JUNE LAKE
MASTER ENVIRONMENTAL ASSESSMENT
(MEA)

Revised 2002

June Lake
Master Environmental Assessment (MEA)

Revised 2002

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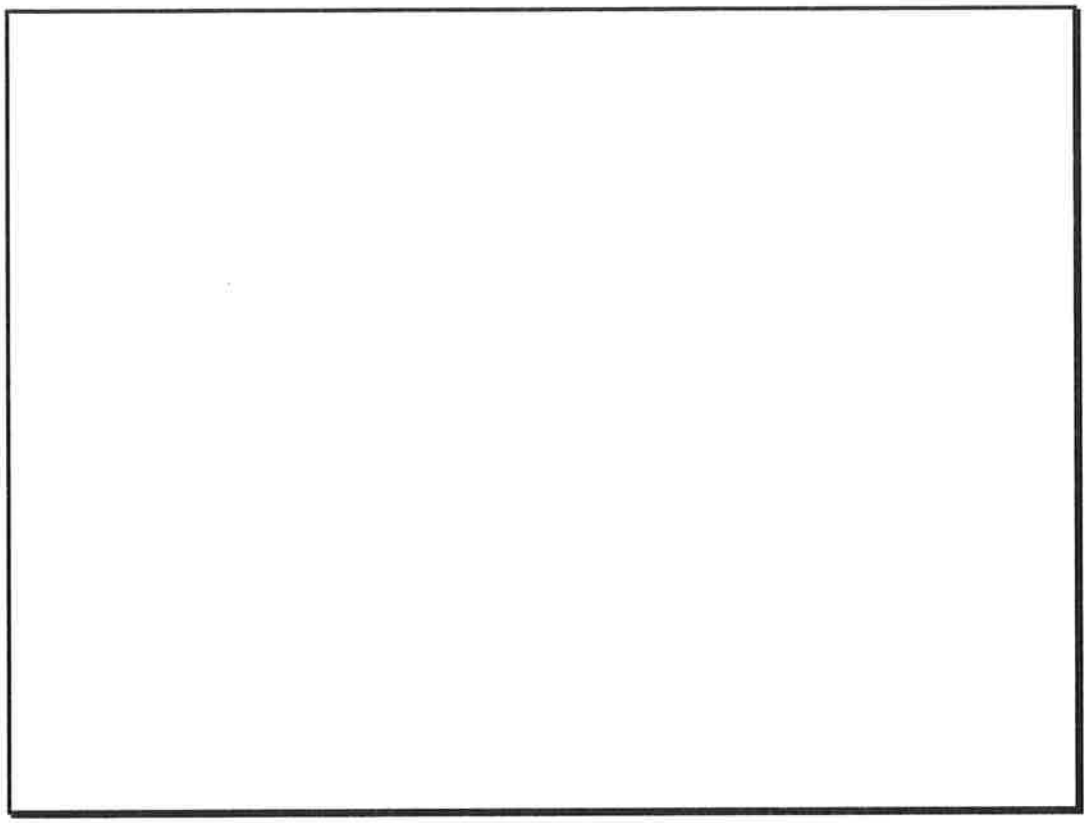


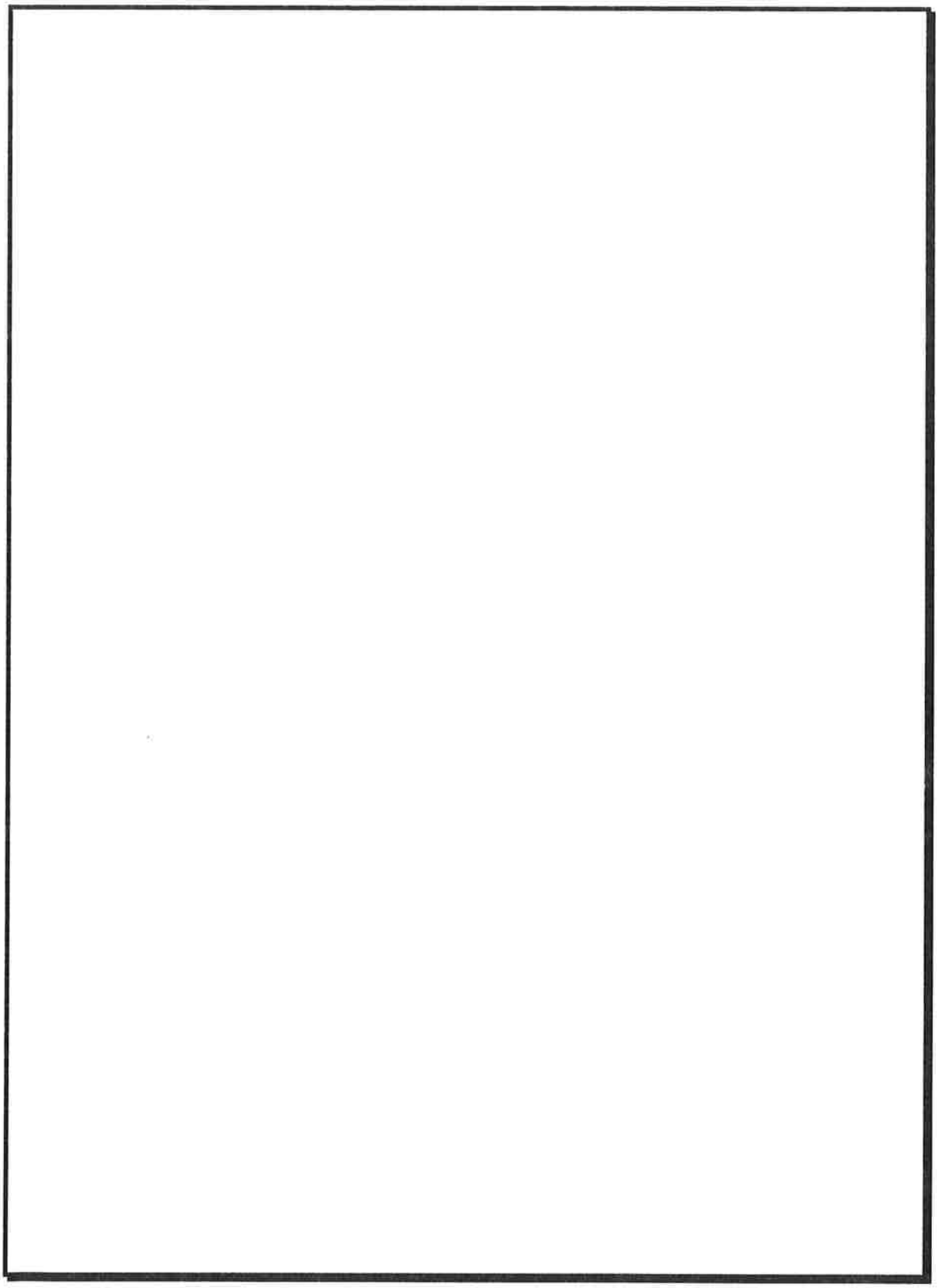
JUNE LAKE

June Lake is located on the eastern side of the Sierra Nevada in Mono County, approximately 300 miles northeast of Los Angeles, 145 miles south of Reno, Nevada, and 15 miles north of Mammoth Lakes (see Figure 1). The area's spectacular scenery of high valleys and rugged mountain ranges has made it a popular recreation destination. The community of June Lake has a resident population of approximately 613 persons (2000 US Census), nestled in a deep mountain canyon. The area's quaint small-town atmosphere and pristine natural setting area its primary attraction. Outdoor recreational activities form the economic foundation of the community.

JUNE LAKE MASTER ENVIRONMENTAL ASSESSMENT

The **June Lake Master Environmental Assessment (MEA)** was originally prepared as part of the June Lake Area Plan update process in 1991. The **MEA** contains all of the background information for the Area Plan and serves as a database for the development of Area Plan policies. The **MEA** fulfills General Plan Guideline requirements for information on existing conditions; it

FIGURE 1 JUNE LAKE VICINITY MAP



also fulfills CEQA requirements for the environmental setting section of an Environmental Impact Report (EIR).

The comprehensive database collected in the preparation of a MEA streamlines the process of preparing future environmental documents. The **June Lake MEA** contains information on the existing conditions in the County and analyzes the effects those conditions would have on future development. Future projects can benefit from this analysis as it will lessen the work necessary to prepare future environmental documents. MEAs also allow local agencies to update the database as new information becomes available.

LEGAL AUTHORITY FOR MASTER ENVIRONMENTAL ASSESSMENT

CEQA Guidelines (§ 15169) state that public agencies may prepare MEAs for all, or a portion of, the territory subject to their control in order to provide a comprehensive database that can be referenced in future EIRs or Negative Declarations. CEQA guidelines do not contain requirements for the format, content or procedures used in preparing MEAs; MEAs are suggested solely as an approach to identify and organize environmental and other applicable background information.

SUMMARY OF 2002 MEA UPDATE

The 2002 update of the **June Lake MEA** includes an extensive update of all the information presented in the MEA. Tables, figures, and maps have been revised to reflect up-to-date information. In some cases, tables or figures have been deleted where they are no longer applicable.

The document has also been reformatted to be easier to use. References to internet sites that provide additional information on topics in the document have been added throughout the text and in the references section.

CHAPTER 2
PLANNING BACKGROUND

A number of agencies have plans and policies that affect land use and development in the June Lake Loop on both private and public lands. This chapter provides a brief synopsis of those plans and policies. It also summarizes several collaborative approaches to planning and resource management in the Eastern Sierra.

LOCAL AGENCY PLANS AND POLICIES

MONO COUNTY GENERAL PLAN

California Government Code § 65300 requires each county to "adopt a comprehensive long-term general plan for the physical development of the county."

The Mono County General Plan acts as a foundation for all land use decisions; it expresses development goals for the county as a whole and for individual communities and embodies public policy on the distribution of future land uses. The General Plan addresses a broad and evolving range of issues associated with development, including physical, social and economic concerns, in seven mandatory elements: Land Use, Circulation, Housing, Noise, Safety, Conservation and Open Space.

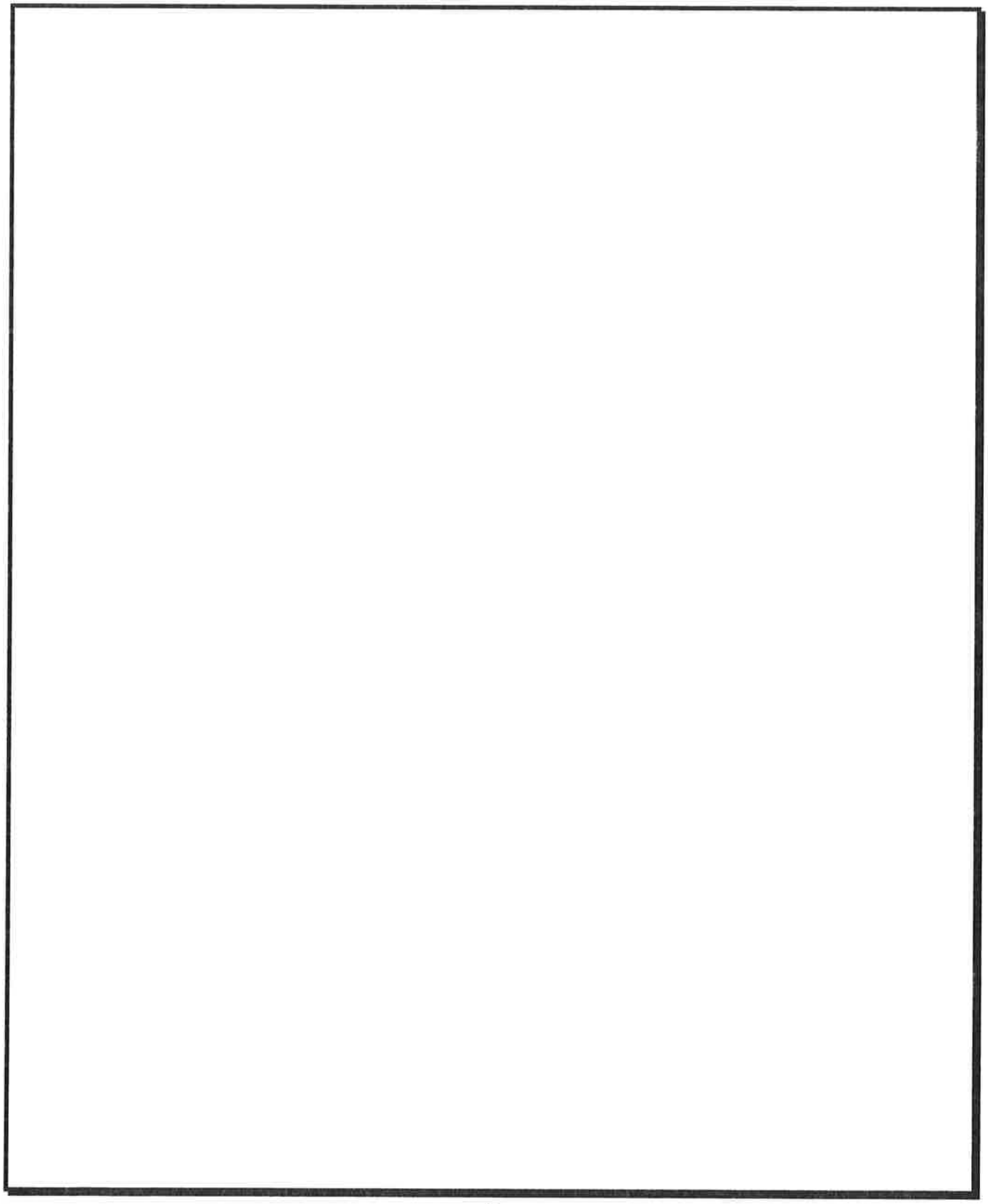
The Mono County General Plan also contains a Hazardous Waste Management Element, prepared in accordance with the State Department of Health Services (DHS) Guidelines for the Preparation of Hazardous Waste Management Plans. The objective of the planning process is "to insure that safe, effective, and economical facilities for the management of hazardous wastes are available when they are needed, and that these facilities are of a type, and operated in a manner, which protects the public health" (California DHS, 1987a). The current Mono County General Plan is a revision of previously adopted general plan elements; it supercedes and replaces those elements. Although the plan covers the entire County, detailed planning focuses on private lands and lands owned by the Los Angeles Department of Water and Power.

JUNE LAKE AREA PLAN

The June Lake Area Plan further refines county general plan policies to address the particular needs of the June Lake community and planning area. The Area Plan identifies issues which are important to the community and establishes goals, policies and programs to address those issues.

June Lake Area Plan policies were developed by the June Lake Community Advisory Committee (CAC). Figure 2 shows the boundaries of the community planning areas. In addition to the Area Plans, Specific Plans provide detailed direction for implementation of General Plan policies for specific areas throughout the June Lake planning area. Specific Plans have been adopted for several parcels in June Lake.

FIGURE 2 JUNE LAKE AREA PLAN BOUNDARIES



JUNE LAKE REDEVELOPMENT PLAN

A redevelopment feasibility study has been prepared for the June Lake community. The study is an outgrowth of policies contained in the June Lake Area Plan. The study finds that use of redevelopment powers for June Lake is feasible and the establishment of a redevelopment agency and preparation of a redevelopment plan could become a major implementing mechanism for achieving the goals of the June Lake Area Plan (Mono County, 1989).

MONO COUNTY LOCAL AGENCY FORMATION COMMISSION
(Sphere of Influence Reports, Government Reorganization Studies)

The Local Agency Formation Commission (LAFCO) is required to prepare a Sphere of Influence Report for each special district and city in the County. The Sphere of Influence study defines the ultimate service area and boundary of a local agency and recommends future governmental reorganizations. The purpose of these studies is to encourage the orderly formation of local agencies, to discourage sprawl, and to preserve valuable open space and agricultural lands. Mono LAFCO has adopted Spheres of Influence for the June Lake Public Utility District and the June Lake Fire Protection District.

REGIONAL TRANSPORTATION PLAN (RTP)

Section 65080 et. seq. of the California Government Code requires the preparation of Regional Transportation Plans (RTPs) and the update of those plans on a biennial basis. The purpose of a Regional Transportation Plan is to:

- Provide a clear vision of the regional transportation goals, policies, objectives and strategies;
- Provide an assessment of the current modes of transportation and the potential of new travel options within the region;
- Predict the future needs for travel and goods movement;
- Identify and document specific actions necessary to address the region's mobility and accessibility needs;
- Identify guidance and document public policy decisions by local, regional, state and federal officials regarding transportation expenditures and financing;
- Identify needed transportation improvements, in sufficient detail, to serve as a foundation for the:

    1) Development of the Federal Transportation Improvement Program (FTIP), the Regional Transportation Improvement Program (RTIP), and the Interregional Transportation Improvement Program (ITIP);

- Facilitation of the National Environmental Protection Act (NEPA)/404 integration process decisions;
- Identification of project purpose and needs;
- Development of an estimate of emissions impacts for demonstrating conformity with the air quality standards identified in the State Implementation Plan (SIP).
- Promote consistency between the California Transportation Plan, the regional transportation plan and other transportation plans developed by cities, counties, districts, private organizations, tribal governments, and state and federal agencies responding to statewide and interregional transportation issues and needs;

- Provide a forum for: 1) participation and cooperation, and 2) to facilitate partnerships that reconcile transportation issues which transcend regional boundaries and;
- Involve the public, federal, State and local agencies, as well as local elected officials, early in the transportation planning process so as to include them in discussions and decisions on the social, economic, air quality and environmental issues related to transportation.

State and federal planning laws require extensive coordination with applicable local, state and federal plans and programs during the development of the RTP. The Mono County RTP contains policies that affect planning and transportation improvements on state and local roads in June Lake.

MONO COUNTY SOLID WASTE MANAGEMENT PLAN

The Solid Waste Management and Resource Recovery Act of 1972 requires that each county prepare and implement a Solid Waste Management Plan (SWMP). The County's Land Use Element must reflect the policies of the SWMP, specifically future locations for solid waste disposal facilities. The County is in the process of updating its SWMP (Mono County, 2000).

LOS ANGELES DEPARTMENT OF WATER AND POWER (LADWP or DWP) [www.ladwp.com]

The LADWP owns land at the northern end of Grant Lake, within the June Lake planning area boundaries, most of which were acquired in the early 1900's in order to gain water rights and an inexpensive water supply for Los Angeles. This land continues to be managed by the LADWP in order to maintain water resource holdings. As a large landowner in Mono County, the Los Angeles Department of Water and Power (LADWP) is subject to all County, State, and Federal land use policies and regulations.

STATE AGENCY PLANS AND POLICIES

CALIFORNIA DEPARTMENT OF FISH AND GAME [www.dfg.ca.gov]

The California Department of Fish and Game (DFG) has the authority to regulate any alteration of "... the natural flow or ... the bed, channel or bank of any river, stream or lake designated by the department". Prior to development, developers must obtain a Streambed Alteration Permit from DFG. The Department analyzes these applications based on the impact of the requested alteration on fish and wildlife resources and may suggest mitigation measures, if necessary, to protect the resource.

The Department also administers the California Endangered Species Act, adopted by the California legislature to conserve, protect, restore, and enhance endangered or threatened ("special status") species. The Act prohibits the state or state agencies from approving projects that would jeopardize the continued existence of any endangered or threatened species or destroy critical habitat of such species, unless overriding factors are present, or if reasonable alternatives to the project are available that would prevent such jeopardy. Mitigation and enhancement measures may be incorporated into a project to avoid a finding of jeopardy. The DFG's website provides access to a variety of information relating to wildlife and habitat

conservation including information on wetlands, deer habitat, streambed alteration, and the California Natural Diversity Database (CNDDB) which provides information on special status species.

Lead agencies are required to consult with the DFG and to obtain written findings when preparing an EIR in order to determine the impact of a project on a threatened species. If the DFG determines that jeopardy will result from a project, the DFG must advise the lead agency of reasonable and prudent alternatives to the project. If the recommended alternatives are infeasible, the lead agency may still approve a project if it (1) requires mitigation and enhancement; (2) the benefits clearly outweight the benefits of the recommended alternatives; (3) no irreversible or irretrievable commitment of resources has been made; and (4) a project will not result in likely extinction of the species.

The DFG administers some public lands in Mono County for wildlife habitat and implements its deer herd management plans throughout the County.

CALIFORNIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT [www.hcd.ca.gov]

The California Department of Housing and Community Development is responsible for:

- Administering State and Federal housing finance, rehabilitation, and economic development programs;
- Promoting the development of housing policies and programs, including the administration of Housing Element law and the development of information on housing need and availability;
- Analyzing, enforcing and participating in the development of building codes, manufactured housing standards, and mobilehome park and employee housing regulations.

CALIFORNIA DEPARTMENT OF TRANSPORTATION [www.dot.ca.gov; Bishop District 9 office -- www.dot.ca.gov/dist 9/]

Caltrans develops policies and programs related to the development of state and federal highways in the county, maintains those highways, and comments on the potential impacts of projects on the highway system. Staff from Caltrans District 9 office works with the Mono County Local Transportation Commission to update the County's Regional Transportation Plan and to implement state and local transportation plans and policies.

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT (GBUAPCD) [California Air Resources Board -- arbis.arb.ca.gov; GBUAPCD not online]

The California Air Resources Board (ARB) regulates mobile sources of air pollutants and coordinates and oversees the activities of the State's regional air quality agencies. The ARB and the regional air quality agencies operate a number of air quality monitoring stations throughout the state. Data collected at these stations are used by ARB to classify areas as "attainment" or "non-attainment" with respect to the federal standards. The ARB also establishes state ambient air quality standards and state emission standards for new vehicles, which in many cases are more stringent than the federal standards. In California, the more stringent of the federal and

state standards applies; however, current air quality planning activities are focused on federal ambient air quality standards.

Mono County is under the jurisdiction of the Great Basin Unified Air Pollution Control District (GBUAPCD). As the regional air quality agency, the GBUAPCD is responsible for the development of "non-attainment plans" and has primary responsibility for regulating air pollutant emissions from stationary sources. By authority of its permitting power, the GBUAPCD can impose conditions on new or modified stationary sources. In addition, the GBUAPCD has established secondary source permitting requirements for such developments as ski areas, restaurants, hotels, and parking structures which attract substantial motor vehicle traffic. The GBUAPCD has adopted a PM_{10} (10 micron particulate matter) non-attainment plan for the Town of Mammoth Lakes and an ozone non-attainment plan for the entire county.

LAHONTAN REGIONAL WATER QUALITY CONTROL BOARD (LRWQCB) [State Water Resources Control Board -- www.swrcb.ca.gov; LRWQCB -- www.mscomm.com/~rwqcb6/]

The Lahontan Regional Water Quality Control Board (RWQCB) has jurisdiction over water quality in Mono County. The North and South Lahontan Basin Plans address water quality issues in Mono County. The plans specify actions to preserve and enhance water quality and protect beneficial uses for the maximum benefit of the people of the State of California. They specifically consider the unique physical, economic, and social conditions of the basins in developing the best practicable water quality management scheme.

The Lahontan RWQCB also administers the National Pollution Discharge Elimination System Permit (NPDES) which applies if more than five acres of site disturbance will occur. For development in areas with wetlands, the LRWQCB administers the 401 permit process.

FEDERAL AGENCY PLANS AND POLICIES

NATURAL RESOURCES CONSERVATION SERVICE [www.nrcs.usda.gov]

The Natural Resources Conservation Service (formerly the Soil Conservation Service) is responsible for a variety of programs to assist people with conservation needs, including the following:

Soil Survey Program;
Watershed Surveys and Planning;
Watershed Protection and Flood Prevention Operations;
Grazing Lands Conservation Program;
Wetlands Reserve Program; and
Resource Conservation and Development.

U.S. ARMY CORPS OF ENGINEERS [www.usace.army.mil/]

A U.S. Army Corps of Engineers Section 404 (Clean Water Act) permit, often called a "404" permit, must be obtained by any person or public agency proposing to discharge dredged or fill

material into waters of the United States, including wetlands. Fill material can include sand, gravel, dirt, clay, and stone.

The River and Harbor Act of 1899 (Section 10) gives the Corps permit power over activities in navigable waters. Typical activities which require Section 10 permits include artificial canals, artificial islands, beach nourishment, boat ramps, breakwaters, bulkheads, dams, dikes, and weirs. Navigable waters originally were defined as those suitable for commercial transport. Court decisions have widened the definition of navigable waters and have expanded the Corps' regulatory jurisdiction. "Navigable waters" now include rivers, adjacent wetlands, lakes, and intermittent streams that, under specified conditions, are tributary to navigable waters.

If a public or private landowner in Mono County suspects that wetlands may occur on a site proposed for development, he should obtain a determination from the appropriate District Office of the Corps regarding the extent of "jurisdictional" wetlands on the property. The Corps evaluates projects by weighing the economic benefit of the proposal against any adverse impacts. The analysis involves a broad range of issues including public safety, water quality, land use impacts, historical value, and conservation and wildlife. Projects proposed in certain wetland areas, but which are not water dependent, may be subject to an extensive alternatives analysis before being approved or rejected. The current nationwide policy of no net loss of wetlands is being rigorously implemented by the Corps and commenting agencies.

U.S. FISH AND WILDLIFE SERVICE [www.fws.gov]

The Fish and Wildlife Coordination Act calls for consultation from U.S. Fish and Wildlife Service (USFWS) regarding impacts on migratory birds, wetlands, and other fish and wildlife resources from federally funded or permitted projects which may affect streams and water bodies, such as those permitted under Section 404 and Section 10. The Federal Endangered Species Act, like the California Act, protects plant, fish, and wildlife species and their habitats, listed as threatened or endangered, and determines critical habitats for such species. Consultation is required on both private and public projects to determine whether the continued existence of the affected species will be jeopardized.

U.S. FOREST SERVICE -- INYO NATIONAL FOREST [www.r5.fs.fed.us/inyo]

The Inyo National Forest is the largest landowner within the June Lake planning area. These lands are managed in accordance with the Inyo National Forest Land and Resource Management Plan (LRMP), adopted in 1988.

CHAPTER 3
LAND USE

LAND OWNERSHIP PATTERNS

The June Lake Planning Area stretches from the Town of Mammoth Lake's planning area northern boundary to the southern boundary of the Mono Basin National Forest Scenic Area (see Figure 2). The Minarets Wilderness Area forms the planning area's western boundary; Hwy. 395 and a portion of the Mono Basin Scenic Area boundary form the planning area's eastern boundary.

The planning area contains private and public lands located near the June Lake Loop. Private lands are concentrated primarily in the June Lake Village and Down Canyon areas of the June Lake Loop. Land owned by the Los Angeles Department of Water and Power (LADWP) forms the bulk of land north of Grant Lake within the planning area. The remaining land is publicly owned land managed by the Inyo National Forest (see Figures 3A-B).

EXISTING LAND USE

The June Lake Loop has five distinct community areas, primarily located in the Loop's southern half. These areas are Pine Cliff, the June Lake Village, the West Village/Rodeo Grounds, the Down Canyon area, and the Silver Lake Meadow area (see Figure 4). Numerous factors, such as environmental constraints and differing stages of development, give each area a unique identity and its own set of development potential. The following provides a brief synopsis of each area's existing land use (see Figures 4 A-F).

Pine Cliff
Pine Cliff is located off of S.R. 158 (the June Lake Loop) and is removed from most of the Loop's development and scenic resources. Portions of the area are used for recreational camping and gravel mining and processing operations. The remainder consists of relatively flat lands with sagebrush and scattered pines. The area is publicly owned land managed by the Inyo National Forest; future development will require special use permits from the US Forest Service (USFS).

June Lake Village
The Village is the Loop's commercial-residential center and its most vital component. The Village contains the Loop's general store, post office, several restaurants, motels, commercial offices, retail stores, community center/library, and park. The meadow area between June Lake and Gull Lake contains a mix of residential uses, including trailer parks, single family homes, condominiums, motels, and vacant lots.

West Village/Rodeo Grounds
This area contains ballfields and a five-acre condominium project. The 145 acres of the West Village/Rodeo Grounds represents the largest portion of undeveloped privately owned land within the June Lake Loop.

