of the County is designated as high or moderate.

The County's rugged topography, dense vegetation cover, and hot, dry summers are major contributors to creating the very high severity zones. Wildfires hazards are especially dangerous in Lake County due to the presence of development in forest and shrub areas.

One of the resultant effects of wildfires is the removal of natural groundcover, which increases the risk of slope failure and erosion. In turn, this creates the potential for landslides during wet weather conditions.

Determining Factors of Fire Hazards

The following is a discussion of the determining factors of urban and wildland fire hazards as indicated by the Lake County Resource Management and Conservation Plan.

Vegetation. The amount of existing wildland vegetation that may serve as potential fuel for a fire is called fuel loading. The extent and severity of fuel loading is dependent upon the type and amount of vegetation that exists in a particular area. Flammable grasses and annual herbs are considered light fuels. Brush and shrubs that are less than six feet in height are considered to be medium fuels, heavier brush and timber over six feet are considered to be heavy fuels.

Map to be provided when data becomes available

1

Climate. Severe fire weather conditions occur in the County when temperature rises to over 100 degrees Fahrenheit, relative humidity drops to near zero and hot, dry north or east winds blow at high velocities. Lake County has an average of more than 9.5 days of critical fire weather conditions per year.

Slope. An additional hazard is when residential development is located on steep slopes or brush covered hillsides. Development in steep terrain often results in the construction of narrow, twisting roads that do not provide adequate access for fire equipment. This is typical of residential development in the Cobb Mountain area of Lake County. Furthermore, for every 20 percent increase in slope, a fire spreads at double the rate.

Population. Population that is present in areas sensitive to brush fires constitute the fourth factor contributing to the incidence of wildfire. As Lake County's population continues to increase, higher levels of human activity result in increases in the frequency of domestic fires and wildfires. As a result, the number of residential and commercial structures requiring protection increases and therefore places an additional demand on fire protection services.

FIRE PROTECTION SERVICES

The County is divided up into State Responsibility Areas (SRAs) and Local Responsibility Areas (LRAs). During fire season California Department of Forestry (CDF) is responsible for the SRAs and the local fire districts are responsible for the LRAs. The California Department of Forestry (CDF), which provides fire protection services within the SRA in the County, has developed a fire hazard severity scale that uses the vegetation, climate, and slope factors in evaluating wildfire hazard. In addition to CDF fire protection services for the County, there is a total of eleven local fire protection districts which provide fire protection services throughout the County.



Fire protection services are discussed in greater detail in Section 5.8, "Public Facilities and Services."

7.7 Emergency Response

METHODS

Information presented in this section is based on consultation with the Lake County Sheriffs Department.

KEY TERMS

There are no key terms for this section.

REGULATIONS THAT AFFECT EMERGENCY SERVICES

State Office of Emergency Services

The State Office of Emergency Services administers the Standardized Emergency Management System (SEMS) that provides a basis for coordinating multi-agency emergency responses. SEMS incorporates mutual aid agreements, establishes lines of communication during emergency situations, and provides standardization for incident command. Local agencies, such as Lake County, are not required to participate in SEMS. However, if they do not participate in SEMS, they will not be eligible for reimbursement of response costs under disaster assistance programs.

ENVIRONMENTAL SETTING

Emergency Operations Plan

The most recent Emergency Operations Plan was adopted by Lake County in 1996. The plan's primary goal is to help save lives and minimize damage to property due to a major disaster through prior planning and emergency preparedness training. The Plan serves as an extension of both County and State emergency plans, and it assigns tasks, provides guidance, specific policies and general procedures for the integration and coordination of the planning efforts or various emergency staff and service elements.

According to the County Sheriff Department's Office of Emergency Services, an update of the Emergency Operations Plan is currently (December 2002) underway and is scheduled for completion in early 2003. In addition to the key issues that are currently addressed (i.e., earthquakes, fire, and flooding), the new plan will address bioterrorism.

Please see the next page.