Down Canyon

Seasonal and year-round single-family residential use is the predominant land use in the Down Canyon area. A few pockets of commercial development and lodging establishments also border

FIGURE 3A
INTRA-LOOP PRIVATE LAND BASE

FIGURE 3B
PLANNING AREA LAND BASE

FIGURE 4A
EXISTING LAND USE, JUNE LAKE LOOP

FIGURE 4B
EXISTING LAND USE, PINE CLIFF

FIGURE 4C
EXISTING LAND USE, JUNE LAKE VILLAGE

FIGURE 4 D
EXISTING LAND USE, WEST VILLAGE/RODEO GROUNDS

FIGURE 4 E
EXISTING LAND USE, DOWN CANYON

FIGURE 4F
EXISTING LAND USE, SILVER LAKE MEADOW

S.R. 158. The majority of private land in the Down Canyon area has been developed; scattered pockets of undeveloped land exist along S.R. 158.

Silver Lake Meadow

Silver Lake Meadow consists largely of potential and identified wetlands; as a result, the area's development potential is limited by federal wetland development guidelines. SCE's Rush Creek generating plant is located in this area.

Private Lands Outside Community Areas

Two pockets of non-federal land outside of the June Lake Loop exist in the June Lake planning area. The first is located adjacent to the eastern shore of Walker Lake and includes some single-family summer homes. The other area of private land, located north of Grant Lake, is owned by the Los Angeles Department of Water and Power (LADWP) and is managed as open space.

PROPOSED COMMUNITY DEVELOPMENT

Policies in the June Lake Area Plan focus on improving June Lake's recreational economy by expanding summer and winter recreational facilities and housing in a manner that maintains the area's existing mountain village character. New development allowed in the Area Plan would be concentrated in and around existing community areas, such as June Lake Village, the Rodeo Grounds, West Village and Down Canyon areas. The Pine Cliff area is designated as a conditionally developable area. Land exchange areas are designated in locations bordering the Down Canyon area. Silver Lake Meadow and lands on the southern slope overlooking June Lake Village are proposed for limited development or exchange into public ownership. The following provides a brief overview of proposed land uses in June Lake's various community areas. Maps showing land use designations for private lands in the June Lake Loop are contained in the June Lake Map Set in Appendix A.

Pine Cliff

Proposed land uses in the Pine Cliff area include industrial storage, gravel batch plant processing operations and other light industrial uses. Development in this area is contingent on studies that show that proposed uses are inconsistent and incompatible with existing or proposed uses in other developed community areas. This land use strategy is designed to prevent "leap frog" development by concentrating growth in existing community areas. A land exchange with the US Forest Service and the preparation of a Specific Plan must take place prior to developing this area. Existing USFS special use permits are consistent with Area Plan policies and land use designations.

June Lake Village

The June Lake Village will continue to serve as the Loop's commercial center. Land along S.R. 158 is designated for commercial uses, such as retail space, offices, and lodging facilities. The meadow area between June Lake and Gull Lake includes a mixed use area, intended to promote smaller scale retail or office space and rental housing. The mixed use area is bordered by areas designated for higher density housing along the land closest to June Lake and Gull Lake. Lands on the southern slope overlooking the Village are designated for exchange into public holdings, if feasible.

West Village and Rodeo Grounds

The majority of undeveloped lands in the West Village and Rodeo Grounds are designated for resident and second homeowner housing, recreational facilities, and open areas. Commercial nodes are also planned to provide full-service hotels, convention facilities, large restaurants,

night clubs and other intensive commercial uses. The June Lake Area Plan requires that development in this area occur under a single Specific Plan. The Specific Plan would balance housing, recreational and entertainment facilities; promote pedestrian traffic; and require compatible architectural designs. The June Lake Area Plan also proposed a coordinated circulation system using mass transit, ski lifts, pedestrian trails, and bicycle paths/cross-country ski trails for this area.

Down Canyon

Land use in the Down Canyon area will remain primarily single family residential development with limited commercial and recreational uses for a few areas along S.R. 158. Areas with adequate access are designated for moderate density residential and commercial lodging uses. The June Lake Area Plan proposes two land trade areas in the Down Canyon area.

Silver Lake Meadow

The Silver Lake Meadow is designated as a Natural Habitat Protection District, which allows for limited development in non-environmentally sensitive areas. The June Lake Area Plan proposes this area for future land exchange into public holdings.

Private Lands Outside Community Areas

Two pockets of non-federal land outside of the June Lake Loop exist in the June Lake planning area. The first is located adjacent to the eastern shore of Walker Lake and includes some single-family summer homes. This area is designated as Planned Unit Development with minimum lot sizes of two acres. The other area of private land, located north of Grant Lake, is owned by the Los Angeles Department of Water and Power (LADWP) and designated for open space.

BUILDOUT AND SUSTAINABLE DEVELOPMENT

Peak population estimates for private lands in June Lake are shown in Table 1. Estimates are based on the proposed future land uses and the estimated population densities of the various community areas. Based upon the land use policies contained in the June Lake Area Plan, the estimated peak period visitor population is 10, 817 persons at full buildout. The Down Canyon and West Village/Rodeo Grounds areas are expected to house the majority of the population. The population estimates assume full development of all private lands but do not account for usage of cabins or camping facilities located on national forest lands. The estimates also assume an 85 percent occupancy rate for all housing units.

Assuming that the existing number of campsites and US Forest Service permittee cabins remain constant, an additional 1,881 persons can be anticipated (1,608 campground users, 273 summer cabin permittees) for a total of 12,698 persons. This assumes that new development will attract more people to the area rather than shift historic users of the area to different types of accommodations. It is anticipated that this scenario could only occur after the US Forest Service opens their camping and permittee housing areas during the summer.

The sustainable nature of development within the June Lake Loop depends on the availability of infrastructure to serve additional development without impacting the natural environment and small-town nature of the community area's within the Loop. The primary infrastructure components that will determine the rate and extent of future growth in the June Lake Loop are water and sewer services and the transportation/circulation system. These are discussed in Chapter 4, Community Services and Facilities, and Chapter 7, Transportation.

CHAPTER 4
COMMUNITY SERVICES AND FACILITIES

Community services include general governmental services such as public works, planning, administration, health care, and justice, and emergency services including police and fire protection, paramedic services, and search and rescue. Community facilities include public infrastructure such as utilities, schools, community buildings, roads and recreational facilities. Roads are discussed in the Transportation section of this document; recreational facilities are discussed in the Outdoor Recreation section; emergency services are discussed in the Emergency Services section of this document.

COUNTY SERVICES AND FACILITIES

Mono County provides general governmental services to county residents; these services include the following:

Administration	Health Services	Public Works
Animal Control	Justice and Courts	Sheriff
Community Development	Library Services	Social Services
Finance	Parks and Recreation	Tax Collection

County services are provided in Bridgeport, the county seat, and through branch offices in Mammoth Lakes. County services in Bridgeport are provided primarily in the County Courthouse and the two Courthouse Annex buildings. Services in Mammoth are provided at leased offices in Mammoth Lakes. Information on county services and departments will soon be available at www.monocounty.ca.gov. Information on the courts is available at www.courtinfo.ca.gov/courts/trial/mono.

The County operates recreational and community facilities in most communities; those facilities are discussed in the Outdoor Recreation section of this document. Other facilities operated by the County include cemeteries, landfills, and roadyards. The County operates cemeteries at Bridgeport, Mono Lake, and Long Valley. Landfills are currently located in Walker, Bridgeport, Benton, Chalfant, Benton Crossing, and Pumice Valley; the county is in the process of converting the landfills at Walker, Bridgeport, Benton and Chalfant to transfer stations. A transfer station is currently located at Paradise. The County operates roadyards at Benton, Crowley, Mammoth, Lee Vining, Bridgeport, and Walker. Road maintenance operations are discussed in detail in the Transportation section of this document.

HEALTH SERVICES

The absence of public or private health care services in the June Lake Loop forces residents and visitors to travel to hospitals, clinics or doctor's offices located outside the Loop. Hospital and emergency medical care services are available at Mammoth Hospital in Mammoth Lakes, 22 miles south of June Lake. Serious cases are transported by air to facilities in Bishop, Reno, Fresno, or Southern California, depending on the case. Basic health care services are provided in Mammoth Lakes and at the Mono General Clinic in Bridgeport.

The Mono County Department of Public Health [www.monohealth.org] provides a variety of health care services at medical facilities located in Mammoth Lakes and Bridgeport. The Department acts as an information and referral center, providing health education materials and preventive medicine services, such as immunizations and screenings for a variety of conditions. The Department also administers a variety of state-mandated public health programs. Mental health services are provided through the County Mental Health Department with offices located in Mammoth Lakes.

EDUCATIONAL SERVICES

Primary and secondary education is provided by the Eastern Sierra Unified School District (see www.monocoe.k12.ca.us/esusd/index.html) at the Lee Vining Elementary School and Lee Vining High School facilities located in Lee Vining. Existing capacities and enrollments (2000-2001) at each of these schools are contained in Table 1.

TABLE 1
School Capacity and Enrollment, Lee Vining Schools, 2000-2001

	Capacity	Enrollment
Lee Vining Elementary (K-6)	130	94
Lee Vining High School (7-12)	125	34

Although Lee Vining schools are not currently overcrowded, other schools within the Eastern Sierra Unified School District are; the school district has consequently been formally identified as "impacted". As an impacted district, it possesses the authority to impose fees on new construction for capital outlay and permanent classroom construction (Mono County Code Section 15.09).

The **June Lake Residence Study** (1986), conducted by the June Lake Citizens Advisory Committee, indicated a significant number of residents rated existing school services as inadequate. Some parents, dissatisfied with the program, have transferred their children to the Mammoth Lakes Unified School District where educational and extracurricular opportunities are reportedly greater.

Adult education opportunities in the county are available in Mammoth Lakes. The Mammoth branch of the Eastern Sierra College Center, a division of Cerro Coso Community College, offers classes leading to a two-year Associate of Arts degree (see www.cc.cc.ca.us/escc/default.htm). The Town's Parks and Recreation Department offers a variety of recreational and adult education classes.

LIBRARY

The Mono County Library District, administered by the County Board of Education, operates a countywide library system. A branch library is located at the June Lake Community Center. Services provided by the library district include an online catalog (www.monocoe.k12.ca.us/libraries.htm), interlibrary loan services, and a traveling Bookmobile that makes scheduled stops throughout the Loop.

COMMUNITY CENTER

The June Lake Community Center provides a central meeting facility and focal point for the community. Located adjacent to Gull Lake in the June Lake Village, the center is owned by the County and includes a large multi-purpose room complete with kitchen and restroom facilities. The center also houses the library and community thrift shop and contains space for health care facilities.

PARKS

The June Lake Loop has two community parks, one adjacent to the June Lake Community Center near Gull Lake and the June Lake Ballfield, located northwest of the West Village area. Park facilities at the June Lake Community Park adjacent to Gull Lake are limited to a few picnic tables, swing sets, slides, a single tennis court, one basketball backboard and court located in the Community Center parking lot and a public restroom facility.

The June Lake Ballfield is located on five acres of public lands under special use permit to Mono County from the Inyo National Forest. Park facilities include a regulation baseball field with backstop, dugouts and bleachers, portable restrooms, a gravel parking area and a gravel access road. Future plans for the site include another baseball field or soccer filed, picnic facilities and BBQ sites, landscaping, permanent restrooms, walking trails, biking trails, and kids play area.

WATER SYSTEM

The June Lake Public Utility District (JLPUD) provides the bulk of water services in the Loop. The district's boundaries run from the northeast corner of June Lake west to the northern boundary of Silver Lake (see Figure 5). The district's service areas include the Village, West Village and Down Canyon, all within the district boundaries, and Pine Cliff, Oh! Ridge, and June Lake Junction, outside of the district boundaries.

Detailed information on the June Lake Public Utility District's water system is provided in the **June Lake Public Utility District Master Water Plan Update** (Boyle Engineering, 1999). The following discussion is excerpted from that report.

Existing Water System

There are two separate water systems in the District, the Village system and the Down Canyon system. There is no pipeline connection between the two systems and they utilize different water sources. The Village system is supplied by June Lake and Snow Creek (Twin Springs). The Down Canyon system is supplied by Yost Creek and Fern Creek. Water is supplied to each system through existing diversion rights for the June Lake Public Utility District and the US Forest Service/Inyo National Forest (see Tables 8 and 9 in the JLPUD Master Plan Update). Water obtained under the diversion rights issued to the Inyo National Forest is used to supply the campgrounds owned/leased by individuals on national forest lands within the JLPUD boundaries.

The JLPUD's system includes four storage facilities:

- June Lake Tank has a capacity of 225,000 gallons and serves as the backup storage facility for the Village system and the primary provider for the Oh! Ridge campground;

- Snow Creek Tank has a capacity of 376,000 gallons and is the main storage facility for the Village system;
- Peterson Tank has a storage capacity of 225,000 gallons and serves the Down Canyon system;
- Clark Tank has a storage capacity of 426,000 gallons and also serves the Down Canyon system.

FIGURE 5
June Lake Public Utility District Boundaries

The JLPUD's distribution system in the Village is fairly old and is comprised of approximately 43,000 feet of ductile iron and steel pipeline ranging in size from 1-inch to 10 inches in diameter. The Down Canyon distribution system is relatively new and is comprised of approximately 41,000 feet of ductile iron and steel pipeline ranging in size from 1-inch to 10 inches in diameter. No major improvements have been made to either system. Minor pipeline repairs and additions have been made to keep up with growth demands. The JLPUD Master Plan Update contains schematic drawings that provide detailed information about the location of the district's supply sources, treatment facilities, storage facilities, and distribution system.

Water System Demand

The JLPUD Master Plan Update analyzes present and future water demands within the JLPUD boundaries in order to determine whether the system has sufficient capacity to meet those demands. The Master Plan concludes the following concerning present water demand:

- The Village and Down Canyon systems have sufficient diversion rights to meet the present Maximum Month Average Daily Demand and Yearly Demand.
- The Village and Down Canyon systems have sufficient water treatment facility capabilities to meet the present Maximum Month Average Daily Demand.
- The Village and Down Canyon systems have sufficient reservoir capacity for present water demands.
- The Village distribution system is capable of supplying water to most areas of the system with adequate pressure (above 20 psi) during the maximum month average day demand (194 gpm). The Rodeo Grounds development was not included in the analysis because the proposed Rodeo Grounds storage tank would be located so that the Rodeo Grounds development would not affect the function of the rest of the system.

  The Village distribution system includes approximately 15,500 feet of 1- to 3-inch diameter pipelines that are unable to handle more than 100 gpm.

  The volume of the reservoirs in the Village distribution system is adequate.

  Improvements are needed to the Village distribution system in order to meet the design fire flows shown in Figure 4 in the Master Plan Update.

- The Down Canyon distribution system is capable of supplying water to all areas of the system with adequate pressure (above 20 psi) during the maximum month average day demand (215 gpm).

  The Down Canyon distribution system pressure tends to be on the high side (above 100 psi).

  The system contains very few 1- to 3-inch diameter pipelines that are unable to maintain flows greater than 100 gpm.

  Approximately 84 % of the system is capable of maintaining the recommended fire flow shown on Figure 5 of the Master Plan Update.

  The system reservoirs are adequate to meet supply throughout the existing system.

The Master Plan concludes the following concerning future water demand:

- The District is capable of meeting projected water demands at buildout, even with the proposed Rodeo Grounds development, with their existing diversion rights, provided Village water rights can be used to meet projected Down Canyon water demands.
- The District's treatment facilities do not have the capacity to meet buildout demand. The Village system needs an additional treatment facility capacity of approximately 424,000 gpd and the Down Canyon system needs approximately 272,000 additional gpd.
- The Village system will need an additional gross storage volume of 1,699,000 gallons (1,359,000 gallons net) at buildout. The Down Canyon system will need an additional gross volume of 508,000 gallons at buildout.
- The Village distribution system is inadequate to meet estimated present demand and, therefore, is inadequate to meet increasing demand as the Village develops. The major problems with the system are undersized pipelines, poor condition of pipe material, and deadend lines.

  The Down Canyon distribution system is adequate to meet present demand but is inadequate to meet increasing demand as the Down Canyon develops.

Recommended System Improvements
Section 6 of the JLPUD Master Plan Update contains recommended improvements to the District's system in order to meet the present and projected future water demand. The Master Plan contains specific recommendations for all aspects of the system. Recommended improvements for the distribution system are ranked according to priority of installation/replacement (see Figures 10 and 12 in the Master Plan0. The Master Plan also contains estimated costs for the recommended improvements.

Water Quality
Water quality tests of the JLPUD's water sources indicate that the water quality is generally very good from the mineral standpoint. The water is very low in hardness and alkalinity. Additional information on water quality is contained in the water resource section of this document.

WASTEWATER FACILITIES

The June Lake Public Utility District operates and maintains a loop-wide sewage system (Figure 31). Sewer facilities consist of 4", 6" and 8" gravity collectors; 12" and 15" interceptors; 4", 8", 10", 12" and 14" force mains; 34 sewage lift stations; a one million gallon per day (mgd) extended aeration activated sludge sewage treatment plant; and four evaporation/percolation effluent disposal ponds. Treatment facilities are located west of U.S. 395, approximately a mile and half south of the north junction of U.S. 395 and S.R. 158.

Records indicate that the community currently generates an average daily sewage flow of 250,000 gpd or approximately 25% of the treatment facility's design capacity. Following a few pump station modifications and oxidation ditch aeration system improvements, the District believes the system has adequate capacity to meet the area's sewer needs at full buildout.

STORM DRAINAGE FACILITIES

Drainage and Runoff Issues in June Lake

Past development activities conducted under limited local and state control have resulted in moderate to significant increases in runoff from impervious surfaces. While increases in runoff have occurred, drainage improvements have not taken place. Instead, drainage improvements have been installed by individual property owners in response to site-specific conditions and drainage problems. In most areas in June Lake, lands are currently drained by sheet flow to existing roads and unlined ditches. Culverts at road crossings, where they do exist, have been installed without proper design considerations, often resulting in ponding or other adverse effects. Fast moving sheet flows off impervious surfaces sometimes uncover underground utilities constructed within road rights-of-way and during severe rainstorms surface flows have flooded developed areas and washed-out roads. In addition, uncontrolled runoff has accelerated erosion on adjoining lands and increased the sediment and nutrient levels in local water bodies, particularly Gull Lake. The discharge of oil and other petroleum products from developed lands and local roadways, may also be contributing to the degradation of surface and ground waters. As development continues there will be an increase in land coverage by impervious surfaces and an overall increase in runoff during spring snow melts and heavy or extended summer rainstorm periods.

Existing Storm Drains

The only storm drainage system in the Loop exists in the June Lake Village. Concurrent with the improvement of S.R. 158 through the Village central business corridor, Caltrans constructed a network of grates, catch basins and underground culverts to catch and divert runoff. Water, soils, petroleum products and other materials carried in the runoff are collected, transported and ultimately discharged into an open drainage canal which starts between Crawford and Raymond Avenues and flows into the open channel running between June and Gull Lakes[1]. A smaller system, which collects runoff on Crawford Avenue, is also connected to the state system.

Potential Storm Drain Improvements

In 1982, the Mono County Public Works Department conducted a preliminary study of the June Lake Village's drainage problems. The study outlined two alternatives for correcting drainage deficiencies. Alternative 1 called for a comprehensive, areawide drainage system including street and curb construction, improvements to the channel between Gull and June Lakes and installation of a significant amount of underground conduit. Alternative 2 involves a series of localized drainage improvements consisting of surface drainage channels and streets with curb and gutters. Cost estimates in 1982 were $1,000,000 and $250,000, respectively.

The open channel between June and Gull Lake, the backbone of both drainage alternatives, currently collects natural and man made surface and subsurface drainage flows out of June Lake and the June Lake Village meadow area. In its current configuration, the channel is extremely susceptible to pollution and could lead to the further degradation of Gull Lake's water quality. Other problems attributed to its open condition include stagnation from low flows, instream

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[1] Recent discussions with the California Department of Fish and Game (DFG) and the US Forest Service indicate that Reversed Creek between June and Gull Lakes has insignificant aquatic-riparian habitat and recreational resource values. As a result, it can be concluded that the creek's primary function should be providing overflow for June Lake and drainage for the June Lake Village.

plant growth, blockages from the accumulation of debris in narrow sections and winter ice-damming.

The June Lake Citizens Advisory Committee recommended two options to enhance the channel's value as a drainage channel, to eliminate ongoing water quality problems, and to resolve existing land use conflicts resulting from its present alignment. The first proposal would leave the channel in its natural state while improving its shape to enhance flow characteristics. The second proposal would enclose the channel and change its alignment to roughly parallel Alderman and Granite Streets. Either alternative would necessitate constructing a sedimentation basin/treatment system upstream of Gull Lake to prevent the deposition of silt and other contaminants.

Storm Drainage and Flood Control Maintenance

Presently, storm drain and flood control facilities in the Loop are not maintained, operated or improved on a regular basis. The Mono County Public Works Department has provided emergency storm drain or flood control services.

TELEPHONE SERVICE

Verizon provides telephone service for the June Lake Community. Approximately 650 service connections are in use at the present time. The current digital switching system has the capacity to handle up to 10,000 lines and to provide expanded custom call features including call forwarding, call waiting, speed calling and three-way calling.

Verizon has estimated that demand for phone service will increase by approximately three to four percent per year. At this rate of growth and the relatively large capacity of the new digital system, Verizon does not anticipate any significant problems in meeting customer phone service demands at community buildout.

SOLID WASTE

Solid waste generated in June Lake is disposed of at the Pumice Valley Landfill, located approximately eight miles north of the June Lake Village. The LADWP leases the site to the County, on a 20 year renewable basis. A private contractor under agreement with the Mono County Department of Public Works maintains and operates the site. The facility's remaining useful life is estimated at around 50 years.

Curbside refuse service is not provided due to the community's relatively low housing density and the extreme costs associated with such a program. Private contractors provide bin service and garbage removal from residences contracting for services. Residents and businesses not contracting for service use private vehicles for hauling.

HAZARDOUS WASTE

The amount of hazardous waste generated in Mono County is not well understood at the present time. During the preparation of the County's Hazard Waste Management Element, estimates indicated that 600 tons of hazardous wastes were generated countywide in 1986. The estimates identified small quantity generators and households as the major contributors of hazardous wastes. Small quantity generators produced an estimated 90% of the waste, while households

generated the remainder. By weight, the major sources of hazard wastes in the County include lead-acid batteries, cleaning solutions (organic solvents and inorganic liquids) and spent motor oil.

New development in June Lake is anticipated to generate a hazardous waste stream that is similar to the rest of the County. Estimates on quantiy of wastes anticipated have not been generated, although new development in the June Lake area is not anticipated to greatly increase the amount generated. Operations likely to produce hazardous wastes include small quantity generators such as the Ski Area, vehicle maintence stations (service stations and garages), dry cleaning and laundry operations and construction industry contractors. Households are also anticipated to generate hazardous wastes.

EMERGENCY SERVICES

LAW ENFORCEMENT

Mono County Sheriff

The Mono County Sheriff's Department provides law enforcement, crime prevention, search and rescue and limited traffic and vehicle code enforcement for June Lake and other unincorporated areas of the county. Service is provided from the county seat in Bridgeport, a substation in Mammoth Lakes, and a resident deputy program. The June Lake service territory ranges from Conway Summit to the north to Crestview to the south. The Sheriff's Department is responsible for coroner operations, processing and serving civil paperwork, and the county's 911 Emergency Communication System. The Sheriff is the designated County Director of Emergency Services and is responsible for implementing the Mono County Emergency Plan.

California Highway Patrol

The California Highway Patrol (CHP) has primary responsibility for enforcing vehicle codes and investigating vehicle-related accidents on county and state roads. When not on patrols, CHP vehicles are dispatched from officer residences in the June Lake area via radio communication with the district station located in Bridgeport. The June Lake Loop falls within a larger service territory covering state and county roadway systems between the Caltrans Crestview Maintenance Station and S.R. 167. Response times to calls originating from the June Lake area vary depending on the location and the status of patrol vehicles at the time of the call.

FIRE PROTECTION

Structural Fire Suppression

The June Lake Fire Protection District (JLFPD) is a 28 member volunteer fire department that provides structural fire protection to the June Lake Village area and to contracting businesses and residents in the Down Canyon area (Figure 6). The Down Canyon and Pine Cliff areas are not in the fire protection district, forcing property owners to contract for services. The district also provides emergency medical servicse, primarily as backup assistance or first response service to the County's paramedic unit. The Fire Chief estimates that 40% of all calls are fire related, while 60% are accidents or medical emergencies. The JLFPD has a mutual aid agreement with ten other fire protection districts in the county; that agreement formalizes the procedure for each district to send personnel and equipment to fires and medical emergencies beyond district boundaries when needed.

Volunteers are dispatched to fires and other emergencies within the JLFPD service area via the Mono County Sheriff's Department 911 Emergency Communication System. Volunteers alerted

to the call by scanners, pagers or strategically placed sirens respond by meeting at the Big Rock Road Station where vehicles are manned and dispatched. Existing equipment includes three engines, one rescue truck, one water tender, one brush rig, one ladder truck, and three utility trucks.

The district is administered and managed by a fire chief, an assistant chief and a five member Board of Commissioners. Existing district policies call for developer exactions to mitigate the impact of new development on district facilities (Resolution 82-2 and 84-4) and provide a formula, based upon the tax rate and assessed value, for calculating fees for contract fire protection service (Resolution 75-2). The district has also informally recognized the fire protection needs of Down Canyon and is investigating potential fire station locations in that area. Situating a fire station in this area would significantly reduce response time.

FIGURE 6
JUNE LAKE FIRE PROTECTION DISTRICT SERVICE AREA
AND SPHERE OF INFLUENCE

The current Insurance Service Office (ISO) rating for locations served by the JLFPD is four for everything within five miles of the station and nine for locations from Oh! Ridge to the June Lake Junction. Ten represents the lowest level of protection, the greatest fire hazard, and generally higher insurance rates. The district's fire chief has indicated that the water supply and fire flow pressure in most of the Village area are marginal and that fire equipment and vehicles have difficulties accessing many areas of June Lake, particularly during the winter. Water facility improvements by the June Lake Public Utility District could greatly enhance the fireflow conditions.

Wildland Fire Protection

Wildland fire protection services on public lands surrounding June Lake are provided by the Forest Service while the California Division of Forestry is responsible for controlling wildland fires on private lands. Under mutual aid agreements both agencies will respond to large wildland fires.

PARAMEDIC SERVICES

Paramedic service for June Lake and the surrounding area is provided by Mono County under the direction and supervision of the Mammoth Lakes Fire Protection District chief. A winterized mobile intensive care unit, manned on a 24 hour/day basis by a two man certified paramedic team, is housed at the June Lake Fire station located at S.R. 158 and Big Rock Road. Mobile units are dispatched via the Mono County Sheriff's Department 911 Emergency Communication System.

CHAPTER 5
DEMOGRAPHICS AND ECONOMIC DATA

POPULATION

Mono County's population in 2000 was 12,853 persons, with 5,759 persons in the unincorporated area, an increase of 11.4 percent from 1990 (2000 U.S. Census, Table DP-1). June Lake's population was 613 persons in 2000 (10.64 percent of the total unincorporated population), an increase of 5.5 percent from 1990 (2000 U.S. Census). Recent population estimates prepared by the State Department of Finance (DOF) show the countywide population to be 13,250 in 2002, an annual increase of 2.3 percent, and the unincorporated population to be 5,850, an annual increase of 2.2 percent (www.dof.ca.gov, Population Estimates Table E-1).

Population projections prepared by the State Department of Finance have not yet incorporated 2000 U.S. Census data. As a result, the 2000 U.S. Census population for Mono County exceeds the 2010 population projection prepared by DOF. Once DOF updates its projections in response to the 2000 Census data, this section will be updated to include current population projections for June Lake.

June Lake's resort/tourism economy causes wide fluctuations in the population and creates some difficulty in accurately projecting the population. In addition to permanent year-round residents, the population includes seasonal residents, seasonal employees, and short-term visitors.

Summer Peak Population

The Loop's population peaks during the summer months when seasonal second homeowners and short-term visitors join permanent year-round residents. Summer time populations are influenced by the availability of US Forest Service campsites, summer homes, and privately-owned recreational facilities that are open only in the summer. Summer peak population estimates are shown in Table 2. This table assumes that people enjoying summer time activities in the Loop spend the night in the Loop; day users are excluded from the population calculations.

TABLE 2
June Lake Estimated Summer Peak Population

HOUSING TYPE	UNITS	PERSON/ UNIT	TOTAL
Single Family Residential (SFR)	////	////	////
Condominiums			
Apartments			
Mobile Homes			
Motels			
TOTAL			
CAMPGROUND	**SITES**	**PERSON/ SITE**	**TOTAL**
Oh! Ridge Campground	144	3	432
Pine Cliff Trailer Park	200	3	600
June Lake Campground	22	3	66
Gull Lake Campground	17	3	51
Reversed Creek Campground	18	3	54
Silver Lake Campground	65	3	195
Grant Lake Campground	70	3	210
TOTAL	536	------	1,608
LOOPWIDE TOTAL	/////	/////	/////

Sources:
1. June Lake Public Utility District, 2002.
2. Person/unit figures for the housing reflects the following occupancy rates:
SFR--80 %, Condominiums--90 %, Apartments & Mobile Homes--100 %, Motels--95 %.
3. Person/unit figures for campgrounds reflect a 100 % occupancy rate.

Winter Peak Population

Winter peak populations are estimated to be roughly 60 percent of summer peak populations. The closure of USFS and private campgrounds during the winter and the USFS policy of prohibiting winter usage of USFS permittee homes accounts for this difference. Though the winter peak figure is much lower than the summer peak figure, population concentrations are expected to be higher since campgrounds and the northern half of the Loop are closed.

During the winter, day users of June Mountain increase the daytime population of June Lake. A typical way to measure this demand is to compare the community's ability to accommodate residents and visitors and the anticipated number of skiers. The method commonly used compares the relationship of SAOT (skiers at one time) to PAOT (persons at one time). SAOT is defined as all persons engaged in downhill skiing on a specific day while PAOT is defined as all persons in the community on a specific day, including residents, visitors, shoppers, and workers.

Day use visitation associated with June Mountain Ski Area is expected to increase as the Ski Area expands its operations. The Ski Area has a current capacity of 2,250 SAOT and US Forest Service approval to expand to 3,900 SAOT. The Inyo National Forest Land and Resource Management

Plan identifies an ultimate potential SAOT of 7,000 for the Ski Area. June Lake has historically lacked sufficient overnight accommodations for the peak winter PAOT population, leading to a daily in-migration of skiers in the morning, and an out-migration in the after the lifts close, primarily to Mammoth Lakes.

Estimated Population at Buildout

Estimated population at buildout can be calculated for both the permanent resident population and the peak period visitor population which would occur in the summer when campgrounds and US Forest Service permittee cabins are occupied.

Table 3 shows the projected dwelling unit buildout for June Lake. This table is from the Mono County General Plan Land Use Element. Table 4 contains population buildout calculations for June Lake.

The maximum potential population at buildout is projected to be 11,700 persons. That figure assumes full buildout of all parcels and full occupancy of all units. Full buildout and full occupancy are not anticipated to occur, however, due to the seasonal recreational economy in June Lake. The permanent resident population at buildout is projected to be 4,222 persons; this assumes an occupancy rate of 43 percent (2000 U.S. Census, Table DP-1).

The peak period visitor population at buildout is projected to be 6,103 persons (4,222 permanent population + 1,608 campground users + 273 summer cabin permittees).

TABLE 3
June Lake Projected Buildout

Land Use Designation	Density	Acres	Maximum Potential Dwelling Units
ER Estate Residential	1 du/acre	9	9
RR Rural Residential	1 du/acre		
RMH Rural Mobile Home	1 du/acre		
SFR Single-Family Residential	5.8 du/acre	164	951
MFR-L Multiple-Family Residential – Low	11.6 du/acre	9	104
MFR-M Multiple-Family Residential – Moderate	15 du/acre	9	135
MFR-H Multiple-Family Residential – High	15 du/acre		
MU Mixed Use	15 du/acre	14	210
CL, M Commercial Lodging – Moderate	15 du/acre	21	315
CL, H Commercial Lodging – High	15 du/acre	20	300
RU Rural Resort	1 du/5 acres	152	---
C Commercial	15 du/acre	26	390
SC Service Commercial	---		
IP Industrial Park	---		
I Industrial	---		
RE Resource Extraction	---	132	---
PF Public/Quasi-Public Facilities	---	4	---
RM Resource Management	1 du/40 acres		
OS Open Space	1 du/80 acres		
NHP Natural Habitat Protection	1 du/5 acres	31	6
AG Agriculture	1 du/2.5 ac.		
AP Area Plan	---		
SP Specific Plan	---	145	1,450[a]
Total Private Lands		736	3,870
RM Resource Management – Federal/State	---	46,892	---
OS Open Space – LADWP	1 du/80 acres	8,024	100
Other	---		
Total		55,652	3,970

Notes:
du = dwelling unit
a. 145 acres = Rodeo Grounds Specific Plan which permits 10 du/acre. Other sites identified as SP on the June Lake Land Use Maps reflect potential exchange parcels with the US Forest Service.

TABLE 4
Projected Population at Buildout, June Lake

	Maximum Dwelling Units[a]	Persons/Unit[b]	Maximum Population at Buildout	Resident Population at Buildout[c]
Owner-OccupiedUnits	960	2.39	2,294	986
Renter-Occupied Units	3,010	2.50	7,525	3,236
Campground Users	------	------	1,608	------
Summer Cabin Permittees	------	------	273	------
Total	3,970	------	11,700	4,222

Notes:
a. From Table 3. Assumes units in ER and SFR designations are owner-occupied, all others are renter-occupied.
b. 2000 U.S. Census, Table DP-1.
c. Assumes 43 % occupancy rate from 2000 U.S. Census, Table DP-1.

POPULATION CHARACTERISTICS

The following demographic information is from the 2000 U.S. Census (Table DP-1, Profile of General Demographic Characteristics, and Table DP-3, Profile of Selected Economic Characteristics). The information is only available at the countywide level which includes the Town of Mammoth Lakes.

Ethnic Composition

In 2000, Mono County's racial composition was:

White	84.2 %
Black	0.5 %
American Indian	2.4 %
Asian	1.1 %
Hawaiian/Pacific Islander	0.1 %
Some other race	9.5 %
Two or more races	2.2%

Persons of hispanic heritage, who may be of any race, comprised 17.7 percent of the total population.

Age and Sex Structure

In 2000, the median age of Mono County's population was 36 years. The age structure of the County's population was:

Under 5 years	5.7 %
5 to 9 years	6.5 %
10 to 14 years	7.0 %
15 to 19 years	6.4 %
20 to 24 years	7.8 %
25 to 34 years	15.0 %
35 to 44 years	18.4 %
45 to 54 years	16.1 %
55 to 59 years	5.3 %
60 to 64 years	4.3 %
65 to 74 years	5.2 %
75 to 84 years	1.9 %
85 years and over	0.5 %
18 years and over	77.0 %
21 years and over	73.1 %
62 years and over	10.0 %
65 years and over	7.6 %

Forty-five percent of the population was female, 55 percent of the population was male.

Household Size and Structure

In 2000, the U.S. Census counted 5,137 households in Mono County. The average household size was 2.43 persons; the average family size was 2.98 persons. Types of households counted included:

Family households	61.2 %
Nonfamily households	38.8 %
Households with individuals under 18 years	30.9 %
Households with individuals 65 years and over	13.9 %
Householder living alone	26.6 %

Employment

Mono County's labor force in 2000 included 75.6 % of the population 16 years and over. At that time, 69.6 % of the labor force population was employed in the civilian labor force, 1.8 % was employed in the armed forces, and 4.3 % was unemployed.

Labor Force by Occupation:

Management, professional, related occupations	35.4 %
Service occupations	23.0 %
Sales and office occupations	21.7 %
Farming, fishing, and forestry occupations	0.3 %
Construction, extraction, and maintenance occupations	13.0 %
Production, transportation, & material moving occupations	6.7 %

Labor Force by Industry:

Agriculture, forestry, fishing, hunting, mining	2.8 %
Construction	11.2 %
Manufacturing	3.0 %
Wholesale trade	1.1 %
Retail trade	10.1 %
Transportation, warehousing, utilities	2.3 %
Information	1.5 %
Finance, insurance, real estate, rental and leasing	7.7 %
Professional, scientific, management, administrative, waste management	7.7 %
Educational, health and social services	14.4 %
Arts, entertainment, recreation, accommodation, food services	30.0 %
Other services (except public administration)	2.7 %
Public administration	5.7 %

Labor Force by Class of Worker:

Private wage and salary workers	67.1 %
Government workers	19.3 %
Self-employed workers in own not incorporated business	12.7 %
Unpaid family workers	0.9 %

Income

In 1999, the median household income in Mono County was $ 44,992. The median family income was $ 50,487. Households had income from the following sources:

Earnings	88.2 % of households
Social Security income	16.0 %
Supplemental Security income	2.4 %
Public Assistance income	2.5 %
Retirement income	13.5 %

The per capita income for Mono County in 1999 was $ 23,422. The median income for male full-time year-round workers was $ 32,600; the median income for female full-time year-round workers was $ 26,227.

Poverty Status

In 1999, the poverty status (those with income below the poverty level) in Mono County was:

All families	6.3 %
Families with children under 18	10.9 %
Families with children under 5	12.9 %
Families with female householder, no husband present	22.0 %
Families with female householder with children under 18	27.0 %
Families with female householder with children under 5	18.4 %

Individuals	11.5 %
Individuals 18 years and over	11.1 %
Individuals 65 years and over	1.9 %

CHAPTER 6
HOUSING

OVERVIEW

Housing issues facing June Lake include a general housing shortage for both residents and short-term visitors and a discrepancy between the type of housing provided and the expectations of winter visitors. The availability of affordable housing for rental and purchase is also a problem.

Single-family residences, including permittee cabins on National Forest Lands, are the Loop's predominant housing type.

PUD stuff on housing units here

CONDITION OF HOUSING STOCK

A sizable proportion of June Lake's housing stock was developed over thirty years ago. Countywide, 12.5 percent of housing units were constructed between 1960 and 1969, 37.6 percent of housing units were constructed between 1970 and 1979, 22.8 percent of housing units were constructed between 1980 and 1989 (2000 U.S. Census, Table DP-4, Profile of Selected Housing Characteristics).

Although most residents and visitors consider the housing stock to be in good condition, housing surveys conducted in the early 1980s concluded that the majority of June Lake's housing units needed major rehabilitation or repair at that time (IMAGE Housing Survey, 1981).

LACK OF WINTER HOUSING

The Loop's summer resort orientation has resulted in the construction of housing primarily catering to summer visitors. This housing includes rustic summer cabins and smaller lodges. As a result, little housing exists that is capable of meeting the expectations of winter visitors.

Another problem during the winter is the unavailability of permittee housing on National Forest Lands. Seven pockets of US Forest Service permittee summer homes, containing a total of 105 units, are clustered around June, Gull and Silver Lakes (Southwest June Lake Tract, Northern June Lake Tract, Southern June Lake Tract, Northern Gull Lake Tract, Southern Gull Lake Tract, Lyle Terrace Tract, and Silver Lake Tract). US Forest Service policy prohibits winter occupation of these units.

HOUSING COSTS

Information on housing costs is only available at the countywide level which includes the Town of Mammoth Lakes. The following data are from the 2000 U.S. Census, Table DP-4, Profile of Selected Housing Characteristics.

Value (Owner-Occupied Units)

Less than $ 50,000	0.7 %
$ 50,000 to $ 99,999	4.7 %
$ 100,000 to $ 149,999	14.9 %
$ 150,000 to $ 199,999	19.6 %
$ 200,000 to $ 299,999	29.2 %
$ 300,000 to $ 499,999	21.4 %
$ 500,000 to $ 999,999	8.9 %
$ 1,000,000 or more	0.5 %
Median housing value	$ 236,300

Mortgage Status and Selected Monthly Owner Costs

With a Mortgage	79.4 %
Not mortgaged	20.6 %

Median monthly owner costs, mortgaged units	$ 1,462
Median monthly owner costs, non-mortgaged units	$ 366

Selected Monthly Owner Costs as a Percentage of Household Income in 1999

Less than 15.0 %	28.3 %
15.0 to 19.9 %	8.7 %
20.0 to 24.9 %	11.6 %
25.0 to 29.9 %	11.7 %
30.0 to 34.9 %	10.4 %
35.0 % or more	27.5 %
Not computed	1.8 %

Gross Rent

Less than $ 200	1.1 %
$ 200 to $ 299	1.1 %
$ 300 to $ 499	15.2 %
$ 500 to $ 749	39.2 %
$ 750 to $ 999	17.3 %
$ 1,000 to $ 1,499	7.5 %
$ 1,500 or more	2.7 %
No cash rent	15.9 %
Median rent	$ 682

Gross Rent as a Percentage of Household Income in 1999

Less than 15.0 %	15.7 %
15.0 to 19.9 %	13.2 %
20.0 to 24.9 %	11.8 %
25.0 to 29.9 %	9.1 %
30.0 to 34.9 %	4.3 %
35.0 % or more	29.8 %
Not computed	16.0 %

AFFORDABLE HOUSING

The need for affordable housing is increasing in June Lake. The limited availability of private land, the desire to maintain the area's single family residential character, and a housing market geared primarily to visitors and second-home owners leads to a lack of diversity in the housing stock and a lack of affordable housing for residents, including long-term rental units. June Lake Village contains the majority of the Loop's existing affordable housing stock. Mobilehomes and mixed use buildings with apartments over commercial establishments comprise most of the affordable housing. The Down Canyon area contains a few duplexes.

Overcrowding (generally defined as over 1.01 persons per room) and over-spending for housing result from shortages in affordable housing. Countywide, overcrowding does not seem to be a problem: 91.7 % of occupied housing units have 1.00 or less occupants per room, 3.9 % have 1.01 to 1.50 occupants per room, and 4.4 % have 1.51 or more occupants per room (2000 U.S. Census, Table DP-4).

Overspending for housing is defined as spending more than 30 percent of gross household income on housing. Countywide, 37.9 % of owner-occupied units spend 30 percent or more of household income on monthly housing costs; 34.1 % or renters spend 30 percent or more of household income on monthly gross rents (2000 U.S. Census, Table DP-4).

CHAPTER 7
TRANSPORTATION

OVERVIEW

Historically, residents and visitors of the June Lake area have depended on the automobile as their primary means of transportation. As the area grows, however, air quality, energy consumption, noise, traffic congestion and other automobile related impacts will increase. In order to avoid or reasonably lessen these impacts, a highly coordinated transportation system including street and highway improvements, bus transit, parking and non-motorized (paths, bikeways, and cross-country trails) transportation modes will be needed. Minimizing automobile usage in favor of a more non-motorized and mass transit oriented transportation system will greatly improve traffic circulation, avoid or effectively reduce growth anticipated impacts, and greatly enhance the Loop's destination resort character.

STATE ROADWAYS

Regional access to the June Lake Loop is provided by U.S. 395 and State Route (S.R) 158 (see Figure 7). U.S. 395 carries traffic to and from the metropolitan areas of Southern and Northern California, while S.R. 158 is a 15.8 mile loop road functionally classified as a major collector. All of U.S. 395 is four travel lanes between Big Pine and June Lake.

Ingress and egress to the June Lake Loop from U.S. 395 is via S.R. 158, also known as Boulder Drive. This 15.8 mile long two-lane highway extends westerly from its southern junction with U.S. 395, loops around and re-intersects with U.S. 395 approximately six (6) miles north of the south junction. The roadway allows for speeds of 35 to 45 mph, except in areas where traffic capacities are reduced because of minimal road width, lateral clearance, turning movements in intersections, on-street parking, pedestrian travel, cross traffic, sight distance and/or flooding.

A **Route Concept Report,** prepared for S.R. 158 by Caltrans District 9 Transportation Planning Branch in 1986, projects travel demand for a 20 year planning period, establishes level of service goals, and identifies the nature and extent of improvements needed to reach those goals. In the **Route Concept Report**, S.R. 158 is described in two segments. Segment I is from the South Junction with U.S. 395 to a point approximately 5.9 miles southwest (post mile 0.0 to 5.9). Segment II extends from post mile (P.M.) 5.9 to the northern junction with U.S. 395 at PM 15.8 (see Figure 8).

Six levels of service (LOS) have been selected to identify the conditions existing under various speed conditions on state highways. Table 5 describes these service classifications and some of their characteristics.

The existing level of service (LOS) for Segments I is D-35 mph; the existing LOS for Section II is C-40 mph. Average daily traffic volumes on S.R. 158 in 1990 and 1998, as collected by Caltrans at the June Lake and Grant Lake Junctions, are shown in Table 6. Between 1990 and 1998, traffic volumes at the June Lake Junction increased while traffic volumes at the Grant Lake Junction decreased.

Caltrans is in the process of updating the Route Concept Report for S.R. 158. In the existing Route Concept Route, future S.R. 158 traffic volume projections indicate that a 1.4 mile section will have exceeded threshold capacity by 1995, and that all of Segment I will have reached threshold capacity by 2005. In time, the current D-35 mph LOS will be downgraded to LOS E-25 to 30 mph.

Maintaining the current LOS (D-35) will require specific improvements between P.M. 0.8 to 2.2, 2.2 to 3.0 and 3.0 to 5.87. Post mile 0.8 to 2.2, (the section of S.R. 158 along June Lake) is on a steep side slope where little pad room exists for needed width expansion. Accidents are a concern from P.M. 2.15 to 3.04, (the June Lake central business district) where 82% of all accidents involve parked/parking vehicles. Accidents are also a concern from P.M. 3.04 to 5.87 where 67% of all accidents involve "ran-off-road" vehicles. The accidents occurring per million vehicle miles (MVM) on S.R. 158 between P.M. 2.15 and P.M. 5.87 exceed the threshold level for this type of facility. The Route Concept Report states that it will be extremely difficult to correct these deficiencies because of the numerous economic and environmental constraints inherent in each improvement project. Segment II (P.M. 5.9 to 15.8) is not projected to experience any capacity problems, consequently the C-40 mph LOS will apply for the 20 year planning period.

FIGURE 7
JUNE LAKE REGIONAL ACCESS MAP

FIGURE 8
STATE ROUTE 158

TABLE 5 LOS CLASSIFICATIONS AND CHARACTERISTICS

LOS A	A condition of free flow and low volumes with high speeds. Traffic density is low with speed controlled by driver desires, speed limits, and physical roadway conditions. There is little or no restriction in maneuverability due to the presence of other vehicles and little or no delay.
LOS B	Stable flow exists with operating speeds beginning to be restricted somewhat by traffic conditions. Drivers still have reasonable freedom to select their own speed and lane of operation. Reductions in speed are not unreasonable with low probability of traffic flow being restricted.
LOS C	Still a zone of stable flow, but speeds and maneuverability are more closely controlled by the higher volumes. Most of the drivers are restricted in their freedom to select their own speed, change lanes, or pass.
LOS D	Unstable traffic flow is approaching, with tolerable operating speeds being maintained though considerably affected by changes in operating conditions. Fluctuations in volume and temporary restrictions to flow may cause substantial drops in operating speeds.
LOS E	Operation is at lower operating speeds than in Level "D" with volumes at or near the capacity of the highway. Flow is unstable with speeds in the neighborhood of 30 mph. There may be stoppages of momentary duration.
LOS F	This is forced flow operation at low speeds where volumes are below capacity. These conditions usually result from vehicles backing up from downstream restrictions. Speeds are reduced substantially, and stoppages may occur for short or long periods of time because of downstream congestion.

TABLE 6
1990 & 1998 AVERAGE DAILY TRAFFIC (ADT) VOLUMES, S.R. 158

Route	Location	Peak Hour[a] 1990/1998	Peak Month[b] 1990/1998	Annual[c] 1990/1998
158	June Lake Junction 395	220/260	2,150/2,550	1,400/1,450
	Grant Lake Jct. 395	120/110	900/700	600/460

Table 13 Notes:

a. These are estimated figures.

b. The peak month ADT is the average daily traffic for the month of heaviest traffic flow.

c. Annual average daily traffic is the total traffic volume for the year divided by 365 days. Some routes are regularly closed for one month or more during the winter; ADT figures for those routes reflects travel when the route is open. Routes regularly closed during the winter include S.R. 158, June Lake Loop, Powerhouse to north Jct. U.S. 395, 8.6 miles.

SOURCE: Caltrans 1990 and 1998 Traffic Volumes on California State Highways.

Winter access to the June Lake Loop on S.R. 158 is constrained by snowfall. During the late fall, winter and early spring, Caltrans removes snow and otherwise maintains S.R. 158 from its South Junction (P.M. 0.00) to the Rush Creek Hydroelectric Plant (powerhouse) near Silver Lake (P.M. 5.87). The remaining 9.9 miles, from the powerhouse to the north junction, are not plowed due to avalanche conditions that prevail for approximately four and one-half months each winter season. When this section is officially closed all traffic must enter and exit June Lake via the South Junction. The terrain bordering S.R. 158 between the Oh! Ridge turnoff and the Village contains two avalanche chutes that have historically produced severe snow slides. Consequently, the route is subject to closure during periods of imminent avalanche danger or following slides that physically block the road.

Current avalanche control along S.R. 158 consists of monitoring and scheduled shooting of the avalanche zones (P.M. 1.1 to 2.1) with a strategically placed recoilless rifle located on the northwest side of June Lake. When possible, these shootings are scheduled during non-peak traffic periods to minimize road closures.

The completion of North Shore Drive provided an alternative access route into June Lake during the winter months, minimizing impacts to the community caused by avalanche closures of S.R. 158.

COUNTY ROADS

There are currently 12.69 miles of county-maintained roads in the June Lake Loop, 10.19 miles of which are paved (Table 7). Most of the paved road sections are located in the immediate vicinity of the June Lake Village and provide circulation between residential, commercial and recreation centers. The entire system consists of two-lane roads, many of which exhibit minimal width and shoulder area as well as questionable structural integrity (Figures 9 A-D). Past studies indicate that this road network does not provide adequate circulation for local traffic.

Road surface and shoulder repair, signing and striping and snow removal, as well as minor and major improvements such as road surfacing and alignment improvements, are currently provided by the Mono County Public Works Department. Operating revenues that support these services are provided through various state and federal revenue generating programs.

Financial constraints have forced Mono County into a difficult position regarding the acceptance of roadways into the County maintenance program. The County Public Works Director has indicated that new and/or existing roads constructed to applicable county road standards may or may not be accepted into the County's road maintenance system. The amount of state and federal subsidies available to the County has been decreasing both in current and constant dollars. Unless additional monies become available for road maintenance, the acceptance of new roads into the County's road maintenance system could adversely impact the level of maintenance provided on other county roads.

TABLE 7
COUNTY ROADS, FUNCTIONAL CLASSIFICATIONS AND STATISTICS

ROAD NAME	LENGTH IN MILES	PAVED MILES	USFS MILES	FUNCTIONAL CLASSIFICATION
Alderman Street	.08	.08		Residential
Aspen Road	.22	.22		Collector
Big Rock Road	.12	.12	.12	Residential
Brenner Street	.10	.10	.05	Minor Arterial
Bruce Street	.22	.22		Minor Arterial
Crawford Avenue	.29	.29		Collector
Dream Mountain Dr	.21	.21		Rural
Forest Road	.40	.40	.40	Residential
Foster Avenue	.12	.12		Minor Arterial
Garbage Pit Road	1.11	1.11	1.11	Residential
Granite Avenue	.22	.22	.11	Residential
Grant Lake Road	.2	.2	.2	Residential
Gull Lake Road	.15	.15		Rural
Gull Lake Camp-ground Road	.38	.38	.22	Rural
Highland Drive	.06	.06		Residential
Howard Avenue	.07	.07	.04	Residential
June Lake Beach Rd.	.95	.95	.95	Residential
Knoll Avenue	.18	.18		Minor Arterial
Lakeview Drive	.29	.29		Residential
Leonard Avenue	.55	.55	.49	Minor Arterial
Lyle Terrace Road	.32	.06	.32	Residential
Mountain Vista Dr.	.12	.12		Residential
Northshore Drive	3.57	3.57		Minor Arterial
Parker Lake Road	2.67	.43	1.75	Rural
School Road	.09	.09	.09	Rural
TOTALS	12.69	6.03	5.94	

Sources: Mono County Road Department. Nichols Consulting Engineers.

FIGURE 9 A
PINE CLIFF ROADS

FIGURE 9 B
JUNE LAKE VILLAGE ROADS

FIGURE 9 C
WEST VILLAGE/RODEO GROUNDS ROADS

FIGURE 9 D
DOWN CANYON ROADS

PAVEMENT MANAGEMENT

Mono County is responsible for the repair and maintenance of local roads within the June Lake area. Studies done for local roads (see Nichols Consulting Engineers) developed the pavement condition index, or PCI, for local roads. The PCI is a measurement of pavement grade or condition and ranges from 0 to 100; a newly constructed road would have a PCI of 100, a failed road would have a PCI of 10 or less. A PCI range of 70 to 100 is considered good condition, 50-69 is fair condition, 25-49 is poor condition, and 25 or less is very poor condition. Fifty-two percent of June Lake roadways had a PCI of 70-100 (good condition). The remaining 48 percent of June Lake roadways had a PCI of 50-69 (fair condition).

The Pavement Management System report developed by Nichols Consulting Engineers recommends that Mono County increase the funding for street maintenance in order to significantly improve the average PCI over the next five years. A much improved roadway system would be easier to maintain over the long term and would result in fewer complaints and more cost-effective expenditures of maintenance funds (Nichols, p. 20).

NON-COUNTY PUBLIC AND PRIVATE ROADS

The majority of non-county public and private roads exist in the Down Çanyon area (Figure 9 D). Included in this category are all roads within the Peterson and Clark Tract Subdivisions (Silver Lake Pines Tracts 2, 4, and 5), the Silver Lake Forest Service Tract, and portions of the road systems within the Williams Tract subdivisions, Silver Lake Pines Tract 1 and June and Gull Lake Forest Service Tracts .

Many of the non-county public and private roads were developed under dated subdivision requirements and not designed for future circulation needs. The stated intent of the Silver Lake Pines Tracts was to offer lots for tent sites that would allow visitors to enjoy many summer recreational benefits. Based on this philosophy, the Silver Lake Pines Tracts were plotted with lot sizes of 25' X 100', 40' X 80' and 50' X 100'. All streets throughout the tracts were established at 25 feet in width, which was considered sufficient to allow each property owner access to his individual lot. To further complicate matters, the tracts were plotted in typical oblong lots and blocks without regard to topography. Many of the alignments for the legal subdivision "paper roads" were therefore impossible to follow because of the constraining terrain such as stream beds, rock outcroppings and slopes in excess of 60%. As a consequence, the majority of existing county and privately maintained roads were constructed without adequate consideration given to surfacing, width, shoulder area and drainage facilities.

In 1981, the Mono County Public Works Department recognized the Loop's existing constraints to roadway construction and developed a special set of arterial/commercial and collector/residential road standards tailored to meet those constraints (Figures 10 and 11). These standards permit lower design speeds and narrower roads than in other areas of the county.

Major development projects have been able to comply with these standards, however the costs of upgrading the area's older roads will continue to preclude their improvement and ultimate acceptance into the County maintenance program. Additionally, owners of properties served by these roads will continue to bear all maintenance related expenses as public and private non-county road systems do not qualify for state and federal maintenance funding.

FIGURE 10
ARTERIAL/COMMERCIAL STANDARDS

FIGURE 11
COLLECTOR/RESIDENTIAL ROAD STANDARDS

NEED FOR ROAD IMPROVEMENTS

Travel within the June Lake Loop is predominantly by car. Dependency on this mode of transportation often results in peak traffic volumes that exceed state and county road system design standards. Traffic volumes of the magnitude experienced on peak use days were not anticipated when much of the road system was originally developed and, as a consequence, congestion and other circulation related problems have grown beyond acceptable and desirable levels.

The Loop road system adequately serves the transportation needs of area residents and visitors on most weekdays. However, peak weekend and holiday traffic volumes can exceed the system's capacity. Of particular concern are the two major traffic flow periods associated with winter recreation activities at June Mountain Ski Area. The first results from regional traffic that arrives on Friday nights and departs on Sunday afternoons. Regional travel is oriented to and from the south on U.S. 395, with peaks occurring in June Lake at approximately 10 p.m. and 4 p.m. respectively. The second and more significant peak period occurs during relatively short time intervals in the morning (between 8 a.m. and 9:30 a.m.), afternoon (between 12 p.m. and 1 p.m.) and evening (between 4 p.m. and 5 p.m.) and is directly related to local and intercity travel between the ski area and lodging facilities. During the morning and afternoon periods, traffic originating from the Village, West Village, Mammoth Lakes, Lee Vining and other outlying locations converges in the central business corridor. Congestion and traffic safety concerns resulting from inadequate turning features at the Knoll Avenue and Gull Lake Drive intersections, on-street parking and auto/pedestrian conflicts are especially significant along this 0.2 mile, two-lane section of S.R. 158 and the County collector roads which feed into it. The same conditions prevail to a greater extent during the evening rush hour period when traffic departs the ski area enroute to local and out-of-the-area lodging accommodations.

TRANSIT SERVICE

The following transit services are currently available in Mono County:

Inter-Regional Transit
Inyo-Mono Transit, in cooperation with Kern Regional Transit, operates the rural intercity CREST route (Carson City, Ridgecrest, Eastern Sierra Transit). The CREST route connects with the Pride transit service in Nevada and with Kern Regional Transit services in Kern County. The CREST route allows riders to travel north to Carson City and south to Mojave where they can obtain transportation to other destinations from other transit providers. The CREST route operates one round trip between Bishop and Carson City per day (see Appendix A, June Lake Map Set).

Non-scheduled regional and inter-regional transit service is also offered by private charter lines, with the majority typically originating from Southern California, and less frequently from the Bay Area and Los Vegas. The majority of charter buses stop in Mammoth Lakes. According to the Mammoth Lakes Visitor Bureau, approximately 20 to 30 buses per day serve Mammoth Lakes in the summer months, and approximately 10 to 15 buses per day in the winter months.

Countywide Public Transit/Inyo-Mono Transit
Inyo-Mono Transit provides transit services throughout the county and to Bishop and Carson City. It provides scheduled and demand-responsive services for senior citizens, handicapped persons, low-mobility persons, and the general public.

Yosemite Area Regional Transportation System (YARTS)
A two-year demonstration project to provide a "positive alternative choice for access to (Yosemite National Park) for visitors, employees, and residents began in May, 2000 (for further information see www.yosemite.com). Service will be provided to and from Lee Vining in Mono County (and locations in Mariposa and Merced Counties) on a schedule that connects with the Yosemite National Park shuttle service. Bus shelters will be provided at two locations in Lee Vining; bus signs will be provided at two additional locations in Lee Vining.

Lodging-based Shuttles
This service is provided by condominiums and hotels in Mammoth Lakes and June Lake. These shuttles provide on demand service to the Mammoth Yosemite Airport and to the ski areas for lodging guests.

June Mountain Ski Area
The ski area provides scheduled employee shuttle service between Bishop, Mammoth and June Lake. Ridership is restricted to ski area employees living in Bishop.

Inyo Mono Area Agency on Aging
IMAAA serves the transportation needs of senior citizens. The Agency takes seniors shopping, to the doctor, or to obtain other services, locally or long distance. Senior trips go to destinations such as AARP conventions, Reno, or Los Angeles. IMAAA runs a meals-on-wheels program and helps distribute government surplus food throughout the County.

School Buses
The county's dispersed population and the location of its public schools require some students to travel many miles to and from school. Both the Eastern Sierra Unified School District and the Mammoth Lakes School District provide bus services for their students.

PARKING

The two areas exhibiting the greatest parking deficiencies are S.R. 158 in the central business corridor and S.R. 158 near June Mountain Ski Area. These deficiencies are most apparent during relatively short intervals on major weekend, holiday and special event periods when automobile traffic volumes and associated commercial and recreational parking demands are greatest.

Central Business District
Customer parking in and adjacent to the Village's Central Business District is limited. The majority of structures within the business corridor are used as shops, stores, restaurants and/or for government services. Many of the structures were developed prior to the adoption of county ordinances requiring adequate on-site parking facilities. While more recent developments have been able to comply with these requirements, (about 162 off-street customer, employee and/or resident lot spaces are currently provided), other older establishments have not and cannot because of restricted land availability and other geographic constraints.

The owners, renters and lessors of these properties share 70 on-street spaces provided on either side of S.R. 158 between the north and south Lakeview Drive intersections. Customers often find it inconvenient to patronize these businesses especially during peak morning, afternoon and evening winter rush hour periods when parking and traffic congestion are most severe. The on-

street parking problem is further aggravated when parking spaces in the immediate vicinity of these establishments are taken by customers patronizing businesses which provide adequate off-street lot parking. Operations of snow removal equipment during business hours by Caltrans and other snow removal techniques as practiced by certain property owners along the corridor also contribute to the overall problem. As discussed in the **District 9 Route Concept Report,** accidents are also a concern along the corridor where 82 percent of all accidents involve parked/parking vehicles.

Improving traffic flow through the central business corridor during peak volume periods may require developing and implementing a special on-street parking restriction program. While the prohibition of parking on S.R. 158 would benefit traffic flow and improve safety, such an action would likely be unacceptable to adjacent businesses that lack adequate off-street parking facilities.

The construction of public parking lots in the Village commercial core, in addition to on-street parking restrictions, may reduce traffic problems. Public parking may be necessary as development in the Village commercial core continues. Narrow roads (25' right-of-way) and small parcels in the Village will preclude the provision of parking facilities at or adjacent to new development. Off-site public parking facilities may be needed to fill this void. Besides improving traffic flow and safety, public parking lots may provide the first step in developing a pedestrian-oriented Village.

June Mountain Ski Area

The USFS indicates that parking facilities at June Mountain Ski Area must be increased from the existing 750 spaces to 941 spaces in order to accommodate the planned expansion in skier capacity from 2,250 skiers at one time (SAOT) to 3,900 SAOT. This increase will provide parking to accommodate 84 percent of skier vehicles arriving on a maximum use day. This suggests that 3,260 skiers will access the ski area by private automobile, recreational vehicle or tour bus with the balance (640 skiers) arriving by local transit or other modes of public transportation, none of which is currently available. Parking demands exceeding the available 750 spaces have occurred on numerous occasions in the past. On these days, customers unable to find lot parking must park along the road shoulder of S.R. 158. Traffic congestion and safety hazards are significant during these events.

NON-MOTORIZED TRANSPORTATION FACILITIES

Except for a few US Forest Service designated and maintained trails, formal transportation facilities to accommodate the needs and desires of walkers, hikers, bicyclists and cross-country skiers have yet to be developed within the June Lake Loop.

Summer bicycle and pedestrian traffic along existing roadways has increased in recent years. Residents and visitors who prefer this form of transportation currently travel on roadways that lack adequate safety features. Safety hazards are also evident during or following heavy winter snow storms when pedestrians find travel along plowed road sections more convenient than unmaintained or poorly developed walkways. These conditions are especially noticeable within the Village.

The types of bicycle, hiking and cross-country skiing facilities that residents and visitors would like to see developed in the June Lake area fall into three general categories: 1) safe routes for sightseeing, recreational exercise, transportation to and from places of employment, commercial areas, camping and day use picnic sites and recreation centers; 2) safe routes for children

commuting between neighborhood, commercial and recreation centers; and 3) safe routes for use by long distance bicycle riders and organized athletic event participants.

Besides the recreational benefits, developing a comprehensive trail system would also serve to reduce traffic congestion by: 1) providing an alternative to automobile use; and 2) relieving existing pedestrian/bicycle/automobile safety conflicts.

The June Lake Area Plan, the Mono County Trails Plan, and the June Lake Multimodal Plan in the Mono County Regional Transportation Plan (RTP), contain policies that stress the need to develop a trail system linking commercial, residential, recreational, and parking nodes in the June Lake Loop. The US Forest Service has also identified specific routes for bike paths in the Loop.

The USFS bicycle path proposals are primarily Class I paths or paths physically separated from streets or highways. The proposed state and county bike paths are primarily Class II paths, bicycle lanes established along existing streets. Table 8 presents a more complete description of bicycle paths.

TABLE 8 BICYCLE PATH CLASSIFICATIONS

Class I: Bicycle paths which serve corridors not served by streets and highways and which offer opportunities not offered by the road system. Such paths can either provide for a unique recreational experience or serve as direct high-speed commute routes with minimal cross-flow of vehicles. The most common applications are along rivers, canals, utility rights-of-way, abandoned roadways or within or between parks. These facilities are often provided as part of planned developments.

Class II: Bicycle lanes established along streets where significant bicycle demand and distinct needs exist. Such lanes improve conditions for bicyclists in the designated corridors by providing for more predictable movements to bicyclists and motorists. An important function of Class II lanes is to better accommodate bicyclists along corridors where insufficient room exists. This is done by widening shoulders and/or prohibiting parking on given streets in order to delineate bicycle lanes.

Class III: Bicycle lanes similar to Class II facilities except that the shoulder area is shared with parked vehicles. These lanes should only be designated where no convenient alternative route exists and where necessary for route continuity. Implementation of a definitive non-motorized transportation plan would assure the development of a more pedestrian, bicycle and cross-country skiing oriented community.

Source: USFS.

AVIATION

Aviation facilities are available at Lee Vining Airport, located approximately 15 miles north of June Lake, and at Mammoth Yosemite Airport, located approximately 20 miles south of June Lake.

Lee Vining Airport is a small, general aviation facility. Aviation facilities include the airfield area (one paved runway and approaches) and the terminal area (3 privately owned hangars, a 90' x 300' asphalt aircraft parking apron accommodating 7 tiedown spaces, a runway/apron taxiway, and a short paved access road connecting the gravel entrance road with the apron). The airport currently serves single and twin-engine aircraft, as well as occasional turboprops. There is no scheduled commercial service and no plans for such service in the future.

Mammoth Yosemite Airport currently serves predominantly general aviation aircraft. The Mammoth Yosemite Airport Expansion Project allow for the expansion of airport facilities so the airport can operate as an air carrier airport with commercial air carrier and commuter service to regional and national destinations.

MEDICAL TRANSPORTATION

Paramedic/rescue service for June Lake and the surrounding area is provided by Mono County under the direction and supervision of the Mammoth Lakes Fire Protection District Fire Chief. Base station facilities are located at the June Lake Fire Station where a winterized mobile intensive care unit is manned on a 24 hour/day basis by a two man trained paramedic team. Mobile units respond to general emergency and mutual aid calls generally within one minute from the time the call is received. Travel time to emergency sites varies depending on distance, weather conditions and other related factors.

Medical air transport is also available in Mono County through Mammoth Community Hospital in Mammoth Lakes.

CHAPTER 8
VISUAL RESOURCES

VISUAL ENVIRONMENT

NATURAL ENVIRONMENT

The visual and aesthetic splendor of the June Lake planning area is one of its most valuable and obvious assets. The Loop derives its visual character from unique geologic formations, clean, clear lakes and streams, diverse vegetative types, contrasting land forms, abundant and varied wildlife, and seasonal variation in climatic conditions.

Residents, recreational visitors, and tourists are drawn to the area by its magnificent scenery. Snowcapped, barren peaks reaching heights in excess of 12,000 feet rise as escarpments along the south, southeast and southwest edges of the Loop. Springs and streams originate as snowmelt and cascade down the canyon walls to join a string of four beautiful lakes and interconnecting creeks. Well-defined and highly visible corridors of riparian vegetation border these water bodies. Adjoining the riparian areas, in flat, poorly drained sites, are highly sensitive wetlands, primarily of the marsh, wet meadow and riparian woodland types. The plant, animal and water components that make up the wetland communities offer a wealth of color, texture and sound. Drier areas in the north and northwest portions of the Loop provide visual contrast to the riparian and wetland land areas. Wide uninterrupted expanses of sagebrush and bitterbrush marked with occasional patches of Jeffrey Pine coexist in flat to gently rolling terrain. At higher elevations, the Juniper-Pine-Shrub plant community, characterized by a mosaic of plant shapes and forms set against the steep, rocky canyon walls, eventually displaces the Jeffrey Pine community.

In addition to the sensitive visual resources contained in the planning area, adjacent visually sensitive areas include the Mono Basin National Forest Scenic Area on the planning area's northeast boundary and the Ansel Adams Wilderness on the western boundary. Visual quality objectives in the Mono Basin Scenic Area are either retention or partial retention while lands contained in wilderness areas are managed under the preservation objective.

Visually sensitive natural landmarks contained in the June Lake Loop or visible from the canyon floor were identified by the June Lake Citizens Advisory Committee in the 1986 **June Lake Imageability Study.** Landmarks were divided into major and minor classifications. Major landmarks included June, Gull, Silver and Grant Lakes, Carson Peak, Horsetail Falls and the balancing rock at the entrance to the June Lake Village.

BUILT ENVIRONMENT

The June Lake Area Plan notes that:

> "According to the June Lake Visitor Sample (1986), visitors are attracted to the Loop for its natural, not built, environment. Recent studies have found that June Lake's built environment lacks aesthetic elements and strongly relies on the area's natural features for visual distinction. Furthermore, the studies revealed that the built environment actually

detracts from the natural environment. The absence of major year-round nodes, distinct landmarks, and strong relationships among the town's visual elements were cited as common factors."

The historic development of the June Lake Loop, with its unplanned land uses, building designs, utility structures, and circulation patterns, is often in direct contrast with the surrounding natural environment. Against this natural backdrop, many of the atypical shapes, textures and colors of structures and roadways, above ground powerlines and other structures are easily discernible, sometimes from great distances. During the day, sunlight reflects from metal and glass surfaces, while at night, lights within the community isolate the urban areas from the uninterrupted darkness of the natural areas surrounding it.

June Lake, as characterized by visitors in the **1986 Visitor's Study,** is described as an alpine village nestled high in the Sierra Nevada Mountains. This popular observation stems primarily from the architectural flavor exhibited by a number of roadside frontages along the 0.3 mile section of the June Lake Village. West of the Village, in the largely residential Down Canyon area, pockets of more contemporary developments are found. With the exception of commercial uses fronting S.R. 158, most development in Down Canyon is concealed by roadside vegetation and topographic features.

Workshops conducted during the planning process for the June Lake Community Design Guidelines identified aspects of the built environment that people liked:

- the intimate scale of the Village with buildings close to the streets;
- the human scale of development; and
- the rural aspect of the Loop with varied setbacks in Down Canyon and treed yards.

Participants in the workshops also identified significant views and vistas, significant landmarks, and significant open spaces within the June Lake Loop:

Significant Views and Vistas

Significant Landmarks

Significant Open Spaces

SCENIC HIGHWAYS

U.S. 395 is a state-designated scenic highway throughout the June Lake planning area (see Appendix A, June Lake Map Set). S.R. 158 is a county-designated scenic highway. Scenic highways are subject to Mono County General Plan policies (Conservation/Open Space Element, Visual Resource policies) and to the requirements of the Scenic Combining District in the county's Land Development Regulations, both of which restrict the type of development that can occur in the scenic highway corridor.

Federally designated Scenic Byways in Mono County include the Eastern Sierra Scenic Byway project, which encompasses Hwy. 120 in Lee Vining Canyon and Hwy. 395 from the Nevada state line in Mono County to southern Inyo County. Federal funds have been used to provide enhancement projects such as scenic byway kiosks, scenic vista points, and rest areas along the Eastern Sierra Scenic Byway.

Information and maps about the Eastern Sierra Scenic Byway are available at www.395.com/scenicbyway/ (see also Figure 12 and Appendix A). There are two Eastern Sierra Scenic Byway turnouts located in the June Lake planning area (see Figure 5). Site # 7, "Glaciers and Volcanoes", is south of the junction of Hwy. 395 and Hwy. 120 East and includes a kiosk and interpretive displays. Site # 8, "Scenic June Lake", is located at the June Lake Junction and also includes a kiosk and interpretive displays.

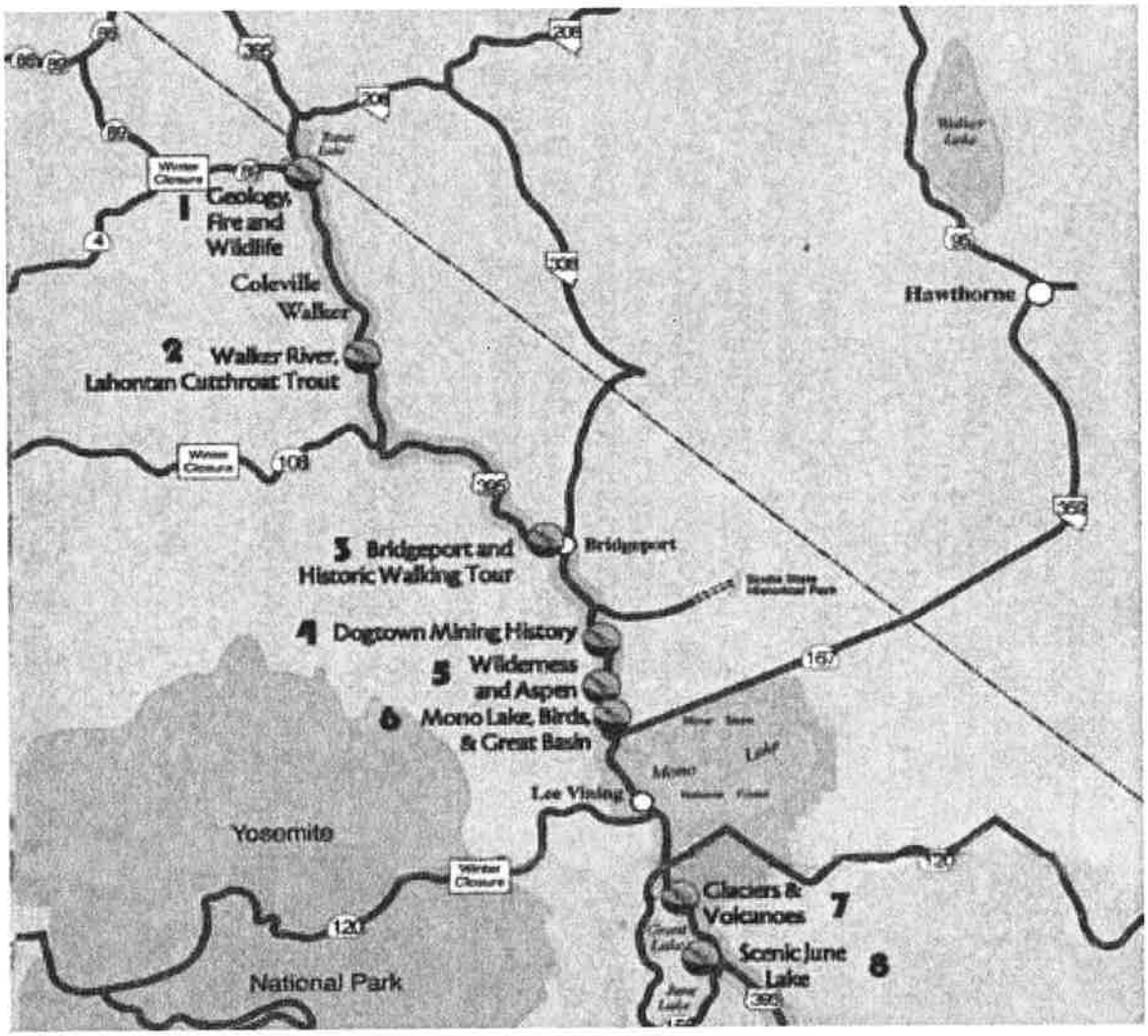

Figure 5 Eastern Sierra Scenic Byway Map--Mono Basin

Source: www.395.com/scenicbyway/

VISUAL MANAGEMENT SYSTEMS

PUBLIC LANDS

The U.S. Forest Service manages the visual resources of national forest lands in the June Lake Loop according to the Visual Management System. This system establishes a Visual Quality Inventory based on a combination of scenic quality (Variety Class), the viewer's concern for scenic quality (Sensitivity Level), and the distance from the view point to the object (Distance Zones). The inventory, based on a combination of the above factors, describes the levels of acceptable alteration that can occur without harming the resource. These Visual Quality Objectives as defined as follows:

Preservation (P) - Allows only ecological changes on the land and restricts uses to only very low visual impact recreational facilities.

Retention (R) - Allows management activities that repeat characteristics already found in the natural landscape.

Partial Retention (PR) - Allows management activities that repeat characteristics already found in the natural landscape and other changes provided that the visual impact is dominated by the natural environment.

Modification (M) - Allows management activities that may visually dominate the natural characteristics of environment but also borrow some of its features.

Maximum Modification MM - Allows management activities that disturb vegetation and landforms to dominate the natural characteristics of the environment.

In evaluating the potential visual impacts of a project, the Forest Service also defines an area's Visual Absorption Capacity (VAC), the area's ability to absorb modification while retaining its visual character. The slope, the distance zone, and the screening ability of on-site vegetation contribute to an area's VAC. Low VAC areas are areas where development would be highly visible; high VAC areas are areas where development would be less visible or not visible at all.

The Bureau of Land Management (BLM) uses a similar system to inventory visual resources on the public lands it manages. The BLM's Visual Resource Management System uses visual contrast, the difference between the existing setting and proposed uses, to assess potential impacts and management alternatives. The classes are presented as follows:

Class I - Very High - Visual contrast is prohibited. No changes will be allowed to alter the existing basic visual elements.

Class II - High - Visual contrast is permitted. Changes that will not be visible in the characteristic landscape are allowed.

Class III - Moderate - Visual contrast that remains subordinate to the characteristic environment is permitted.

Class IV - Low - Visual contrast caused by a management activity may attract attention and represent a dominant feature, however, it must conform to the basic elements of the environment.

Figure 13 shows the Visual Resource Designations for public lands in and adjacent to the June Lake Loop planning area.

VISUAL RESOURCE POLICIES & REGULATIONS

Mono County General Plan

The Mono County General Plan, Conservation/Open Space Element, contains a Visual Resource policy section that addresses general design guidelines for development throughout the county, the protection of scenic highway resources, reclamation of visually disturbed areas, the placement of overhead utilities, and other visual resource issues. The goal of the visual resource policy section is to "Protect and enhance the visual resources and landscapes of Mono County."

Mono County Land Development Regulations

The Mono County Land Development Regulations contain a number of provisions that address various aspects of the visual environment. Provisions for height limitations, parking, sign standards, utilities placement, stream setbacks, landscaping, density, and yard setbacks all affect the visual environment. In addition, the Scenic Combining District is intended to:

> "regulate development activity in scenic areas outside of communities in order to minimize potential visual impacts. Use of the S-C district is encouraged in areas adjacent to and visible from designated scenic highways as well as in other important scenic areas."

June Lake Area Plan

The June Lake Area Plan contains policies that support the community's vision for the future development of the Loop. Many of the goals and key land use concepts contained in the Plan focus on visual resource issues. To achieve the overall community vision that "June Lake ultimately develops into a moderately sized, self-contained, year-round community", land use goals focus on containing growth is and around existing developed areas, conserving June Lake's mountain village and rural character, and emphasizing the visual predominance of the natural environment.

June Lake Community Design Guidelines

The June Lake Community Design Guidelines support existing land use policies for June Lake and are intended to communicate the community's expectation for quality development. The guidelines are to be used in conjunction with the Mono County General Plan and the June Lake Area Plan. The Guidelines are intended to provide a framework for future development as well as clearly defining the visual character of the area.

The Guidelines address three types of development within the Loop: Community Structure, Commercial Core, and Neighborhood/Resort Design.

> **Community Structure**: New development will be designed to visually link the existing neighborhoods of June Lake. The June Lake Loop is made up of the existing Village area and Down Canyon with new areas developing in between. The Rodeo Grounds and Highlands neighborhoods have the potential to link the community visually. Landmarks, views and vistas were identified as significant issues of the community. The Guidelines address these issues as well as the street network, parks, open spaces, lakefronts and trails.

Community Core: This section focuses on the "main street" of the Village and the creation of pedestrian-scaled streets and amenities. Community gateway, building design and signage guidelines are used to illustrate the development potential for the Village.

Neighborhood/Resort Design: This section highlights guidelines for residential design, the Rodeo Grounds, streetscapes and housing options for residents.

FIGURE 13
VISUAL RESOURCE DESIGNATIONS

CHAPTER 9
OUTDOOR RECREATION

OVERVIEW

The June Lake area receives extremely heavy recreational use, primarily during the summer months when trout fishing, camping, hiking, biking and sightseeing are the primary activities. During the winter, downhill skiing at June Mountain, cross-country skiing, and snowmobiling are popular activities.

DEVELOPED RECREATIONAL FACILITIES

Developed recreational facilities include June Mountain Ski Area, campgrounds operated by the US Forest Service and concessionaires at Oh! Ridge, Pine Cliff Trailer Park, June Lake, Gull Lake, Reversed Creek, Silver Lake, and Grant Lake, county-operated park facilities, and private resorts and marinas located throughout the Loop.

The June Lake Loop has two community parks, one adjacent to the June Lake Community Center near Gull Lake and the June Lake Ballfield, located northwest of the West Village area. Park facilities at the June Lake Community Park adjacent to Gull Lake are limited to a few picnic tables, swing sets, slides, a single tennis court, one basketball backboard and court located in the Community Center parking lot and a public restroom facility.

The June Lake Ballfield is located on five acres of public lands under special use permit to Mono County from the Inyo National Forest. Park facilities include a regulation baseball field with backstop, dugouts and bleachers, portable restrooms, a gravel parking area and a gravel access road. Future plans for the site include another baseball field or soccer filed, picnic facilities and BBQ sites, landscaping, permanent restrooms, walking trails, biking trails, and kids play area.

DISPERSED RECREATIONAL ACTIVITIES

Dispersed recreational activities occurring on public lands in and around the June Lake Loop include biking, hiking, camping, fishing, cross-country skiing, snowmobiling, and sightseeing. Trails in the area, including scenic highways, provide opportunities for many of these activities.

U.S. 395 is a state-designated scenic highway throughout the June Lake planning area (see Appendix A, June Lake Map Set). S.R. 158 is a county-designated scenic highway. Federally designated Scenic Byways in Mono County include the Eastern Sierra Scenic Byway project, which encompasses Hwy. 120 in Lee Vining Canyon and Hwy. 395 from the Nevada state line in Mono County to southern Inyo County. Federal funds have been used to provide enhancement projects such as scenic byway kiosks, scenic vista points, and rest areas along the Eastern Sierra Scenic Byway.

There are two Eastern Sierra Scenic Byway turnouts located in the June Lake planning area. Site # 7, "Glaciers and Volcanoes", is south of the junction of Hwy. 395 and Hwy. 120 East and

includes a kiosk and interpretive displays. Site # 8, "Scenic June Lake", is located at the June Lake Junction and also includes a kiosk and interpretive displays.

CHAPTER 10
CULTURAL RESOURCES

CULTURAL RESOURCES

The June Lake area has a rich and varied cultural resource history. Several Paiute tribes were known to have seasonally inhabitated the area. White settlers, primarily involved with prospecting and mining minerals, began moving into the area in the mid- to late-1800s. These settlers were followed by others involved in support-oriented activities such as ranching, hydroelectric power generation, water export, and transportation. The recreational component of the economy began evolving around the early 1900s and has continued growing to this date.

PREHISTORIC RESOURCES

Current research indicates that eastern California and western Nevada have been occupied for at least the past 10,000 years. The most recent prehistoric residents and users of the area include the Owens Valley Paiute, the Northern Paiute, Miwok, and Washoe. Descendents of these people still live in the Great Basin and on the western slope of the Sierra Nevada.

Ethnography

Available linguistic data indicate two language families and several dialect communities in the general vicinity of the June Lake Loop at the time of Euroamerican contact. Penutian-speaking central and southern Sierra Miwok inhabited the area west of the Mono Basin and the crest of the Sierra Nevada. Numic-speaking western Sierra Mono inhabited the upper western Sierra slopes west of the Owens and Long Valleys. Land immediately east of the Sierra was occupied by at least three distinct, Numic-speaking northern Paiute groups: the Owens Valley Paiute, the Mono Lake Paiute and the Walker Lake Paiute.

The ethnographic inhabitants of the Mono Basin, the Mono Lake or Kuzedika Paiute, were divided into several bands totaling between 200 and 300 persons. The Mono Lake Paiute were organized around the nuclear family, with perhaps one or two additional relatives completing the households. Each "kin clique" was isolated for much of the year and determined its own schedule of seasonal activities and movements in order to deal with widely dispersed and seasonally limited resources. During the winter, individual kin cliques gathered in multiple family villages. Communal events such as game drives and festivals were used as times to engage in a wide range of social, political and economic transactions.

Traditional Paiute subsistence activities focused on the seasonal distribution of plants and animals used for food and raw materials. For the Kuzedika Paiute, spring was spent at temporary camps in riparian areas of the mountains canyons of the Sierra Nevada and Bodie Hills, where early green bulbs and shoots were gathered. In early summer, the Kuzedika Paiute moved to meadow camps at the foot of the Sierra Nevada and Bodie Hills, where seeds and bulbs were harvested. Piuga (larvae of the Coloradia pandora moth) from the Jeffrey Pine forest south of Mono Lake and Koo-chah-bee (brine fly larvae, Ephydra spp.) from the shores of Mono Lake were collected during the summer. In fall, pinyon pine nuts were gathered. Winter was spent at pinyon camps on the east side of Mono Lake or at meadow camps if the pinyon crop was poor. Major game such as deer and mountain sheep were hunted throughout most of the year,

sometimes being ambushed from brush or stone blinds erected along game trails and creeks or near springs. Food stores accumulated over the summer and fall supplied most of the meals in the winter, a season in which there was much socializing, planning and probably a good deal of craftwork.

The Kuzedika Paiutes traded salt, pinyon pine nuts, piuya, brine fly larvae, finished points, sinew backed bows, buffalo hides, rabbitskin blankets, baskets, pumice stone and red and white pigments to neighboring groups in exchange for shell money, acorns, baskets, arrows, a fungus used in paints, manzanita berries, elderberries and squawberries. There is abundant evidence of local and trans-sierran trade between Kuzedika Paiute and Sierra Miwok. Sierra Miwok served as intermediaries in trade with Yokut and Plains Miwok. This trade activity is confirmed by evidence of obsidian biface production at several of the studies sites in the region and abundant obsidian from the eastern Sierra which has been found west of the Sierra Nevada range. Obsidian sources included those at Mono Craters, Bodie Hills, Glass Mountain, Casa Diablo and Mount Hicks.

Material Remains

Material remains at prehistoric archaeological locations in the region are characterized by a diverse assemblage of artifacts, structural features and occasionally, organic refuse. Common archaeological finds include flaked stone projectiles and tools, rock and wood food processing instruments, clay or ceramic storage and cooking containers, and primitive structural remains. Recognized categories of flaked stone tools include projectile points, bifaces, blanks, unifaces, cores, drills and occasional flake tools. Sharp-edged, bifacially flaked projectile points were lashed to the foreshaft or mainstays of arrows, atlatl darts and spears. Aside from their use in hunting activities, projectile points probably underwent incidental use as fine cutting tools. Stone unifaces and bifaces were used in a variety of cutting, scraping and stripping tasks. Blanks represent early and intermediate stages in the manufacture of points and bifaces. Cores were natural cobbles or chunks of rock struck repeatedly with a hammer of stone, wood or bone to produce a usable tool. Drills were used to punch or bore holes in skins, wood, bone, horn or imported shell and steatite. Flaked stone debris, consisting of the by-products of core reduction, tool manufacture and tool repair, was a primary source of casual flake tools and is by far the most frequently encountered class of archaeological debris in the eastern Sierra.

Ground stone tools found at many archaeological sites in the region include milling slabs, handstones, mortars and pestles. Handstones and milling stabs were presumably used in combination to grind seeds and pine nuts. Bedrock mortars common near the crest of the central Sierra were usually deep, steep walled depressions in which vegetable matter was pounded or crushed with a stone or wood pestle. A final class of debris likely to be preserved at some prehistoric sites is pottery shards, and fragments of ceramic vessels used for cooking and storage.

Reported prehistoric structural remains in the region include rock rings, hearths, hunting blinds, stone and brush game-drive corrals and drift fences and non-rock lined house depressions and storage pits.

Prehistoric Environment

While climatic changes allow for comparatively longer, more gradual periods of cultural adjustment, the near simultaneous multiple vent volcanic eruptions may have brought about immediate and severe impacts on plant, animal and human ecology. Volcanism may have affected prehistoric human occupants and archaeological sites in the following ways: 1) volcanic activity produced the valuable and intensively exploited obsidian resources which provide the primary archaeological indicators of human occupation; 2) eruptions may have rendered

portions of the region uninhabitable during certain periods, either through direct ashfall and lava flow, or indirectly, by affecting local environments; 3) volcanism coupled with hydrographic phenomena, produced numerous hot springs and geyser resources in the region, many of which were used by human groups; and 4) the deposition of pumice tephra may have obscured archaeological evidence in portions of the various survey areas.

CULTURAL RESOURCE SURVEYS

Several cultural resource surveys have been conducted in the June Lake area:

- A series of archaeological investigations was conducted during the late 1950's and early 1960's by Emma Cori Davis. In the late 1950's, she reported on the excavation of a child burial at CA-MNO-384 near Grant Lake. The burial, associated with bone artifacts, an abalone shell, and over 70 olivella shells, was discovered in a test excavation unit, as were several projectile points including Humboldt, Desert Side-notched, and possibly Elko or Little Lake types. A large obsidian biface and many groundstone fragments were also recovered. Additionally, Davis recorded petroglyphs located near the summit of one of the Mono Craters, suggesting that the petroglyphs may have functioned in child puberty ceremonies (E.L. Davis,1961).

- A small exposed site (05-04-51-5) on Oh! Ridge near June Lake was excavated by Bettinger (1973a). A total of 11.3 cubic meters was excavated from three site loci and a variety of flaked and groundstone artifacts were recovered. Only one Desert Side-notched projectile point was found. Activities represented at this site included tool repair and maintenance, and food preparation.

- Hildebrandt (1981) conducted extensive subsurface testing at the Interlaken Condominium site northwest of Gull Lake (CA-Mno-338). Work consisted of surface examinations and excavation of 33 auger holes. Three projectile points were recovered including a Humboldt, an Elko contracting stem and an Elko-like point.

- Trans-Sierran Archaeological Research completed **An Archaeological Survey of the June Lake Alternative Access Route, Mono County, California (1994)** (see the June Lake Avalanche By-Pass Road Final Environmental Impact Report). The inventory identified eleven sites in the 190 acre project area, seven newly recorded sites and four previously recorded sites. On the seven new sites, four isolates were located and recorded.

Cultural resource surveys on forest lands located in the general vicinity of June Lake are listed in Table 9.

TABLE 9
CULTURAL RESOURCE SURVEYS IN THE JUNE LAKE AREA ON FOREST LANDS

F. Year	APR #	Name and Description of Sites Located	References
F72	05-04-03	The Archaeology of Portillos' Well	Bettiger
F77	05-04-37	June Lake Parking Areas	Balint
F77	05-04-38	June Mountain Poma Lift	Self
F78	05-04-52	Hartley Springs Timber Compartment	Farrell
F78	05-04-53	East Full Lake Land Exchange	Farrell
F78	05-04-54	June Lake P.U.D.	Self
F78	05-04-68	June Lake Junction Waterline	Farrell
F79	05-04-70	Silver Lake Campground	Farrell
F79	05-04-102	Interlaken	Bodie
F80	05-04-131	Gull Lake Land Exchange	Bodie
F80	05-04-146	Reversed Peak Snowponds	Farrell
F80	05-04-189	North Village Land Exchange	Burton
F80	05-04-219	June Lake Bicycle Trail	Lipp
F83	05-04-295	June Lake Avalanche Site	Faust
F84	05-04-321	Gull Lake Cabin Removal	Lipp
F84	05-04-340	Rodeo Meadows Land Exchange	Faust
F87	05-04-406	Williams Tract Water System	Faust
F79	05-04-97	New Puma Lift	Taylor
F86	05-04-393	June Mountain Lift Courses and Access Road	Faust
F81	05-04-195	Deer Earthquake Timber Sale Compartment	Burton
F85	05-04-350	North Gull Lake Land Exchange	Reynolds

SOURCE: Clay and Hall, 1987.

HISTORIC RESOURCES

White settlers began moving into the eastern sierra and western Nevada around the middle to late 1800s. The first settlers were involved with mineral exploration and mining and were followed by support-oriented ranching, farming, and railroad enterprises. The early 1900s saw a broadening of social and economic ties to distant population centers through the construction of roadways, the Los Angeles Aqueduct and associated hydroelectric power and distribution systems, and agricultural distribution systems. In recent years, an economy based upon numerous outdoor recreational activities has evolved to complement established economic activities. The recreational component of the economy has been responsible for attracting a great portion of new growth and settlement.

The transitory nature of much of the county's boom and bust history has left relatively few physical remains. Many of the early mining and ranching buildings were torn down long ago or collapsed due to the area's extreme weather. In many cases, all that remains are changes in the land that may not be especially apparent to a casual observer. Historic structures do remain, scattered throughout the county, but no comprehensive inventory of historic structures has been

conducted. In June Lake, historic structures include the Silver Lake Resort and the Rush Creek Hydroelectric Generating Plant, both constructed in the early 1900s.

LEGISLATION PERTAINING TO CULTURAL RESOURCES

Federal, state, and local governments have developed laws and regulations designed to protect cultural resources under their jurisdiction or that may be affected by the actions they undertake. In response to these laws, lead agencies have the responsibility to: 1) inventory cultural resources within their jurisdictions; 2) assess the scientific and ethnic/social significance of identified resources; 3) identify potential direct and indirect impacts of an undertaking on these resources; 4) develop appropriate measures to avoid or otherwise mitigate adverse effects.

The National Environmental Policy Act (NEPA)

NEPA states explicitly that it is a national policy to "preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity and variety of individual choice." NEPA requires that any major federal actions significantly affecting the quality of the human environment be preceded by a detailed analysis of the impacts of the proposed action with the findings reported in an Environmental Impact Statement (EIS).

California Environmental Quality Act (CEQA)

CEQA provides protection for both material and nonmaterial resources and, like NEPA, recognizes the importance of the cultural context of these resources. CEQA requires counties to identify and mitigate the environmental effects of a project on all cultural properties which may be regarded as significant in California history and to report their findings in an Environmental Impact Report (EIR). Appendix K of the CEQA Guidelines addresses impact assessments and mitigation measures for cultural resources.

LEGISLATION PERTAINING TO ARCHAEOLOGICAL RESOURCES

The Archaeological Resources Protection Act (ARPA)

The intent of ARPA is to ensure the preservation and protection of archaeological resources on public and Indian lands. ARPA places primary emphasis on a federal permitting process which controls the disturbance and investigation of archaeological sites on these lands. ARPA also mandates consultation with local Indian tribes prior to the initiation of research on Indian lands or involving Indian archaeological resources.

LEGISLATION PERTAINING TO HISTORIC RESOURCES

Historic preservation programs encompass the full range of archaeological, historical, and Native American resources, with an emphasis on material remains (often referred to as "historic properties"). In historic preservation, the primary concern is the cultural environment, which may also include the natural environment in whole or in part. Over the past 20 years, a well-defined set of procedures has been established for the protection of significant historic properties. The system of cultural resource laws, regulations, and compliance procedures is generally referred to as the historic preservation system.

National Historic Preservation Act (NHPA)

The goal of this act is to "preserve for public use historic sites, buildings, and objects of national significance." The Act created the National Register of Historic Places and the Advisory Council on Historic Preservation. Implementing statutes supporting the Act require that federal agencies

inventory properties under their control and nominate eligible sites to the National Register. The Advisory Council also has the authority to conduct environmental impact analyses.

State Historic Preservation Office
The California Office of Historic Preservation is under the direction of the State Historic Preservation Officer (SHPO). The SHPO and state clearinghouse data repositories serve as a conduit for the inventory and assessment of cultural resources eligible for the National Register. The SHPO may also comment on environmental documents, and take the lead in the development of regional preservation programs and compliance guidelines.

County Historic Preservation Legislation
Many counties have adopted historic preservation ordinances establishing policies for preserving and protecting cultural resources. These ordinances establish a County Heritage Board, Historic Preservation Commission, or Cultural Resources Commission which researches and records County historical resources and makes historic landmark designations. The Board or Commission also advises the County Board of Supervisors on the preservation and protection of cultural resources.

LEGISLATION PERTAINING TO NATIVE AMERICAN RESOURCES

Unlike the historic preservation system, legislation relating to Native American resources has not yet been integrated. Several types of federal mandates are relevant to the participation of contemporary Native American tribes in cultural resource preservation programs, including references in historic preservation and environmental laws, in legislation addressing religious freedom, in the special trust relationship between the U.S. Government and federally recognized tribes, and in numerous historic treaties.

American Indian Religious Freedom Act
The American Indian Religious Freedom Act protects a wide range of sites, materials and cultural activities. The Act protects access to sacred sites, the use and possession of sacred objects, and the freedom to worship through ceremonial and traditional rights. Agencies are required by law to ensure that their actions do not restrict or otherwise infringe upon the customs, ceremonies, and traditions of Native American religions.

Treaties
Treaties have had relevance to environmental impact assessments in two ways: 1) they define tribal territories in whole or in part, and the contemporary "spheres of influence" of tribal groups over ancestral resources; 2) they sometimes provide the basis for litigation over the alleged "illegal taking" of land.

California Native American Historical, Cultural, and Sacred Sites Act
This Act prohibits interference with Native American religions by public agencies or contracted private parties on public lands, and prohibits the disturbance of Native American cemetaries or sacred sites by the same parties. The Act also established the Native American Heritage Commission which includes at least five members nominated by California Indian tribes. The Commission's activities relate to the inventory, treatment, and preservation of Native American burial sites and other sacred areas, and to religious freedom issues arising out of access to religious and spiritual areas and resources.

California State Senate Bill 297
This bill provides protection for American Indian burials, and empowers the Native American Heritage Commission to catalog existing burials and to resolve disputes relating to the treatment

and disposition of Indian burials and grave goods. SB 297 has been incorporated into the CEQA Appendix K Guidelines for assessing cultural resource impacts.

CULTURAL RESOURCE MANAGEMENT IN JUNE LAKE

Since Mono County has retained its rural character, the potential to find cultural resources intact is high. Agencies at the federal, state, and local levels have recognized this potential. Federal and state agencies address cultural resources in their plans and have made commitments to identify and preserve cultural resources within their boundaries.

Inyo National Forest

The Inyo National Forest Land and Resource Management Plan estimates that the Forest includes more than 35,000 prehistoric and historic cultural properties. This represents an average density of 1 site per 59 acres, in contrast to 1 site per 245 acres on the Tahoe National Forest just to the north.

Forest management strategies to protect cultural properties consist of a program of "arrested decay", monitoring and law enforcement to prevent vandalism, public education and resource interpretation, nomination of cultural and historic sites to the National Register, and working with local Native American groups to protect traditional secular and religious sites.

Bureau of Land Management

A comprehensive cultural overview of BLM lands in Mono County was conducted in 1979.

> **Bodie Planning Unit (Bridgeport Valley, Bodie Hills, Mono Basin):** The Bodie Inventory recorded 492 sites at a density of 4.5 sites per square mile in the Lower Desert Scrub plant community; 14 sites per square mile in the Upper Desert plant community; and 13 sites per square mile in the Pinyon-Juniper woodlands. Vegetation and elevation account for the varying densities within the Bodie area. Based on the above densities, the BLM estimates that there are at least 5,000 cultural resource sites in the Bodie Planning Unit. Finds in this area included 150 lithic scatters, 22 temporary camps, 13 milling stations, 10 rock alignment-hunting blinds, 3 shelter/cave sites, 1 quarry site, and 64 historic sites.

State of California

Twenty-two Points of Historical Interest have been designated in Mono County. These sites of local or regional interest are listed in Table 10.

Mono County

Community organizations in the county contribute to the preservation of cultural resources. The Mono County Library has a large collection of historic books, documents, and newspapers, and the Friends of the Library collect oral histories of pioneers. The County historical societies work to increase public awareness of the county's history and to provide interpretive services to residents and visitors.

The Mono Basin Historical Society was recently organized to address cultural resources in central Mono County. The group has relocated the old Mono Lake Schoolhouse from DWP land into Lee Vining to serve as the Mono Basin Historical Museum, and is working to gather material for the museum. The group is also performing an historic site survey which involves gathering photographic documentation of all the historic sites in Mono Basin.

TABLE 10 -- CALIFORNIA POINTS OF HISTORICAL INTEREST

Mno-001	Piute Historical Excavations
Mno-002	Mono Mills and adjacent railroad
Mno-003	Old Mammoth City
Mno-004	Lundy/Lundy Lake/Lundy Canyon
Mno-005	Deadman's Summit
Mno-006	Adaline Carson Stilts Gravesite
Mno-007	"Big Hot" Springs
Mno-008	Townsite of Mono Lake and Mono Lake itself
Mno-009	Fales' Hot Springs
Mno-010	Lee Vining and Tioga Canyon
Mno-011	Bodie Toll House
Mno-012	Buckeye Hot Springs
Mno-013	Mono Canals
Mno-014	Carson and Colorado Railroad
Mno-015	Monoville and Mono Diggings
Mno-016	Sherwin's Grade Toll Road
Mno-017	Wells Fargo's Benton Stage Station
Mno-018	Town of Coleville
Mno-019	Indian Petroglyphs
Mno-020	Dynamo Pond and Power Station
Mno-021	Bodie and Benton Railroad
Mno-022	Grave of Kit Carson's Daughter

Source: State Office of Historic Preservation

CHAPTER 11
CLIMATE AND AIR QUALITY

CLIMATE

June Lake's climate is shaped by its proximity to the Sierra Nevada and by its elevation. Elevations within the Loop range from 7,600 feet along the canyon floor to 12,000 feet at its higher mountain peaks. June Lake's mountainous environment is relatively dry and variable with strong breezes and large diurnal temperature fluctuations .

TEMPERATURE

Diurnal and seasonal variations in temperature are characteristic of the area. Temperatures tend to decrease with increasing elevation, although cold air drainages and winter temperature inversions can reverse this trend. Mean daily summer temperatures are usually between 60 F^{o} and 65 F^{o}, while mean daily winter temperatures (December through February) are usually below freezing. Summer daily maximum temperatures normally range from 75 to 85 F^{o}. Winter daily maximum temperatures are often above freezing. Significant daily temperature fluctuations of between 40 to 50 F^{o} are common in the winter.

PRECIPITATION

Precipitation is greatest in late winter and generally increases as a function of elevation. Winter storms are usually regional, whereas summer thunderstorms are localized. An isohyetal map of the Mono Basin, which includes the June Lake area, was prepared in 1979 as part of a Department of Water Resource study entitled, **Mono Lake, California Water Balance** (Figure 14). Over the 17-year study period (1951-78), contours of average annual precipitation (isohyetal) for the June Lake area indicate that the mean ranged from 50 inches at the higher elevations to 20 inches on the canyon floor.

WIND

The prevailing winds in the Mono Basin are from the southwest. Strong winds occur in every month of the year, but are more frequent in the late winter and spring. Light afternoon winds are typical in the summer due to temperature differences between the basin floor and the surrounding mountains.

INVERSIONS

Inversions, atmospheric conditions where warmer air overlies cooler air found at ground level, influence air quality by restricting pollutants emitted within this cooler layer from dispersing vertically into the warmer layer. In Mono County, inversions have particular importance because together with topography, which limits the horizontal dispersion of pollutants, they act to create

the potential for high pollutant concentrations in the County's basins and valleys, the places where development is located. Morning mixing heights in Mono County are typically about 1,000 feet above the surface (Mono County MEA).[2]

Inversions and their corresponding mixing heights lift during the day as the sun warms the cooler surface layer. The extent of lifting during the day is highly seasonal. In winter, afternoon mixing heights are typically about 3,300 feet, less than one-half of the heights typical for other seasons (Mono County MEA).

In June Lake, significant air quality degradation is frequently associated with inversion conditions that occur from late fall through spring. During inversions, particulate matter is poorly dispersed and trapped under the layer of warm air. Inversions are usually dissipated by daytime warming and increased wind movements.

[2]The mixing height is the height from the ground to the base of the inversion. The volume of the well-mixed layer of air below the inversion determines the extent to which pollutants emitted near ground level can be diluted.

FIGURE 14 ISOHYETAL MAP

AIR QUALITY

EXISTING AIR QUALITY

The June Lake Loop has excellent air quality, except on a few winter days when temperature inversions trap air pollutants. Potential pollutants include emissions from wood-burning devices, re-entrainment of roadway particulates, and exhaust from internal combustion engines. The following excerpt from the Mono County MEA discusses overall air quality in Mono County.

National Non-Attainment Areas

As of 2000, the Mono Basin and Mammoth Lakes were designated as non-attainment areas for the national particulate matter (PM_{10}) standard, although the California Air Resources Board recommended that those areas be designated as attainment areas (see www.arb.ca.gov, National Area Designations Map – PM10). Particulate matter (PM_{10}) in the Mono Basin results from dust from the exposed lakebed of Mono Lake. PM_{10} in Mammoth Lakes is primarily a problem in winter, resulting from wood burning and resuspended road cinders.

PM_{10} concentrations in the Mono Basin have been declining in recent years, as the level of Mono Lake rises and less lakebed is exposed [see www.arb.ca.gov , PM10 Air Quality Data Summaries (1993-1997)]. PM_{10} concentrations in Mammoth Lakes have remained relatively stable in recent years (ibid).

State Non-Attainment Areas

As of 2000, Mono County was designated as a non-attainment transitional area for the state ozone standard, indicating that the county is close to attaining the standard for that pollutant. Ozone data collected by the State Air Resources Board in Mammoth Lakes indicate that ozone concentrations have decreased in Mammoth in recent years and the area has not exceeded state or federal standards in recent years [see www.arb.ca.gov ,Ozone Data Summary (1995-1998)]. In the past, the State Air Resources Board concluded that ozone exceedence in the Great Basin Air Basin (Alpine, Inyo and Mono Counties) was caused by transport from the San Joaquin Valley Air Basin; the Great Basin Unified Air Pollution Control District adopted an Ozone Attainment Plan for Mono County which identified the County as an ozone transport area.

As of 2000, the County was also designated a non-attainment area for the state PM_{10} standard (see www.arb.ca.gov , State Area Designations Map – PM10).

Transportation Related Air Quality Mitigation

Transportation related air quality impacts in Mono County occur only in Mammoth Lakes (PM_{10} emissions resulting primarily from resuspended road cinders). As a result, the Air Quality Management Plan for the Great Basin Unified Air Pollution Control District (GBUAPCD) does not include any transportation related requirements other than for the Town of Mammoth Lakes.

Sensitive Receptors

Land uses such as schools, hospitals, and convalescent homes are considered relatively sensitive to poor air quality because the young, the old, and the infirm are more susceptible to respiratory infections and other air-quality-related health problems than the general public. Agricultural crops, especially broad-leaved produce crops and cultivated flowers, are also sensitive to air pollutants such as ozone, nitrogen oxides, and sulfur dioxide.

Residential districts are sensitive to air pollutants because people, including the young and old, are at home for extended periods so exposure periods are long. Industrial and commercial districts are less sensitive to poor air quality because exposure periods are shorter and workers in these districts are, in general, the healthiest segment of the public.

Wilderness Areas, National Parks, and State Parks are also sensitive to air pollutants. Noticeable air pollution and the corresponding reduction in visibility detracts from the recreational experience. Toiyabe National Forest includes Carson-Iceberg Wilderness Area to the north and part of Hoover Wilderness Area to the south. Inyo National Forest contains John Muir, Ansel Adams, and the remaining parts of the Hoover Wilderness Areas. While no national parks are located in Mono County, Yosemite National Park lies just to the west and Kings Canyon National Park lies just to the south. Both could be adversely affected by pollutant emissions originating in Mono County. Nearby Class I PSD areas where no deterioration of air quality would be allowed are Yosemite and Kings Canyon National Parks and Hoover Wilderness area. The remaining wilderness areas are too small to be designated as Class I PSD areas.[3] State Park units in the county which are sensitive to air quality impacts include Bodie State Historic Park and Mono Lake Tufa State Reserve.

REGULATORY FRAMEWORK

The June Lake planning area, designated as a Class II Air Quality Region, lies within the Great Basin Valley Air Basin and is under the jurisdiction of the Great Basin Unified Air Pollution Control District (GBUAPCD). Local air quality must meet both federal ambient air quality standards established by the Environmental Protection Agency (EPA) pursuant to the Clean Air Act and state standards established by the California Air Resources Board. The GBUAPCD monitors air quality and enforces these standards.

POLLUTANT SOURCES

Woodburning Emissions

Fireplaces and wood stoves are in general use throughout the June Lake area and contribute significant amounts of air pollutants during winter use. The major atmospheric pollutants of concern are unburnt combustibles, such as carbon monoxide, gaseous organic and particulate matter, produced as a result of incomplete or inefficient combustion.

Fireplace emissions are highly variable and are primarily a function of wood characteristics and operating practices. During the early stages of the burning cycle a fast burn rate and higher flame intensity enhances secondary combustion and thereby lowers emissions. Conversely, higher emissions result from a slow burn rate and lower flame intensity.

The thoroughness of combustion and the amount of heat transferred from wood stoves depends heavily on fire box temperatures, the time spent in the fire box and mixing. Temperatures, time and mixing are effected by air flow through the stove and by the mode of stove operation. Emissions also depend on the burn rate; as the burn rate decreases, emissions increase for the great majority of closed combustion devices.

[3]Attainment areas where no deterioration of air quality is allowed are designated Class I--Prevention of Significant Deterioration (PSD) areas.

In addition to unburnt combustibles, lesser amounts of nitrogen oxides, sulfur oxides and volatile organic compounds are emitted from fireplaces and wood stoves.

Vehicle Emissions

Emissions generated from automobile usage in June Lake degrade local air quality and in turn, cause health, safety and aesthetic impacts. While some portions of the total auto emissions are associated with traffic on U.S. 395, most can be attributed to automobile trips originating, terminating or occurring within the Loop itself. Areas that concentrate vehicular activity, such as the June Lake Village or June Mountain Ski Area, tend to have the highest levels of air pollutants.

While the effects of auto emissions on local air quality have not yet been studied, vehicle emissions for total organic gas, reactive organic gas, carbon monoxide, oxides of nitrogen and particulate matter have been predicted for Mono County by GBUAPCD staff.

Another important contribution to air quality degradation in the planning area relates to suspended particulates originating from unpaved roads. Unpaved road dust (and all particulates) raises the level of total suspended particulates and reduces visibility.

CHAPTER 12
GEOLOGY AND SOILS

GEOLOGY

June Lake is located in a deep glacially formed canyon on the eastern escarpment of the Sierra Nevada mountains. The geology within the June Lake Loop reflects periods of glacial activity interspersed with periods of volcanic activity.

GEOLOGIC SETTING

Four prominent geologic features characteristic of the Eastern Sierra Nevada exist near June Lake. These include: the eastern escarpment of the Sierra Nevada fault; the glaciated valleys and moraines extending from the lower Sierra foothills into the high desert plains; the Mono Basin, an immense sump area with no natural surface outlet; and the Mono Craters range of recently active volcanoes. The formation of the Sierra Nevada extended from the late Jurassic period to the early Pleistocene, when the last major uplift along the Sierra Nevada fault created the Eastern Sierra scarp. Repeated episodes of glaciations and volcanic activity both before and after this last uplift have given the eastern Sierra Nevada (and the June Lake Loop) many of its prominent features. The horseshoe-shaped canyon that contains June, Gull, Silver and Grant Lakes and Reversed and Rush Creeks is of geologic importance to the June Lake Loop. Glaciers carved out the horseshoe-shaped canyon and separated it into two lobes on either side of Reversed Peak. Faulting and less resistant rock types account for the deeper and narrower canyon on the Grant Lake side when compared to the June Lake side. As a result, Reversed Creek exhibits an unusual flow pattern as it flows towards instead of away from the Sierra Nevada front range.

The principal geologic units of the Loop area are pre-Tertiary granitic rocks, Tertiary and Quaternary volcanic rocks, Pleistocene glacial deposits and recent alluvium. The alluvial material which forms much of the valley floor varies in thickness from 25 to 100 feet and is comprised primarily of silty sands, gravel and dispersed boulders which are commonly associated with alluvial and glacial deposition. The Inyo-Mono volcanic chain, which stretches from Mammoth Mountain to Mono Lake, contains obsidian domes, extensive local tephra deposits and pyroclastic ash flows, cinder cones and numerous explosion pits. Ash, dust, and pumice ejected from the volcanoes in this chain cover much of the area.

A geologic map of the southern section of the Mono Craters Quadrangle (which includes the June Lake Loop) is presented in Figure 15. Map cross sections B-B' and C-C' are shown in Figure 16. Table 11 contains the corresponding key for the rock types identified in the maps.

TABLE 11
KEY TO GEOLOGIC MAP OF THE MONO CRATERS QUADRANGLE, MONO AND TUOLUMNE COUNTIES, CALIFORNIA.

ORDOVICIAN AND SILVRIAN
Metamorphosed sedimentary rocks of the log cabin mine pool pendant.

SOm - Marble and calc-silicate hornfels.
SOg - Biotic-bearing quartzite.
SOx, SOa - Older-sedimentary rocks.
SOc - Marble, calc-silicete hornfels and quartzite.
SOh - Quartzofeldspathic hornfels.
SOs - Marble and calc-silicate hornfels.

PENNSYLVANIAN AND PERMIAN
Metamorphosed sedimentary rocks of the Gull Lake roof pendant.

PPH - Quartzofeldspathic hornfels.
PPm - Carbonaceous marble.
PPg - Calc-silicate hornfels, quartzite and quartzofeldspathic hornfels.
PPc - Marble and calc-silicate hornfels.

Angular Unconformity

PPh - Quartzofeldspacthic hornfels, carbonaceous marbles.

PERMIAN AND JURASSIC
Metamorphosed sedimentary and volcanic rocks of the Ritter Roof pendant.

Angular Unconformity

PC - local basal conglomerate.
PT - Felsic volcanic tuffs, volcanic flows, local graywackes.
Pa - Andesite flows and local breccias, local graywackes and sandstone lenses.
Ph - Quartzofeldspathic hornfels, calc-silicate hornfels, volcanic flows.
Jc - Local based conglomerate.
Jt - Volcanic tuffs and flows, lapilli-tuff, shale and calc-silicate hornfels.
Jx - Graywackes, volcanic tuffs and flows, crossbedded sandstones.

TABLE 8 - Cont.

JURASSIC AND CRETACEOUS (Granitic Rocks)

Jdo - Diabase of Reversed Creek.
Jb - Quartz Monzonite of Billy Lake.
Jr - Granodiorite of Rush Creek.
Jw - Diorite of Waugh Lake.
Jla - Garnet bearing aplite.
Jl - Wuartz monzonite of Lee Vining Canyon.
Jd - Diorite of Bloody Canyon.
Jm - Granodiorite of Mono Dome.
Jg - Gabbro.
Ke - Quartz monzonite of Ellery Lake.
Kgu - Granite rocks, undifferentiated.
Kk - Granodiorite of Kuna Crest.
Ks - Sheared granodiorite of Koip Crest.
Kjm - Quartz monzonite of Mono Lake.
Ka - Quartz monzonite of Aeolian Buttes.
Kwc - Wheeler Crest Quartz Monzonite.

TERITARY AND QUATERNARY (Volcanic Rocks & Glacial Deposits)

Ta - Volcanic and sedimentary rocks (VSR) andesiticcrystal lithic tuff.
Tgt - Vsr, quartz latite of Two Teats.
Tcl - VSR, indurated conglomerate.
Tda - Hypabyssal rocks, undifferentiated.
Qsh - Till of the Sherwin Glaciation.
Qto - Old fill, probably of Sherwin Glaciation.
Qbt - Bishop Tuff.
Qam - Andesite of the Mono Craters.
Qtao - Older till of the Tahoe Glaciation.
Qta - Till of the Tahoe Glaciation.
Qb - Basalt of the June Lake Junction.
Qti - Till of the Tioga Glaciation.
Ql - Lake beds.
Qa - Andesite.
Qal - Surficial deposits (sd) alluvium and pumice.
Qsl - Sd, landslide or inactive rock glacier.
Qts - Sd, talus and slopewash.
Qt - Sd, talus.
Qrg - Sd, rock glacier.
Qm - Sd, cirque moraine.
Qr - Rhyolite of Mono Craters (RMC) rhyolite domes.
Qrf - RMC, obsidian flows.
Qro - RMC, older rhyolite domes.

FIGURE 15
GEOLOGIC MAP

FIGURE 16
CROSS SECTIONS OF GEOLOGIC FEATURES

SOILS

The topography in the June Lake area ranges from relatively flat mountain valleys and basins to rugged moraines and mountains. The area's soil is formed from either granite and rhyolitic rock sources or from aerially-deposited ash and pumice material which overlays the original granite and rhyolitic soils. Soils information was prepared by a soil scientist from the US Soil Conservation Service.

SOIL TYPE AND LOCATION

The June Lake Loop's soil types and locations are mapped and depicted in Figure 17 and Table 12. Soil type characteristics, such as the depth to bedrock, erosion hazard rating and waste holding capacity of each soil type, are noted in Table 13. The area's soils have low to moderate fertility, and are moderately to highly susceptible to erosion in their present state. Most of the soils are deep (greater than 60 inches to bedrock). Their available water capacity ranges from low to high, with the majority being in the low to moderate category. The present erosion hazard ranges from low to high, but most of the soils are in the moderate to high range. Soils which presently display high erosion or have a potentially high erosion rate are those in Units A101, A132, A134, A135, A140, A151, A152, A153, BFC and JFD with the A135 Unit having the highest potential for erosion. The soils of the area are relatively fragile, and are subject to loss through erosion if disturbed. The sandy texture makes them subject to erosion once existing vegetative cover, vegetative litter, and surface rock fragments are removed.

Units with potential irretrievable losses are: A101, A132, A135, A148, A153, BFC, and parts of BGC, CGC, and JFD. These soils, when disturbed, possess high erosion potentials. Efforts at mitigating soil erosion on these soils are costly, and the results generally marginal. From a soil resource perspective, these areas when highly disturbed, are considered sacrifice areas.

Units which may be partially mitigated are: A115, A121, A133, A134, A140, A142, A144, A149, A152, A122, STMD, and parts of CGB, and JPD. These soils have high erosion hazard potentials when disturbed. Efforts at mitigating soil erosion in these areas are costly and, depending on the techniques used and site-specific considerations, only low to moderately successful.

Units which may be fully mitigated or will suffer only limited accelerated erosion from manipulation are: 1A, and parts of BGC, KCGB, and CGC. When disturbed, these soils have low to moderate erosion hazard potential and mitigation projects generally prove successful.

Units which have no potential for erosion are those which are made up of rock outcroppings and rubbleland. Although no erosion potential exists for these units, there is a hazard of rock movement in the rubbleland components, units A102 and A117.

TABLE 12
SOIL UNIT MAP

A101:	Typic Cryorthents, ashy over cindery - Stonewell family, cold-rock outcrop complex, 30 to 60 percent slopes.
A102:	Rubbleland, rhyalitic - rock outcrop complex.
A115:	Entic Ulbx Haploxerolls, ashy - Stonewell family, warm complex, 15 to 30 percent slopes
A117:	Rock outcrop, granitic - Rubbleland complex.
A121:	Entic Ultic Haploxerolls, ashy - Oosen family, warm, complex, 15 to 30 percent slopes.
A132:	Corbett family - Rock outcrop, rhyolitic - Railcity family complex, 30 to 60 percent slopes.
A133:	Corbett family - Rock outcrop, rhyolitic - Railcity family complex, 15 to 30 percent slopes.
A134:	Typic xeropsamments, ashy, 2 to 15 percent.
A135:	Typic xeropsamments, ashy - rock outcrop complex, 30 to 60 percent slopes.
A139:	Brantel family, 2 to 15 percent slopes
A140:	Xeric torripsamments, ashy - rock outcrop association 15 to 60 percent slopes.
A142:	Brantel family - rock outcrop complex, 2 to 30 percent slopes.
A144:	Xeric Torripsamments, ashy, 2 to 30 percent slope.
A146:	Xeric Tomorthents, ashy over cindery, warm - Brantel family complex, 2 to 15 percent slopes.
A148:	Stecum - Salt Chuch family complex - 30 to 75 percent slopes.
A149:	Wapal family - Entic Ultic Haploxerolls, ashy, 15 to 30 percent slopes.
A151:	Oosen family, warm - rock outcrop, granite complex, 15 to 60 percent slopes.
A152:	Typic (Dystric) Cryopsamments, ashy - rock outcrop 15 to 30 percent slopes.
A153:	Typic (Dystric) Cryopsamments, ashy - rock outcrop complex, 30 to 60 percent slopes.
BFC:	Oosen family, cold-rock outcrop complex, 30 to 60 percent slopes.
BGC:	Wrango - Grove families complex, 30 to 60 percent slopes.
CGB:	Wrango - Berent families complex, 2 to 30 percent slopes.
CGC:	Wrango - Berent families complex, 30 to percent slopes.
JFD:	Rock outcrop, granite-Wapal - Sirretta families complex, 30 to 70 percent slopes.
122E:	St. Mary's family, 15 to 60 percent.
STMD:	St. Mary's family, 60 to 80 percent.
1A:	Ola - Ginser families complex, 0 to 15 percent slopes.

Source: USFS, 1987.

FIGURE 17
SOIL UNIT MAP

TABLE 13
SOIL CHARACTERISTICS

Map Unit Number/Component		Depth of Bedrock (Inches)	EHR (1)	EHR, Max. (2)	Available Water Holding Capacity (Inches) (3)
A101:	Typic Cryorthents, ashy cindery	>60	Mod-High	High-V.High	1.70 to 3.20
	Stonewell family, cold	>60	High	Very High	1.70 to 2.80
	Rock Outcrop	--	--	--	--
A102:	Rubbleland, rhyalitis	--	--	--	--
	Rock Outcrop, rhyolitic	--	--	--	--
A115:	Entic Ultic Haploxerolls, ashy	760	High	High	3.10 to 4.20
	Stonewell family, warm	>60	Mod.	High	1.70 to 2.80
A 117:	Rock Outcrop, granitic	--	--	--	--
	Rubbleland, granitic	--	--	--	--
A121:	Enbc Ultic Haploxerolls, ashy	>60	High	High	3.10 to 4.20
	Oosen family, warm	>60	Mod.	High	2.40 to 3.40
A132:	Corbett family	>60	Mod-High	High-V. High	.70 to 1.70
	Rock Outcrop, Phylitic	--	--	--	--
	Railcity family	>60	Mod-High	High-V.High	1.10 to 2.40
A133:	Corbett family	>60	Mod.	High	.70 to 1.70
	Rock Outcrop, rhyloitic	--	--	--	--
	Railcity family	>60	Mod.	High	1.10 to 2.40
A134:	Typic Xeropsamments, ashy	>60	High	High	1.90 to 3.70
	Rock Outcrop	--	--	--	--
A135:	Typic Xeropsamments, ashy	>60	High-V.High	High V. High	1.90 to 3.70
	Rock Outcrop	--	--	--	--
A139:	Brantel Family	>60	Mod.	High	1.00 to 2.70
A140:	Xeric Torripsamment, ashy	>60	Mod-High	High	1.40 to 3.40
	Rock outcrop	--	--	--	--
A142:	Brantel family	>60	Mod.	High	1.00 to 2.70
	Rock outcrop	--	--	--	--
A144:	Xeric Torripsamments, ashy	>60	Mod.	Mod-High	1.40 to 3.40

A146:	Xeric Torriarthents,	>60	Mod.	High	1.10 to 2.50

TABLE 10 -- SOIL CHARACTERISTICS -- cont.

Map Unit Number/Component		Depth of Bedrock (Inches)	EHR (1)	EHR, Max. (2)	Available Water Holding Capacity (Inches) (3)
	Brantel family	>60	Mod.	High	1.00 to 2.70
A148:	Stecum family	>60	Mod-High	High-V.High	0.60 to 1.50
	Salt Chuch family	40-60	Mod-High	High-V.High	.75 to .85
A149:	Wapal family	>60	Mod.	High	2.40 to 3.00
	Entic Ultic Haploxerolls, ashy	>60	High	High	3.10 to 4.20
A151:	Oosen family, warm	>60	Mod-High	High-V. High	2.40 to 3.40
	Rock Outcrop, granitic	--	--	--	--
A152:	Typic (Dystric) cryopsamments, ashy	>60	Mod-High	High	2.10 to 3.80
	Rock Outcrop	--	--	--	--
A153:	Typic (Dystic) cryopsamments, ashy	>60	High	High-V.High	2.10 to 3.80
	Rock Outcrop	--	--	--	--
BFC:	Oosen family, cold Rock outcrop	>60	High	V. High	2.40 to 3.40
BGC:	Wrango family	40 to 60	Low-Mod.	Mod.	2.00 to 2.70
	Grove family	>60	Mod-High	High-V.High	2.10 to 3.20
CGB:	Wrango family	40 to 60	Low-Mod.	Mod.	2.00 to 2.70
	Berent family	>60	Mod-High	High-V.High	3.00 to 4.50
CGC:	Wrango family	40 to >60	Low-Mod.	Mod.	2.00 to 2.70
	Berent family	>60	Mod-High	High-V.High	3.00 to 4.50
JFD:	Rock Outcrop, granitic	--	--	--	--
	Wapal famiily	>60	Mod-High	High V.High	2.40 to 3.00
	Sirretta family	>60	Mod-High	Mod-High	0.60 to 0.70
122E:	St. Mary's family	>60	Low-Mod.	Mod-High	.60 to .70
STMP:	St. Mary's family	>60	Mod.	High	0.60 to 0.70
1A:	Ola family	20 to 40	Mod.	Mod.	3.20 to 4.00
	Ginser family	>60	Low	Low	3.40 to 4.00

Notes:

1. - Erosion Hazard Rating of soil under present conditions.
2. - Erosion Hazard Rating of soil when disturbed.

3. - Available water holding capacity to a depth of 60 inches, or bedrock, whichever is shallower.

Source: USFS, 1987.

CHAPTER 13
HYDROLOGY

WATER RESOURCES

Water resources play an extremely important role in maintaining June Lake's unique mountain character and its water based recreational economy. The following summarizes the existing conditions of water resources in the Loop including the surface and subsurface hydrology, the water quality of lakes and streams, the effects of water exported for domestic uses and instream values.

SURFACE HYDROLOGY

Nearly all developed lands in June Lake are situated within the southeast portion of the Rush Creek Basin. This basin includes five distinct watersheds (Table 14) all of which are located within the Mono Lake Hydrologic Unit (Figure 18).

TABLE 14 RUSH CREEK BASIN WATERSHED AREAS

WATER SHED	AREA (sq. miles)
Alger Creek Subunit	11.9
Parker Creek Subunit	7.9
Reversed Creek Subunit	14.0
Rush Creek Subunit	23.2
Walker Creek Subunit	10.2

The Rush Creek Basin provides dramatic relief with elevations ranging from 6,500 feet along the Rush Creek riparian corridor above Mono Lake to near 13,000 feet in the uppermost reaches of the Ansel Adams Wilderness Area. The Basin is dotted with glaciers and high alpine lakes and streams, all of which were tributary to Mono Lake before the installation of stream diversion facilities.

All surface and subsurface flows within the Loop originate as precipitation that falls on the Reversed Creek, Rush Creek and Alger Creek subunits. The bulk of these flows result from spring and summer melt of the previous winter snowpack. Over two-thirds of the average annual precipitation occurs during the months of November through March. Lesser amounts are derived from convenctional downpours that occur during the summer.

FIGURE 18
MONO LAKE HYDROLOGIC UNIT

Reversed Creek Subunit

Surface water flows on the floor of the Loop begin at June Lake and terminate at the mouth of Rush Creek at Mono Lake. June Lake, Gull Lake and Reversed Creek are sustained by tributary flows out of the 14.0 square mile Reversed Creek Subunit. With the exception of a concentrated area of springs along its west shore, all tributary drainage into June Lake is thought to occur as subsurface flow from percolating precipitation. At a lake level of 7610 feet, storage in June Lake has been estimated at 17,800 acre feet. Outflow from June Lake normally occurs during the spring and lasts from one to three months depending on the previous winter's precipitation.

Gull Lake also receives the majority of its supply from subsurface springs. Secondary supply sources include surface and subsurface drainage from June Lake and surface flows from numerous springs located along its north and south shorelines. At a lake level elevation of 7,595.0 feet, lake volume in Gull Lake has been calculated at 2,412.6 acre-feet; at a lake level elevation of 7534.4 feet, lake volume in Gull Lake has been calculated at 0 acre-feet (US Geological Survey Open-File Report 95-702, p. 3).

Reversed Creek, which originates as spillover from Gull Lake, collects the balance of all surface drainage out of the Reversed Creek watershed. The principal tributaries to Reversed Creek are Gull Canyon Creek, an ephemeral stream whose drainage area encompasses a portion of the June Mountain Ski Area; Snow Creek, a principle domestic supply source for the June Lake Public Utility District (JLPUD); Yost Creek, an untapped stream; and Fern Creek, one of two principal surface suppliers diverted for domestic use by the JLPUD in the Down Canyon area. The remaining drainage originates from unnamed springs and streams.

Two flow measuring stations are currently maintained within the Reversed Creek Watershed: one on Reversed Creek below its outlet at Gull Lake; and one on Snow Creek at the JLPUD Diversion Dam. Both are maintained and read by JLPUD staff on a weekly basis. Measurements taken at the Reversed Creek station between November 1984 and November 1987 ranged from less than 0.35 cubic feet/second (cfs) on 7-16-85 to 9.62 cfs on 3-11-86, and averaged 1.39 cfs over the three year period. Measurements taken at Snow Creek for the same period ranged from 0.48 cfs in September of 1987 to 2.14 cfs in May of 1986, with an average flow of 0.96 cfs for the three year period. Gauging stations to measure flows at other domestic water sources have not been developed.

Upper Rush Creek Subunit

The upper Rush Creek Subunit has a tributary drainage area of 23.3 square miles. Surface drainage out of this watershed is controlled through a series of reservoirs with operations coordinated by the Southern California Edison Company (SCE) and the Los Angeles Department of Water and Power (LADWP). SCE reservoirs regulate stream flows above LADWP diversion facilities for hydro-electric power production and LADWP uses Grant Lake Reservoir for domestic water storage.

Water released from the Rush Creek powerplant over and/or through the Agnew Lake Dam flows into a natural streambed that flows into Silver Lake. Reversed Creek flows into and becomes part of Rush Creek above Silver Lake. Records kept by SCE for their flow recording station located below Agnew Lake shows an "actual flow" [4]of 55.9 cfs for the 23-year period beginning 1951 and ending 1974. At a lake level elevation of 7,217.5 feet, lake volume in Silver Lake has been calculated at 3,060.0 acre-feet; at a lake level elevation of 7,156.0 feet, lake volume

[4] Actual flow -- The total flow of Rush Creek below Agnew Lake and Rush Creek powerplant tailrace.

in Silver Lake has been calculated at 0 acre-feet (US Geological Survey Open-File Report 95-702, p. 6).

Alger Creek Subunit

The northern most watershed with major tributary drainage into Loop waters is Alger Creek. This subunit has a drainage area of approximately 11.9 square miles. During the summer, a portion of Alger Creek's flow is diverted as the primary domestic water supply for residences and commercial establishments in the immediate vicinity of Silver Lake. A flow measuring station has not been developed for this stream and its flow ranges are unknown at this time. Silver Lake is also the terminus for surface flows out of this watershed.

Silver Lake and Middle Rush Creek

Silver Lake, which is fed by tributary drainage from the Reversed Creek, Rush Creek and Alger Creek subunits, has an estimated volume of 3,389 acre feet at a surface water elevation of 7,217 feet. The amount and source of subsurface flows into Silver Lake have not yet been determined.

Overflow from surface and subsurface drainage into Silver Lake re-enters the Rush Creek drainage near the northeast corner of the lake. Small perennial and ephemeral flows from surrounding mountain springs add to its volume as it courses towards Grant Lake, about 2.5 miles downstream of the Silver Lake discharge.

Flows in this section of Rush Creek are measured at the Los Angeles Department of Water and Power (LADWP) Rush Creek measuring station located 0.6 miles upstream of Grant Lake. LADWP records for the 37-year period beginning in 1937 and ending in 1974 indicate an average annual discharge of 81.8 cfs through this facility.

Grant Lake

Grant Lake, located at the northern end of the June Lake Loop, is a man-made reservoir constructed, operated and maintained by the LADWP as part of their Los Angeles Aqueduct System. The reservoir is supplied by four principal streams including Rush Creek, the main tributary of the June Lake Loop, and Parker, Walker and Lee Vining Creeks, streams that are diverted from watersheds north of the June Lake Loop. The capacity of Grant Lake is estimated at 47,500 acre feet.

With the exception of court-ordered maintenance flows released to Rush Creek below Grant Lake and Lee Vining Creek below its check dam, surface waters from Grant Lake are exported by the City of Los Angeles for municipal use and hydro-electic power generation. Exports have averaged close to 93,000 acre feet/year since the completion of the Los Angeles Aqueduct's second barrel in 1970.

Parker and Walker Creeks

Parker and Walker Creeks once flowed in the Planning Area north of Grant Lake. These creeks supported riparian corridors and self-reproducing trout populations. With the exception of controlled releases for pasture irrigation on City of Los Angeles lands, surface flows have been completely diverted by the LADWP. Recent court decisions, however, have invalidated the current diversion practices, and have required the LADWP to reconstruct the historic Walker and Parker Creek channels and re-water them.

SUBSURFACE HYDROLOGY

Due to the availability of surface water supplies within the Loop, significant development of groundwater resources has not been necessary. Groundwater usage is limited to domestic wells operated by the June Mountain Ski Area, a few commercial establishments and scattered single-family residences located in the Down Canyon area of June Lake.

Limited hydrologic information for the June Lake Loop was collected during a reconnaissance level investigation initiated by the California Department of Water Resources in September, 1974. The study was limited to an evaluation of the groundwater resources in the alluvium between Gull Lake and Silver Lake. Meadow areas between June and Gull Lakes were not included as previous investigations indicated that groundwater was probably unconfined and combined with subsurface flows between the lakes. Developing wells in this area would simply draw water from the lakes rather than from an independent underground source. The alluvium downstream of Silver Lake was not studied because of funding limitations and because of the impracticality of developing a domestic water supply so far from June Lake's developed communities.

Groundwater within the June Lake Loop originates from precipitation in the surrounding watersheds. Beginning in the spring, rainfall and melting snowpack percolates to recharge underground reservoirs and aquifers. Subsurface seepage and streamflow infiltration into underlying sediments also help to replenish the groundwater supply. The total amount of natural replenishment has not been determined.

The area between Gull Lake and Silver Lake is made up of marine sediments, igneous rocks, glacial moraines and recent alluvium. These formations are categorized as non-water bearing or water bearing, based upon whether significant amounts of water can be retained in the formations. Nonwater-bearing formations consist of consolidated marine sandstones and mesozoic granitics. These hardrocks form the foundation of the Loop. Water-bearing formations consist of unconsolidated glacial till and alluvium in the form of sands, silts and clays.

The alluvium filled meadows adjacent to Reversed Creek were found to be the most promising sites for developing future ground-water supplies. Specific yield from these sites would probably be low, however, because they contain a high percentage of fine sediment derived from the erosion of moraines bordering the Valley. Seven to ten percent of these alluviums are estimated to contain water. Using a storage factor of seven percent, the total water in storage between Gull Lake and Silver Lake has been estimated at 650 acre feet.

The JLPUD also drilled a test hole immediately north of Gull Lake at its Snow Creek water filtration plant site. Test pumping at depth of 440' in almost entirely fractured hard-rock, indicated a low but acceptable specific yield of .6 gpm/foot of draw-down. The District may drill at this site to supplement water supplies as new development demands more water than Snow Creek can provide in the dry fall season.

A summary of the estimated groundwater in storage for the areas identified in Figure 19 is shown on Table 15. The water in storage represents the amount of water in the sediments at a given time and water level. Because the groundwater is actually in a transient state moving downstream as subsurface flow or surfacing in the creek channel, the subsurface flows would have to be estimated to determine the actual groundwater supply.

TABLE 15
GROUNDWATER IN STORAGE AT 7% SPECIFIC YIELD

Subarea	Acres	Average Sediment Depth Feet	Water in Storage Acre-feet
A1	14.5	75	70
A2-N	5.0	70	20
A2-S	25.0	100	160
A3	21.0	75	100
A4-1	29.0	20	30
A4-2	37.0	40	100
A5-E	13.0	30	25
A5-W	34.0	50	110
A6	8.0	60	30
Totals	186.5		650

Source: DWR, 1981.

FIGURE 19
LOCATION OF GROUNDWATER SUBAREAS

WATER QUALITY

JUNE, GULL AND SILVER LAKES

Biologically significant water quality information for the Loop's lakes and streams is available in several studies: **Water Quality Study - June Lake Loop,** 1979, by Randall L. Brown, California Department of Water Resources, U.S. Geological Survey Open-File Reports 95-394, **Water-Quality Data for Selected Sites on Reversed, Rush and Alger Creeks and Gull and Silver Lakes, Mono County California, April 1994 to March 1995** and USGS Open-File Report 95-702, **Storage Capacity, Detention Time, and Selected Sediment Deposition Characteristics for Gull and Silver Lakes, Mono County, California**.

Expanded development in the June Lake Loop has raised concerns about the effects of urbanization on water quality in the loop's lakes. Specific concerns are increased eutrophication of Gull Lake and Silver Lake and increased sedimentation at the inlet to Silver Lake. The USGS studies were conducted to address those concerns.

Water quality parameters examined during the 1979 study by Randall Brown included: 1) dissolved oxygen (DO) and temperature; 2) phytoplankton free floating algae and nutrients; 3) zooplankton (microscopic animals); 4) light penetration; and 5) dissolved minerals. The study focused on June, Gull and Silver Lakes and to a lesser extent Reversed and Rush Creeks. Table 16 describes the study sites. Analysis of the study's water quality data indicates that surface water in the June Lake Loop is of excellent quality for domestic consumption, fish habitat and other beneficial uses.

The water quality study conducted in the Loop during 1994 by the USGS (US Geological Survey Open-File Report 95-394) focused on similar parameters. Water samples were analyzed for major ions and trace elements, nutrients, methylene blue active substances, oil and grease. Field measurements were made for discharge, specific conductance, pH, water temperature, barometric pressure, dissolved oxygen, and alkalinity. Additional data collected included vertical water profiles of specific conductance, pH, water temperature and dissolved oxygen for Gull and Silver Lakes; cholorophyll-*a* and -*b* concentrations and Secchi depth for Gull and Silver Lakes; sediment interstitial-water nutrient concentrations in cores from Gull Lake; and lake surface and volume of Gull and Silver Lakes. Specific information on study sites and results is contained in the report; findings are summarized in the following sections.

TABLE 16 -- SAMPLING STATIONS, JUNE LAKE STUDY, 1977

Station Name	Station Location
Stream	
R-1	Outlet from Gull Lake at weir--right below S.R. 158.
R-2	Reversed Creek immediately above confluence with Rush Creek.
R-3	Rush Creek at Powerhouse--at S.R. 158 bridge.
R-4	Rush Creek between Silver and Grant Lake at old weir structure.
Lakes	
JL-1	June Lake near S.E. shore in area of maximum depth.
JL-2	June Lake near N.W. corner in about 80 feet of water.
GL-1	Gull Lake, due north of Marina, just past mid-lake in about 65 feet of water.
Sl-1	Silver Lake, area of maximum depth off N. shore.
G-1	Grant Lake, just east of narrow channel.

Source: DWR, 1981.

Dissolved Oxygen and Temperature

Water temperatures and dissolved oxygen control the amount of aquatic habitat available for fish and other organisms. Variations in water temperatures during the early spring and summer months cause lakes in the Loop to stratify into various layers. Waters warmed by the relatively higher air temperatures tend to stratify over heavier, cool waters. During periods of stratification, water temperatures vary from around 70^{o} F near the surface to 40^{o} F near the bottom. Mixing of stratified layers occurs twice a year, usually in May and October. During these periods, the water temperatures are about the same from top to bottom.

Dissolved oxygen follows a pattern similar to that of water temperatures. During periods of mixing, dissolved oxygen is relatively uniform throughout the water column. However, during the late spring and summer months when the waters are stratified, deeper waters, due to the decomposition of organic materials on the bottom, may contain inadequate amounts of dissolved oxygen to support fish. In all of the Loop lakes, reduced oxygen levels were found in deeper waters. However, this problem was of particular concern in Gull Lake where low oxygen concentrations (below 3mg/l) during the entire ice free period and the complete lack of oxygen between June through September, were found below 30 feet at Gull Lake. The lack of dissolved oxygen would have forced trout and other fish to survive in the upper 30 feet.

These conclusions are supported by data from US Geological Survey Open-File Report 95-394, which showed similar results for water temperature and dissolved oxygen.

Nutrients and Phytoplankton

The nutrients of principal concern in lakes are nitrogen and phosphorus. These elements in high concentrations can lead to algae blooms which in turn may discolor lake waters and cause negative visual impacts. Eutrophication can also occur as algae blooms use up available dissolved oxygen and suffocate other lifeforms.

The nutrient concentrations of June and Silver Lakes were low, probably the result of nutrients being consumed by floating algae. Gull Lake exhibited enhanced nutrient levels, especially as the depth increased. Higher concentrations of ammonia, another source of nitrogen usable to algae, and orthophosphorus are derived from the anaerobic decomposition of algae and detritus in the oxygen-depleted bottom waters of Gull Lake.

The growth of phytoplankton or free floating algae is related to available nutrients; higher concentrations lead to greater quantities of algae. In general, concentrations of phytoplankton were low in all lakes. The algal numbers, along with the oxygen data, indicate that Silver Lake may be slightly enriched in comparison with a lake such as Tahoe. This enrichment is important in terms of fishery habitat in that more food is available for the fish than would be found in a non-nutrient enriched lake.

These conclusions are supported by data from US Geological Survey Open-File Report 95-394, which showed similar results for nutrients and phytoplankton.

Dissolved Minerals

June, Gull and Silver Lakes all contain water of excellent mineral quality. June Lake contained the highest amount of Total Dissolved Solids (TDS), 130 mg/L. Concentrations at Gull and Silver Lakes measured 95 mg/L and under 40 mg/L, respectively. For comparison, Lake Tahoe water contains 60 mg/L, and Lake Shasta, 90-100 mg/L, while the suggested upper limit for drinking water is 500 mg/L. None of the constituents measured in any of the lakes pose a water quality problem.

These conclusions are supported by data from US Geological Survey Open-File Report 95-394, which showed similar results for dissolved minerals. Concentrations at Gull Lake ranged from 56-98 mg/L while concentrations at Silver Lake remained under 40 mg/L.

Zooplankton

Zooplankton, small animals barely visible to the unaided eye, feed on living phytoplankton and the remains of other organisms. These organisms are capable of limited movement and provide an important link in a waterbody's food chain. Populations consist of approximately equal proportions of rotifers ("wheel animals") and cladocerans ("water fleas"). Copepods (a small crustacean) were also common in all samples.

Zooplankton collected in June Lake ranged from 69 organisms/gallon to 112 organisms/gallon. Samples collected in Gull Lake ranged from 112 organisms/gallon to 592 organisms/gallon. The high number corresponds to a phytoplankton "bloom" and is probably not representative of normal population levels. Silver Lake contained relatively high concentrations of zooplankton;

two samples revealed populations of 135 and 385 organisms/gallon. The relatively large numbers of zooplankton in Silver Lake were somewhat surprising in view of the quality of water entering the lake, but they do enhance the lake's value as a fish habitat. One hundred organisms/gallon is considered more than adequate to support substantial numbers of resident trout.

Light Penetration

The depth to which light penetrates is important to the organisms inhabiting a waterbody. A device called a secchi disk is used to measure water clarity and the depth to which light penetrates. Light penetration is vital in defining the photic zone, the portion of a lake in which algalcell production (photosynthesis) exceeds consumption (respiration). The photic zone is approximately 3.5 times the secchi depth. The actual factor can be anywhere from 2.5 to 4 and has to be determined experimentally for each water body. The factor of 3.5 was assumed for this report for the three lakes.

Representative secchi depths in California range from 3 to 6 feet in the Sacramento-San Joaquin Delta, 100 feet in Lake Tahoe, and 15-25 feet in Don Pedro Reservoir (Tuolumne River).

Secchi depths in June Lake ranged from 19 feet to 40 feet. Using a factor of 3.5 (3.5 x 19=67 feet), the calculated photic depth ranged from 67 feet to 120 feet. Gull Lake secchi depths averaged about 20 feet. The photic zone, however, generally extended to the bottom indicating that low light conditions should not limit algae growth. Secchi depths and calculated photic depths in Silver Lake ranged between 14.4 feet to 22.2 feet and 50 feet to 78 feet, respectively. The average secchi depth in Silver Lake was lower than that of June or Gull Lakes (the water was more turbid or had more color) but on the average algae would be able to grow at any depth.

US Geological Survey Open-File Report 95-394 recorded secchi depths ranging from 4.6 to 29.9 for Gull Lake, depending on the location in the lake and the time of year. Higher readings were recorded in the summer months, and lower readings in the spring and fall. Secchi depths recorded by the USGS for Silver Lake ranged from 13.1 to 32.2, with the highest readings in the summer, and the lowest readings in the spring.

WATER QUALITY--CREEKS

Water sampled from Reversed Creek below Gull Lake and above the Rush Creek confluence, and from Rush Creek at the SCE powerhouse and between Grant and Silver Lakes, indicated a very low level of dissolved minerals. This supports the finding that the main surface waters of the June Lake Loop are of excellent mineral quality.

Sampling for dissolved nutrient concentrations at the same locations found low concentrations in all cases. The highest concentrations were found below Gull Lake and the lowest at Rush Creek at the powerhouse.

These conclusions are supported by data from US Geological Survey Open-File Report 95-394, which showed similar results for dissolved minerals and other water quality data at four locations on Reversed Creek, three locations on Rush Creek, and one location on Alger Creek.

GROUNDWATER QUALITY

Information about the quality of the Loop's groundwater supply is restricted to a brief analysis performed by the California Department of Water Resource during their Water Resource Assessment Study of the June Lake area in 1977 and 1978. Based on limited sampling data, the Department found the groundwater supply to be "calcium bicarbonate" in character, with a total dissolved solids (TDS) concentration ranging from 30 to 50 mg/L. These limited findings would indicate that the Loop's groundwater is of excellent quality and could, if needed, be utilized to supplement the area's surface water supply for consumptive uses.

In 1988, a groundwater test well was drilled at the Snow Creek plant to a depth of 440 feet. An inorganic water analysis conducted at that time indicated a very soft water meeting current water quality standards (JLPUD Master Plan, p. 16). That well was not completed.

SEDIMENTATION--GULL AND SILVER LAKES

U.S. Geological Survey Open-File 95-702 contains information on storage capacity, detention time, and sediment deposition characteristics for locations on Gull and Silver Lakes. The maximum storage capacity of Gull Lake is 2,400 acre-feet; Silver Lake's maximum storage capacity is 3,000 acre-feet. The flow detention time for average annual flow conditions at Gull Lake is about 2.5 years and for Silver Lake the average detention time is about 19 days.

Sediment deposition at the inlet to Silver Lake has been monitored since 1951 using aerial photography. During 1963-94, the area of sediment deposition increased from 0.32 acres to about 2.4 acres. Analyses of the sediment deposition data indicate that the rate of deposition was lower during 1963-72 than during 1983-94. These data also indicate that sediment continues to deposit at the inlet to Silver Lake.

WATER QUALITY MONITORING

The June Lake Public Utility District (JLPUD) monitors the bacteriological quality of domestic water by routinely testing for coliform bacteria. Coliform organisms are indicators of potential contamination and may originate from human, animal or soil sources. If coliform standards are met, the water is considered bacteriologically safe. The bacteriological quality of treated water distributed by the JLPUD has been found to meet the drinking water standards specified in the California Domestic Water Quality and Monitoring Regulations.

The JLPUD also performs routine sampling and analysis of its raw water sources and treated supplies to demonstrate compliance with standards set by the California Department of Health Services for general mineral, general physical, inorganic chemicals, volatile organic compounds (VOCs), and MTBE. Test results indicate compliance for all parameters analyzed.

MONO LAKE WATER RESOURCE IMPACTS

Although outside of the June Lake Planning Area, Mono Lake and its associated resources provide significant economic, recreational, scientific and scenic opportunities for residents and visitors of the June Lake area. Maintenance of a healthy environment in and around Mono Lake is of direct importance to the June Lake community.

The Los Angeles Department of Water and Power (LADWP) supplies water to the City of Los

Angeles. In the early 1900's, when local supplies could no longer support the City's anticipated needs, the City began searching for additional sources. The LADWP ultimately acquired the rights to nearly all the water tributary to the Owens River, including virtually the entire flows of Rush, Parker, Walker, and Lee Vining Creeks. At the height of LADWP's diversion program, average exports from Grant Lake were 92,668 acre-feet per year for the period 1971-72 to 1982-83.

As a result of the diversions, the level of Mono Lake dropped to 6,373 feet in 1979, approximately 43 feet below its pre-diversion level. The declining lake level and its impacts on the Mono Lake ecosystem became the focus of intense scientific research and litigation. Decision 1631, issued by the State Water Resources Control Board in 1994, set permanent streamflows for Mono Basin streams and a lake level of 6,392 feet to protect Mono Lake's public trust values, as ordered by the California Supreme Court. The Water Board also ordered the LADWP to prepare and implement plans to restore streams and waterfowl habitat damaged as a result of past diversions. The current lake level at Mono Lake is 6381.8 feet (11/02, monolake.org).

INSTREAM VALUES

Besides providing an excellent source of drinking water, the area's water resources also serve as a primary component of the natural environment.

The quality and quantity of water within local lakes and streams is especially significant to June Lake since its economy is sustained by water-oriented activities. The protection and preservation of local water resources will help maintain recreational and visual resource values, local trout fisheries, wildlife habitat, riparian vegetation and streambanks and lakeshores. Adequate flows will also help to reduce the deposition of sediments in streams and eutrophication rates or changes in the microecology of its lakes.

The anticipated renewal of community development and population growth will create an increase in domestic, municipal and fire protection water demands. To adequately meet these demands, additional supplies will need to be diverted from existing sources, if available. If unavailable, new sources will need to be located and developed.

The extraction of excessive amounts of water from local lakes, streams or groundwater basins could affect the recreational experience and scenic quality for which the June Lake Loop is well known. Retaining the Loop's excellent water quality, fish and wildlife habitat, and natural characteristics, will require a concerted planning effort between local public water purveyors and resource protection agencies, including the USFS and CDFG. The USFS, in its February 1982 report entitled **June Lake Loop - A Review Of Current Water Uses And Future Needs,** has identified several water management strategies for the June Lake Loop, many of which have already been implemented by local water purveyors. Additional recommendations presented in this document could be followed by all agencies to guarantee that consumptive and non-consumptive uses are managed in the public's best interest.

MONO COUNTY BEST MANAGEMENT PRACTICES

The Mono County Best Management Practices Manual for Erosion Control and Sedimentation contains erosion and sediment control standards for future development in Mono County; their implementation is intended to protect and improve water and air quality and to eliminate hazards to the public health, safety and welfare. The manual was developed as part of the Clean Lakes Grant Program to minimize erosion and sedimentation impacts of existing and future development throughout the county, including June Lake.

"Best Management Practices (BMPs) are resource management practices whose purpose in the context of erosion and sediment control is to maintain water and air quality and to prevent or minimize water and wind erosion. They include a variety of practices which are intended to address both short-term impacts to air and water quality, such as those resulting from construction activities, as well as long-term impacts, such as those resulting from site development and design."

(Mono County BMP Manual, p. 1)

The installation or use of BMPs is required for all development activities with the potential to adversely affect air or water quality, whether or not they require a grading permit. On-going maintenance activities, such as snow removal or road maintenance, also require the installation or use of BMPs.

The Manual contains seventeen BMPs to address short-term impacts and eight BMPs to address long-term impacts. The BMPs focus on retaining run-off and sediment on-site. See the Manual for specific details of the the BMPs.

CHAPTER 14
ENERGY RESOURCES

ENERGY RESOURCES

June Lake's primary energy resources include: hydroelectric power; liquid petroleum fuels such as gasoline, diesel fuel, propane, and butane; and wood. Limited quantities of passive solar energy are also used. Geothermal and wind resources are currently potential untapped energy sources in the Loop.

The generation of additional energy to correspond with community growth could adversely affect the Loop's environment. Wood burning devices and internal combustion engines could impact air quality, while additional hydroelectric generation facilities could have detrimental effects on streams and lakes.

ENERGY SOURCES

Electricity

Electrical power for the June Lake area is provided through facilities owned and operated by the Southern California Edison Company (SCE). Electricity in the June Lake area is used for space and water heating, lighting, air conditioning and ventilation, and for appliance and equipment operation. The primary power source is the 10 Megawatt (MW) Rush Creek Hydroelectric Plant located near Silver Lake. The plant facilities consist of a powerhouse with the impulse turbine/generator units, two penstocks, a valvehouse, flowlines, intakes, three dams and appurtenant electrical, mechanical and transmission equipment.

Besides the plant, on-demand backup and supplementary power suppliers are available through an interconnected 115 KV grid system (Figure 20). The 115 KV lines, which run through the Down Canyon, West Village and Rodeo Grounds areas, constrain adjacent land uses. SCE requires a 35 foot setback from the centerline of the duel support poles for safety and access.

Load increases related to June Mountain Ski Area expansion and community growth will necessitate the construction of new electrical distribution and substation facilities in the near future. Once the new facilities are completed, the existing station at the Rush Creek Hydroelectric Plant will serve as a standby unit.

Electrical Consumption

Peak consumption of electricity occurs during the winter when commercial and residential space and water heating demands, and demands for power to operate ski area machinery are greatest. SCE expects a 6 percent increase in electrical energy demand over the next six years. Supplies to meet this as well as long range demand projections are reportedly available and shortages are not anticipated.

SCE estimates that approximately 40 percent of the annual power production of the Rush Creek facilities may be consumed within the June Lake planning area. During the low-flow winter months, nearly all of the power may be consumed locally. The amount of power that can be generated during this period is dependent on the volume of water in storage each year and

available for release. During the high flow summer months, energy in excess of that needed within the planning area is transmitted for use outside the Loop.

Figure 20
115 KV Powerlines

Power Generation Versus Wildlife

The demand for hydroelectric power has increased in recent years as a result of a national desire to develop a more inexpensive and non-polluting energy source. While the steep average gradient of the planning area and the relatively high seasonal precipitation amounts of upper elevations provide a number of suitable conditions for small hydroelectric power development, the potential conflicts between diverting streams for power generation and maintaining instream values will likely preclude any further development. Resource agencies are concerned that generating additional hydroelectric power could reduce the amount and condition of aquatic and riparian wildlife habitat, scenic quality and water based recreation.

Liquid Petroleum Gas

Regional natural gas facilities have not been developed in the June Lake planning area. Liquid fossil fuels (e.g. propane and butane) are available from locally operated liquid petroleum gas (LPG) distributors. Fuel is delivered by truck on a regular basis to tanks located at single-family residences, condominium complexes and commercial establishments. LPG is used primarily for space and water heating and, to a lesser extent, for fueling large and small residential and commercial appliances. Only a small percentage of vehicles are equipped to operate on LPG. As with electricity, peak consumption occurs during the winter when space heating demands are greatest. Future use projections vary from company to company, ranging from 3 to 6 percent for the next five-year period. Adequate supplies to meet existing and future LPG demands are reportedly available.

Gasoline and Diesel Fuel

Within the planning area, the greatest amounts of gasoline and diesel fuel are used for powering passenger cars and trucks, recreation vehicles and heavy construction equipment and machinery. Smaller amounts are used for operating private and public electrical generating systems, off-road vehicles, outboard motors and smaller gasoline and diesel powered equipment and machinery.

Wood

Wood is used extensively for space heating and to a much lesser degree for residential water heating and cooling. Firewood is harvested from surrounding public lands by commercial firewood companies, by Mammoth and June Mountain Ski Areas, by individuals with wood gathering permits, and by individuals without permits.

Geothermal

Figure 21, from the Mono County Master Environmental Assessment (MEA), indicates that the June Lake Loop lies almost entirely within the 460,256 acre Mono-Long Valley Known Geothermal Resource Area (KGRA). A KGRA is defined as an area with higher-than-average potential for discovery of geothermal resources. The Mono-Long Valley KGRA is known to contain several fumaroles and hot springs. In addition, there are numerous locations where hydrothermal alteration is evident and many areas where heat flows prevent snow from accumulating.

Past drilling and geothermal survey work has yet to detect significant geothermal resources in the June Lake area (Dan Lyster, Mono County Energy Director). Future geothermal resource development for energy related uses in the June Lake Loop appears unlikely. Additional information on geothermal resources in the County is available in the Mono County MEA and at the US Geological Survey website, www.usgs.gov.

FIGURE 21
MONO-LONG VALLEY KNOWN GEOTHERMAL RESOURCE AREA

Solar

Limited quantities of solar energy are used in the June Lake Loop. Generally, solar usage has been limited to individual users who incorporate solar technology into the design of residential and commercial buildings or who retrofit existing structures with solar devices. Winter space heating and year-round water heating are the primary uses of solar energy. Lessening conventional energy demands while reducing the production of air pollutants are solar energy's most valuable assets.

Taking advantage of solar energy requires locating buildings in areas where solar radiation is not blocked by topography or trees. As many of June Lake's developed areas are situated on north facing slopes of greater than five to ten percent, the availability of sunlight during the winter is severely constrained. The same holds true for development on heavily wooded south facing slopes. Such locations limit solar applications and require alternative methods of energy efficient design to achieve the same level of energy use possible with passive designs in other locations. The West Village/Rodeo Grounds and the Pine Cliff areas, due to their southern exposure and unobstructed orientations, provide an opportunity to use solar energy.

Wind

The suitability of private or public lands within the June Lake planning area for wind power is not well known. There are, however, numerous areas in Mono County that the California Energy Commission has identified as areas suitable for wind turbine siting (see the Mono County MEA) and the potential to transmit that energy to other sites in the County. To economically convert wind into energy, large clusters of wind turbines are required. This creates an aesthetic concern, particularly in undeveloped open space areas.

ENERGY CONSERVATION

New buildings in the planning area must comply with building energy efficiency standards contained in Title 24 of the California Administrative Code. Both prescriptive and performance methods are provided for compliance. Prescriptive standards insure a minimum level of energy efficiency through required building design features such as insulation, caulking and weather stripping. Performance standards are allowable annual energy budgets which, if met through innovative design or use of renewable or alternative energy service, exempt the building from some prescriptive requirements. The Title 24 requirements are enforced at the local level through the building permit review process; compliance must be demonstrated prior to receiving a building permit.

CHAPTER 15
NOISE

NOISE ENVIRONMENT

The major noise sources in June Lake are car and truck traffic and general aviation traffic. Other noise sources include general commercial and residential activities and recreational activities on land and water. The average noise levels associated with motor vehicles and aircraft traffic are given in Table 17. Natural features contribute little to the sound levels in the Loop. Wind moving through the forest canopy produces noise levels of about 10 to 15 dBA[5] Other natural phenomena such as thunder, rockslides and avalanches may generate levels above 50 dBA.

Automobile and Truck Noise

Noise associated with traffic depends on the time of day, the number of vehicles present and the roadway characteristics such as road surface, grade, speed limit, and size and type of surrounding noise buffers. In the June Lake area, heavily used roadways, including U.S. 395 and S.R. 158, are the major continuous sources of noise levels of 60 dBA or higher. Figures 22 and 23, developed as part of a 1981 noise study conducted by Mono County, show noise levels along sections of S.R. 158. The highest recorded levels, up to 70 dBA, occurred along sections of S.R. 158 between its intersection with north and South Lakeview Drive, in the central business district. While studies to determine noise levels in adjacent residential and commercial areas have not been conducted, it is assumed, based on similar Caltrans studies conducted in Mammoth Lakes, that ambient noise levels are less than 55 dB, a level considered generally acceptable for residential and commercial uses.

Aircraft Noise

There are two airports located near the June Lake planning area. The Lee Vining Airport, located approximately four miles north of the Loop, is a general aviation, non-commercial facility.

> (*At Lee Vining Airport...*) Aviation facilities include the airfield area (one paved runway and approaches) and the terminal area (3 privately owned hangars, a 90' x 300' asphalt aircraft parking apron accommodating 7 tiedown spaces, a runway/apron taxiway, and a short paved access road connecting the gravel entrance road with the apron.
>
> The airport currently serves single and twin-engine aircraft, as well as occasional turboprops. One aircraft is currently based at the airport; the total is expected to increase to 4 by the year 2010. Annual runway operations are expected to increase from 2,000 to 2,667 by the year

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[5] Decibel (dB) --Environmental noise is measured in units of decibels (dB), on a logarithmic scale. The dBA, or A-weighted decibel, refers to a scale of noise measurement that approximates the range of sensitivity of the human ear to sound of different frequencies. The normal range of hearing extends from about 3 dBA to about 140 dBA. A 10-dBA increase in the level of a continuous noise represents a perceived doubling of loudness, a 3-dBA increase is barely noticeable to most people outside of a laboratory setting. Environmental noise fluctuates in intensity over time, and is typically described as a time-averaged noise level.

2020. Additional facilities and the reconstruction of existing facilities (i.e. lengthening the runway) will be necessary to meet increasing aviation demand.
(Airport Land Use Compatibility Plan-Lee Vining Airport, Draft, p. 6)

TABLE 17
Average Noise Level Emitted, Motor Vehicles and Aircraft

Motor Vehicles (from 50 feet)	Decibels	Aircraft (from 1000 feet)	Decibels
Standard Sedan	64-76	Single Engine Prop	72-85
Compact Car	70-80	Multi Engine Prop	75-86
Sports Car	70-87	Commercial Prop	79-87
Pick-up Truck	70-85	Executive Jet	84-95
2-3 axle Truck	80-89	Turbine Light Utility	
4-5 axle Truck	85-95	Helicopter	69
Bus	70-87		
Motorcycle (≤350cc)	64-85		
Motorcycle (>350cc)	74-95		
Trail Bike	80-105		
Snowmobile	70-105		
Outboard Power Boat	65-90		
Inboard Power Boat	75-105		
Chainsaw	72-82		

Source: Mono County MEA 2001, Table 43.

Mammoth Yosemite Airport is located 20 miles to the south. The airport has approximately 40 based aircraft and serves approximately 6,000 annual operations (Mammoth Yosemite Airport Expansion Project Draft Environmental Assessment, p. I-1).

The distance between the Loop's residential and commercial centers and established flight paths ensures that neither airport contributes substantially to the ambient noise levels in June Lake. In addition to aircraft noise, the June Lake community is occasionally subjected to noise from helicopter use during ski lift construction work at June Mountain, and repair and improvement projects at the Rush Creek Hydroelectric Plant facilities. Occasional helicopter noise also occurs during mountain rescue flights, many of which originate from the June Mountain Ski Area parking lot.

COMMUNITY NOISE SURVEY--BASELINE 1980-1981 STUDY

Prior to 1987, the State Noise Element guidelines required the quantification of noise exposure levels to be presented in terms of day-night average level (Ldn) noise contours[6]. Due to the

[6]Noise Contours are lines drawn about a noise source indicating constant levels of noise exposure. It is best to think of noise contours not as absolute bands of demarcation but as bands

unreliability of modeling techniques for low volume roadways, staff conducted a noise monitoring field survey for each of the community areas within the County. During the fall of 1980 and the winter and spring of 1981, a community noise analyzer was leased from the U.S. Environmental Protection Agency to accomplish this task. Approximately thirty noise monitoring sites located throughout the County were selected. Noise sensitive land uses, as well as several key sites along major thoroughfares, were each monitored for three consecutive 8 hour periods (early: 6 A.M. to 2 P.M., mid-day: 2 P.M. to 10 P.M., and late: 10 P. M. to 6 A.M.). All other locations were monitored for three 30 minute periods during the early part of the day, mid-day and late in the day. The equivalent energy level (Leq) for each period was computed by the Community Noise Analyzer. The Ldn was then calculated using the Sound Exposure Level (SEL) program and plugging in the Leq readings as follows:

X= 6 A.M. - 2 P.M.
Y= 2 P.M. - 10 P.M.
Z= 10 P.M. - 6 P.M.

$$Ldn = 7\ Leq\ (X) + 8\ Leq\ (Y) + 9\ Leq\ (Z + 10)$$

The results of the noise survey are on file at the Mono County Planning Department. Once the Ldn for each location was calculated, that information was plotted on community scale maps and adjusted to represent the 60 Ldn, 65 Ldn and, where applicable, the 70 Ldn noise contours using the alteration curve based upon the Federal Highway Administration's Highway Traffic Noise Prediction Model (i.e. RD-77-108 for "infinite" roadways).

As illustrated in Figures 22 and 23, the 60 dB contours in June Lake are within 300 feet of the travelled way. Ldn calculations provided by Caltrans for state and federal highways utilizing 1995 traffic flow data indicate that current traffic-related noise impacts have not changed substantially from the 1980-81 baseline study. The noise contours plotted in 1981 are still assumed to be valid.

COMMUNITY NOISE SURVEY--1996 UPDATE

In 1996, staff completed a Noise and Traffic Study that included the following elements:

- A noise monitoring and traffic count field survey on county roads within each of the community areas in the County.
- Ldn calculations provided by Caltrans staff for state and federal highways based on current traffic flow data

County Roads

In the spring and summer of 1996, staff conducted a noise monitoring and traffic count field survey on county roads within each of the communities in the County. The purpose of the survey was to determine ambient noise levels on county roadways during peak use periods. Traffic counts were measured over a 24-hour period utilizing a manual traffic counter installed at the monitoring site. Noise measurements were taken for 15 minute periods in the morning and the afternoon utilizing a hand held noise meter recording dBA's at 10 second intervals. Most readings were taken around the Memorial Day weekend when traffic was heavy and would

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or similar noise exposure. CNEL and Ldn (see previous footnotes) are the metrics utilized to describe community exposure to noise.

represent a peak use scenario. Noise monitoring data collected in the field were converted to an Leq reading (an average of the dBA data). The complete results of the noise monitoring and traffic count field survey are shown in Table 45 in the Mono County MEA. In June Lake, traffic counts and noise levels were measured at Leonard Avenue. The noise level there was 63 dB.

State and Federal Highways

Ldn contours for state and local highways were provided by Caltrans. Calculations were based on current (1995) traffic flow data and were not checked against actual field data. The results of these calculations show that traffic-related noise impacts along state and federal highways varied little from the baseline data collected in 1980-1981. Traffic volumes along these highways were, in general, lower in 1995 than in 1990, indicating that noise impacts would also be lower. As a result, it is assumed that the 1980-81 noise contours represent current conditions along state and federal highways.

PROJECTED FUTURE NOISE ENVIRONMENT

June Lake's future noise environment will be determined by changes in the operational activity of existing noise sources, by the expansion of existing sources, and by the development of new noise sources. The greatest potential increase in operations activity is assumed to be in traffic volumes. Although traffic volumes on SR 158 in June Lake increased 7 percent between 1989 and 1998, from 1,350 to 1,450 annual average daily traffic, it is difficult to project future traffic volumes (Mono County MEA 2001, p. 223). Even a substantial increase in traffic, however, is not expected to produce a significant increase in noise impacts. A 62 percent increase in operational activity is only expected to produce an increase of 2-dB (10 log 1/.62) and an increase of 22-38 percent would result in a 1-dB increase. Since noise readings are known to vary from 1 to 2-dB and a 1-dB increase is only expected to result in a 2 percent shift in the number of people highly annoyed due to excessive noise exposure.

FIGURE 22
JUNE LAKE VILLAGE NOISE CONTOURS

FIGURE 23
DOWN CANYON NOISE CONTOURS

Construction Activities

Building, utility, road and other construction related activities in the June Lake planning area normally occur during the summer season only. While often temporary in nature, these sources of noise are nonetheless intrusive and annoying, especially to persons residing or doing business at adjoining properties. The direct use of power tools, heavy equipment and machinery generates noise levels of up to 105 dBA at 50 feet (Bolt, Beranek, and Newman, 1971).

Other Noise Sources

Other noise sources in the June Lake Loop stem from the continuous operations of turbines at the Rush Creek Hydroelectric Plant near Silver Lake, intermittent operations of commercial and private firewood processing equipment, outboard and inboard motors and off-road recreational vehicles, primarily motorcycles and snowmobiles. These sources generally cause an increase in ambient noise levels where there are concentrations of buildings and people.

NOISE SENSITIVE AREAS

Noise sensitive receptors include schools, hospitals, residential areas, and certain open space areas. Certain open space areas, because of their use for various recreational pursuits or their value as wildlife habitat or wilderness areas, are also noise sensitive areas. The US Forest Service considers all wilderness, scenic and roadless areas within the Inyo National Forest to be sensitive to excessive noise levels. Though not considered sensitive receptors, visitors to and recreational users of the Loop, expecting a quiet, mountain experience, can also be adversely affected by noise levels exceeding background levels.

REGULATION OF THE NOISE ENVIRONMENT

Noise emissions are currently regulated in several ways. The County Noise Ordinance (Chapter 10.16 of the County Code) regulates noise. The Chief Building Inspector is designated as the Noise Control Officer for the County and is empowered to enforce those regulations. The Planning and Energy Departments have the ability to regulate noise generating land use activities through their permit processes, which allow the Departments to impose conditions of operation and to set limits for noise emissions.

The Sheriff's Department, along with the California Highway Patrol, enforces code provisions in the State Motor Vehicle Code and the Harbors and Navigation Code which pertain to noise. Section 38365A of the State Vehicle Code requires that O.R.V.'s must be equipped with a muffler to reduce noise to an acceptable level; Section 38370 defines acceptable noise levels according to the age of the vehicle (i.e. pre-1973 ninety-two decibels, 1973 and 1974 eighty-eight decibels, and post-1974 eighty-six decibels).

Traffic, including air traffic, is the most significant source of environmental noise in Mono County, including June Lake. An important part of planning for a healthful environment is the avoidance of unnecessary transportation noise. The Circulation Element of the General Plan includes policies intended to reduce congestion and keep traffic flowing smoothly, thereby helping lower expected future noise levels. The Airport Land Use Compatibility plans for airports in the County include policies to regulate noise at those facilities (see Figure 24).

State of California airport noise standards, as well as Federal Aviation Regulations, establish a CNEL of 65 dBA as the maximum acceptable noise exposure for residential land uses. This

criterion, however, is set primarily with regard to air carrier airports in urban locations. For general aviation airports located in comparatively quiet rural settings such as Mono County, a 60 or even 55 CNEL standard is suggested.

The Land Use Element of the General Plan contains policies to avoid the juxtaposition of incompatible land uses unless potentially significant impacts (such as noise impacts) are adequately mitigated. Noise impacts resulting from adjacent incompatible land uses are not currently a major problem in the County. Noise receptors are generally located in community areas; aside from highway noise, noise sources are generally located away from community areas. In some cases, however, noise does carries a great distance due to the local topography and wind currents. As a result, there is a need to ensure that off-site noise impacts will not significantly impact sensitive noise receptors. Also, since much of the land in the County is used for recreational purposes, noise sources such as geothermal and mining development which are located away from community areas may still have a significant impact on land use in the project vicinity.

The Noise Element of the General Plan contains policies to avoid the juxtaposition of incompatible land uses unless potentially significant impacts (such as noise impacts) are adequately mitigated, to enforce existing noise ordinances and policies, and to assess and mitigate the impacts of proposed noise generating land uses.

FIGURE 24
LAND USE COMPATIBILITY FOR COMMUNITY NOISE ENVIRONMENTS

CHAPTER 16
BIOLOGICAL RESOURCES

VEGETATION

The strikingly complex and varied vegetation pattern of the June Lake planning area plays a significant role in attracting residents and visitors to the Loop. This vegetative mosaic includes: forest lands used for recreation; riparian meadows and shrublands that provide food and cover for a variety of wildlife; grazing lands; and lands valued for their high scenic appeal. Vegetation also fulfills many other roles such as water cleaning, soil stabilization, nutrient entrainment and release, and erosion control.

The diversity of vegetative types within the planning area reflects a substantial range of geographic conditions and biotic factors. Plant communities range from those existing in dry desert conditions to those with high precipitation and/or moisture requirements. A variety of sources including aerial photographs, interviews with United States Forest Service (USFS) and California Department of Fish and Game (CDFG) personnel, California Wildlife Habitat Relationships Program publications and on-site field surveying and mapping were utilized in identifying the plant communities existing in the Loop.

NATURAL PLANT COMMUNITIES

Nine principal plant communities were defined based on either the dominant plant species of the community or frequently associated plant species. While by no means exhaustive, the following plant community inventory provides a relatively accurate description of biological conditions and indicator species common to each. Figure 25 shows potential wetland areas, the most important and environmentally sensitive plant communities. Marshlands and the Open-Grass Meadow communities are shown as meadow areas, and Riparian Woodland-Meadow and the Mixed Riparian communities are depicted as riparian woodland areas in Figure 25.

The following document includes species lists of all plants encountered in specific areas of the June Lake planning area:

- **June Lake Avalanche By-Pass Road Environmental Impact Report/Environmental Assessment** (Mono County Planning Department et. al.). Appendix A contains a list of all plants encountered within the project study area for the avalanche by-pass road, North Shore Drive.

Marshlands

June Lake's marshland communities are limited both in size and distribution. The three largest communities are located along the southern edges of June and Gull Lakes and at the south end of Silver Lake bordering Rush Creek. The predominant plant species are sedges (Carex spp.; Scirpus spp.) and rushes (Juncus spp.). Willow (Salix spp.) and quaking aspen (Populus tremuloides) are typically found along marshland edges.

Open-Grass Meadow

The open-grass meadow community contains many combinations of low growing herb and grass species that thrive on flat, poorly drained areas adjacent to streams, lakes, springs, seeps and

other water drainages. Favorable areas have water at or very near the surface throughout the entire year. Plants typical of this category include needlegrass (Stipa spp.), bluegrass (Poa spp.), squirrel tail (Sitanion hystrix), bromegrass (Bromus rigides), wheatgrass (Agropyron spp.), reedgrass (Calamagrostic spp.) and fescue (Festuca spp.).

The largest expanses of open-grass meadow communities are located between S.R. 158 and Nevada Street in the south Silver Lake area and to the southwest of Gull Lake within and adjacent to the Rodeo Meadows area.

Riparian Woodland - Meadow

This plant community is comprised of moisture-tolerant plants that grow on lands that tend to be somewhat drier than the open-grass meadow community. Although a drier condition is apparent, the water table is usually at or very near the surface throughout much of the year. Plant species include many of the grasses found in the open grass-meadow as well as willow, quaking aspen, lodgepole pine and undifferentiated forbs. The largest riparian woodland-meadow community occurs along S.R. 158 between the Reversed Creek outlet at Gull Lake and the eastern boundary of Silver Lake Pines Tract #2.

The vegetation in the marshland, open-grass meadow and riparian woodland-meadow communities is integral to the protection and maintenance of fish, wildlife and water quality within the Loop. Its dense and nutritious foliage serves as an excellent source of cover and food for numerous wildlife species; overhanging branches and leaves along streambanks and lakeshores provide shade which helps maintain favorable water temperatures for aquatic animals; root systems stabilize streambank and lakeshore soils, lessening erosion and surface water sedimentation; and meadow grasses filter solids from natural and man-caused run-off, preventing direct untreated discharge into surface water sources.

Mixed-Riparian

The mixed-riparian plant community - found growing along the shores and edges of the Loop's numerous lakes and streams - includes a mix of broadleaf trees, conifers, willows, forbs and grasses. In some instances the different plants are mixed, with no one species being dominant, while in other instances, pure stands exist. Species found most frequently include: quaking aspen, mountain alder (Alnus tenuifolia), cottonwood (Populus trichocorpa), jeffrey pine (Pinus jeffreyi), lodgepole pine (Pinus murrayana), willow, and numerous undifferentiated grasses, sedges, rushes and forbs.

Juniper-Pine Scrub

Plants common to this community thrive in rocky thin soil on hillsides and in escarpment areas. Vegetation is comprised of a mixture of shrubs: great basin sagebrush (Artemisia tridentata), antelope bitterbrush (Purshia tridentata), curlleaf mountain mahogany (Cercocarpus ledifolius), tobacco brush (Ceonothus velutinus), manzanita (Arctostaphylos patula), snowberry (Symphoricarpos vaccinoides), western juniper (Juniperus occidentalis), and small usually sparse stands of jeffrey pine (Pinus jeffreyi). Lands bordering the northwest side of June Lake, the west side of Gull Lake and the east side of Silver Lake exemplify this vegetation type.

Sagebrush - Bitterbrush Shrub

The sagebrush-bitterbrush shrub community, often referred to as Big Sagebrush Scrub, is the most widespread and prolific of the vegetation types occurring in the planning area. Plants exist on coarse, dry, well drained soils at lower elevations, on large openings in the forest canopy and occasionally on small flats and open mountain slopes. Plants tend to be widely spaced with grasses and forbs forming a sparse but characteristic understory between the larger shrubs. Coniferous trees may comprise up to 10 percent of the vegetative cover.

Primary indicator species for this vegetation type are great basin sagebrush (Artemisia tridentata) and antelope bitterbrush (Purshia tridentata). Other species commonly occurring in this vegetation type include rabbitbrush (Chrysothamnus decidoforus), desert peach (Prunus andersonii), sulphur flower (Eriogonum umbellatum), many perennial grasses (most commonly Achnatherum nevadensis, A. occidentalis, Elymus elymoides, Hesperostipa comata, and Leymus triticoides), sedges (Carex rossii, C. douglasii), and other annual grasses and forbs.

Much of the land west of U.S. 395 between the north and south junction with S.R. 158, and lands east of Grant Lake, are covered by plant species typical of this community.

Jeffrey Pine - Bitterbrush, Sagebrush Shrub

In the Jeffrey Pine-Bitterbrush, Sagebrush shrub vegetation community the dominant overstory indicator species is Jeffrey Pine (Pinus jeffreyi). Antelope bitterbrush, the principal shrub, great-basin sagebrush and undifferentiated grasses and forbs similar to those of the sagebrush-bitterbrush shrub community are found in the understory where sunlight penetrates to the forest floor. Lands bordering the south side of S.R. 158 between the south June Lake junction and the Oh! Ridge campground turn-off are characteristic of this community.

Lodgepole Pine

Lodgepole pine (Pinus murrayana) can be found in pure stands or in mixed stands principally with red fir, white fir and jeffrey pine. At lower elevations, lodgepole pine associates freely with quaking aspen and willow along riparian and meadow zones where soils are poorly or imperfectly drained. At higher elevations it often occupies dry rocky sites.

Mixed Coniferous-Fir

The Mixed Coniferous-Fir plant community covers a great portion of the lands on and around Reversed Peak as well as the steep north facing slopes between Oh! Ridge and Carson Peak. Overstory species include jeffrey pine (Pinus jeffreyi), lodgepole pine (Pinus murrayana), white fir (Abies concolor), red fir (Abies magnifica), mountain hemlock (Tsuga mertensiana), and western white pine (Pinus monticoli). Understory vegetation may include species such as tobacco brush (Ceanothus velutinus), bitter cherry (Prunus emarginata), green leaf manzanita (Arctostaphylos patula) and snowbush (Ceanothus cordulatus).

SPECIES OF IMPORTANCE

The following plant species, while not distinguished as separate plant communities, are common species in the area.

Aspen

Aspen can be found growing in a variety of areas that appear different in many respects. Aspen frequently grows along or adjacent to streams and lakes, along drainage channels which course down mountainsides and in fairly large groves among conifers at higher elevations. Aspen is generally associated with ground moisture: either a high water table, a drainage channel or hillside spring.

Pinyon Pine

Extensive stands of Pinyon Pine were not found in the June Lake study area. The largest single stand occurs on the east-facing slope near the Rush Creek inlet to Grant Lake. Plants in this community thrive on steep, rocky, thin soiled escarpment areas. The lack of understory variety is

believed to be the result of three factors: the tree may use most of the available water; its branches may shade the understory; and it yields a resin poisonous to most other plants.

FIGURE 25
POTENTIAL WETLAND AREAS

SPECIAL STATUS SPECIES

State and/or federally listed rare, threatened, endangered and sensitive plant species known to occur in the planning area were determined through the review of numerous reports and data files. The only special status species identified as occurring in the June Lake planning area was Mono Milk Vetch (*Astralagus monoensis* = *A. m.* var. *monoensis*). The following excerpt from the **2000 California Department of Fish and Game (CDFG) Annual Report on the Status of California's Threatened and Endangered Plants and Animals** (see www.dfg.ca.gov) provides information on the status of the Mono Milk Vetch:

Mono Milk Vetch (*Astralagus monoensis* = *A. m.* var. *monoensis*)
California listing: Rare (listed in July 1982)
Federal listing: None
General Habitat: Great Basin Scrub

Mono milk-vetch is a small, prostrate, grayish perennial herb in the pea family (Fabaceae), with white to pale pink flowers in small clusters and curved, papery pods. Plants are covered by soft hairs and have leaves divided into several folded leaflets. This species is endemic to sagebrush scrub and Jeffrey pine-lodgepole pine forests of northern Mono County where it occurs on pumice flats in ashy to sandy soil. Most sites are located within the Inyo National Forest or on BLM land.

There are approximately 25 known Mono milk-vetch occurrences, five of which occur on BLM land. Some sites are threatened by livestock grazing, however BLM manages grazing to avoid impacts to the species on its land. Researchers have stated that destruction of ground-dwelling bee pollinators by grazing animals could result in reduced reproduction levels for this species. OHV use has degraded habitat at some sites.

The status in 1999 of Mono milk-vetch: Stable to declining.

WILDLIFE HABITAT AND WILDLIFE

The extensive and diverse range of natural habitats occurring in the June Lake Loop planning area support a magnificent and abundant variety of wildlife. The myriad of animal species along with the habitats they occupy contribute significantly to the aesthetic, recreational and scientific values of the area, and play an integral part in sustaining the overall health of the area's economy.

Materials from the California Department of Fish and Game, the United States Fish and Wildlife Service, the US Forest Service and Southern California Edison were used to prepare this section.

EXISTING CONDITIONS

Past and present land uses in the June Lake area have negatively altered wildlife habitats. Human influences that have the potential to alter wildlife habitats include: replacement of existing vegetation with structures and other facilities, increased human usage of lands surrounding community and recreation areas, sheep grazing and water diversions.

<u>Development and Increased Use</u>

Development replaces existing vegetation and impacts conditions that support native wildlife in and around community areas. Wildlife species residing in areas adjacent to disturbed areas that are sensitive to human disturbances have been displaced. Concentrated recreational usage around lakeshores and streamside areas and at other recreational facilities has also resulted in environmental impacts. Anticipated future growth in previously undeveloped areas and associated influxes of visitors are expected to cause additional environmental damage.

Community and recreational development activities can also adversely impact fish habitat. Short-term and long-term degradation of surface water quality had been attributed to development projects where run-off from disturbed and unprotected soils was inadequately controlled and treated prior to stream discharge. Improved access to recreation sites along lakes and streams tends to result in trampled riparian vegetation, compacted soils, eroded stream banks and increased stream channel sedimentation, all of which are detrimental to fish habitat.

Grazing

Sheep grazing in areas adjacent to the Loop occurs on lands owned or managed by the Los Angeles Department of Water and Power, the Forest Service, and the Bureau of Land Management. While grazing is not permitted in developed recreation areas, a significant amount is allowed on Rush Creek below Grant Lake and on Parker Bench west of Grant Lake. Both areas are considered important spring and summer deer ranges.

The habitat needs of the mule deer population conflict with sheep use of the summer range. Because sheep trample vegetation and damage stream banks, grazing often results in the loss of important protective cover for young fawns and forage for lactating does. In addition, sheep herded into or through established deer summer ranges can cause additional competition for food, water, shade and resting sites. Competition with sheep has also resulted in the loss of deer through forced migration to acceptable ranges outside the area.

Mule deer are not the only wildlife species affected by current sheep grazing practices. Other riparian dependent wildlife such as amphibians and reptiles, predatory birds, and various small and large herbivorous and carnivorous mammals are also affected when riparian habitat is damaged or destroyed. Grazing in riparian areas often results in a significant loss of vegetation with subsequent increases in sediment loads during snowmelt, rainstorms and high stream flow periods. Fish habitat is also damaged by grazing animals collapsing undercut banks and trampling spawning areas.

Protecting wildlife species that are in direct conflict or competition with sheep will require the implementation of mitigation measures (e.g., herding, fencing, developing alternative water sources) by the responsible agencies on whose lands grazing occurs.

Water Diversions for Export and Hydroelectric Power Generation

The Loop's lakes and streams are considered to be in fair to good condition. Besides grazing and uncontrolled runoff from development, water diversions for domestic use and energy production have caused the greatest impacts on water bodies. Water diversions affect trout fisheries and other aquatic resources, including riparian vegetation, when operational practices result in significant stream flow reductions, fluctuations, or dewatering. Within the Loop, the June Lake Public Utility District and the June Mountain Ski Area are the principal licensed diverters of water for domestic consumption. These diversions cause stream flow reductions and lake level fluctuations in surface waters tributary to Rush Creek.

Since 1941, water from Rush, Parker, Walker, and Lee Vining Creeks has been diverted to supply the City of Los Angeles with water and hydroelectric power. Los Angeles Department of Water

and Power (LADWP) diversions historically affected Parker, Walker and Lee Vining Creeks below their junctures with the Lee Vining-Grant Lake Aqueduct, and Rush Creek both above and below Grant Lake which is a LADWP reservoir. Stream flows to lower Parker and Walker Creeks were completely curtailed except for occasional releases for irrigation, leading to the loss of approximately 42% of the riparian corridors outside of the Wilderness Area along both Parker and Walker Creeks.

Rush Creek has been damaged by both water diversions and the regulation of water flows for hydroelectric power generation. These occurrences have resulted in the loss of 75 % of the pre-1900 riparian corridor along Rush Creek outside of the Wilderness boundary. In 1926, after the construction of the Waugh Lake, Gem Lake, and Agnew Lake reservoirs, and the subsequent regulation of flows between them, the normal flow regime of the upper Rush Creek drainage was eliminated. Water released from the powerhouse, in combination with flows from tributary drainages and releases over the spillway or from the discharge pipes at Agnew Lake, however, appear sufficient to maintain the established fish habitat in Rush Creek, above Silver Lake.

At its inlet to Grant Lake, Rush Creek's productive capability may be reduced due to fluctuating water levels in Grant Lake. Below the Grant Lake Dam, recent court decisions have mandated that the LADWP provide Lower Rush Creek with a minimum flow of 19 cubic feet/second (cfs). Greater amounts may be required depending on the amount of drainage from adjoining watersheds and on Mono Lake's water level. Guaranteed minimum flows and required restoration work along Mono Lake's tributary streams are allowing riparian corridors along Lower Rush Creek to regenerate.

HABITAT TYPES

The protection and restoration of natural ecosystems is a key element in preserving and/or restoring the existence of wildlife species. A vast array of vegetative components and physical and biological factors serve to meet the specific needs of individual species. The distinct and subtle variations in the associations, abundance, successional stages and distributions of vegetation affect the capability of habitats to support wildlife. The presence of certain physical features such as snags, downed logs, cliffs and rock outcroppings are also of significant importance.

Riparian

The riparian environment found along and adjacent to the Loop's lakes, creeks, and streams constitutes one of the most ecologically significant wildlife habitats in the planning area. Situated in what is otherwise an arid landscape, riparian habitats offer wildlife readily available sources of water and vegetation used for drinking, cooling, food, cover and nesting. Riparian habitats also benefit wildlife as they provide vital components in close proximity, reducing the need for animals to travel. Small and large mammals, birds, waterfowl, reptiles and amphibians are common species that depend on this habitat.

Wet Meadows

Wet meadow habitat occurs on level or gently sloping areas adjacent to perennial springs, streams or lakes and in wet swales. Meadows provide water and herbaceous forage essential for pregnant and lactating does. Large aspen groves, which are often associated with wet meadows, provide excellent escape, hiding and thermal cover, as well as shade during the summer.

Marshlands

The limited land area covered by marshlands makes these habitats especially important for waterfowl and other non-game birds and mammals that depend on its productive aquatic and semi-aquatic vegetation for food and shelter, breeding, nesting, and refuge. Marshlands also provide the required breeding habitat for various invertebrates and amphibians which are an important food source for wading birds.

Grasslands (Dry Meadows)

Grasslands are found on relatively dry sites interspersed with some mixing of other cover types. Grasses and forbs are abundant and provide an important source of food for small mammals, birds and deer. Mice and burrowing rodents are often abundant, making meadows a favorite hunting ground for predatory birds and certain carnivorous mammals. Overstory vegetation provides nesting habitat for smaller birds.

Bitterbrush - Sagebrush Shrub

The habitat exemplified by these co-dominant shrubs provides good browsing for mule deer bitterbrush being the highly preferred browse species. Vegetation also provides cover and forage value for upland harvest species with population densities being highly dependent upon the degree of cover. Shrubs provide both food and shelter for numerous small birds and mammals, and understory grasses and forbs supply abundant green vegetation and seeds depending on the time of the year.

Juniper - Pine - Shrub

The juniper-pine-shrub habitat, a valuable area to many upland game species, exists on steeply sloping mountain uplands and along ridge tops with rock outcroppings. Plant types common to this habitat provide both browse and cover. Prominent browse species are bitterbrush, tobacco brush and snow berry. Dense pockets of curlleaf mountain mahogany, in association with other shrubs, also provide excellent hiding cover for mule deer fawns.

Mixed - Conifer

The composition of wildlife occupying this habitat type varies considerably depending on tree density and size, amount and variety of understory vegetation and proximity to water. Mixed coniferous and riparian habitat associations (riparian woodlands) often contain a diversity of plant species that provide excellent deer fawning and fawn raising habitat. Herbaceous forage growing along the riparian zone is essential for pregnant and lactating does. Areas of dense vegetation consisting of aspen, snow berry, bitter berry and taller grass species also offer excellent fawn hiding cover.

Edge Habitat

Large quantities of potential food, cover or water in the June Lake Planning Area may go unused because they are distant from other requirements. Wildlife habitat must contain vital components within a relatively small area. This complexity of habitat requirements creates the "edge effect," the phenomenon that makes areas where habitat types converge more favorable than either habitat alone. In edge areas, both the number of animal species and the total biomass will be greater than in any comparable area contained wholly within one or the other type. Two "edges" common to the planning area are the meadow "edge" and the forest-shrub "edge". The former is an important hunting area for carnivorous mammals. The latter is of significant value to mule deer as it provides both the forage benefits of the range and the cover benefits of the forest.

HABITAT PROTECTION

The continued long term existence of June Lake's abundant and diverse fish and wildlife populations will depend on how well life-supporting habitats are protected and maintained. The protection and preservation of critically important habitat types, such as riparian areas, will require special consideration. To assist community and county planning officials in achieving this goal, a system of categorizing local wildlife habitats based on their relative values has been developed (Table 18). These habitat designations are similar to those developed by Taylor, in his 1987 CDFG report entitled **June Mountain Wildlife Study**. These designations include general recommendations aimed at maintaining and enhancing local wildlife resources.

TABLE 18 WILDLIFE HABITAT DESIGNATIONS

CLASS I	
Definition:	Recognized as critical, highly localized wildlife habitat. Disturbance could cause irreversible impacts to habitat types and associated wildlife species.
Habitat Types:	Riparian, meadow and marshland; deer fawning grounds and major deer migration corridors; threatened, endangered and sensitive species habitat.
CLASS II	
Definition:	Recognized as critical habitat containing a complex mosaic of vegetation types. Because this habitat is more abundant, it is more negotiable for mitigation.
Habitat Types:	Grasslands, Juniper-Pine-Shrub, Mixed Conifer.
CLASS III	
Definition:	Recognized as abundant and homogeneous habitat, therefore slightly lower in species diversity. First priority for development due to minimal impacts.
Habitat Types:	Bitterbrush - Sagebrush Shrub.

WILDLIFE

The June Lake Loop Planning Area contains a diverse variety of animal life including deer, mountain lion, bobcat, coyote, jackrabbit, squirrel, sage grouse, owl and trout. Many species of reptiles and amphibians are also abundant. This valuable resource provides a major attraction for recreational users of the area.

A review of the California Wildlife Habitat Relationship Program[7] for the Northeast Interior Zone indicates that some 69 species of mammals, 168 species of birds and 18 species of

[7] A cooperative listing effort by the US Forest Service, Bureau of Land Management, California Department of Fish and Game, and the Nevada Department of Wildlife.

amphibians and reptiles may occupy one or more of the planning area habitat types during some stage of their life cycle.

SPECIAL STATUS SPECIES

State and/or federally listed rare, threatened, endangered and sensitive wildlife species known to occur in the planning area were determined through the review of numerous reports and data files. Special status species identified as occurring in the June Lake planning area include the following:

California Bighorn Sheep (*Ovis canadensis californiana*)	State listed as Endangered
Sierra Nevada Red Fox (*Vulpes vulpes necator*)	State listed as Threatened
Wolverine (*Gulo gulo*)	State listed as Threatened
Owens Tui Chub (*Gila bicolor snyderi*)	State and Federal listed as Endangered
American Peregrine Falcon (*Falco peregrinus anatum*)	State listed as Endangered
Bald Eagle (*Haliaeetus leucoccephalus*)	State and Federal listed as Endangered
Swainson's Hawk (*Buteo swainsoni*)	State listed as Threatened

The following excerpts from the **2000 California Department of Fish and Game (CDFG) Annual Report on the Status of California's Threatened and Endangered Plants and Animals** (see www.dfg.ca.gov) provides information on the status of threatened and endangered wildlife species in the June Lake planning area:

Sierra Nevada red fox (*Vulpes vulpes necator*)
California listing: Threatened (listed in 1980)
Federal listing: None
General Habitat: Many High Elevation Habitats

The Sierra Nevada red fox is one of 10 recognized North American subspecies of Vulpes. The Sierra Nevada red fox is distinguished from members of the introduced lowland population of red foxes by its slightly smaller size and darker colored fur. They inhabit remote areas of the State where chance encounters with humans are uncommon. Relatively little is known of the life history of the Sierra Nevada red fox, but it is assumed that its habits are similar to those of other red foxes insofar as choice of dens, hunting tactics, and breeding behavior are concerned. The subspecies is known to inhabit vegetation types similar to those used by the marten and wolverine. Preferred habitat for the Sierra Nevada red fox appears to be red fir and lodgepole pine forests in the subalpine zone and alpine fell-fields of the Sierra Nevada. Threats to the Sierra Nevada red fox are unknown.

The status in 1999 of the Sierra Nevada red fox: Unknown.

Wolverine (*Gulo gulo*)
California listing: Threatened (listed in 1971); Fully Protected
Federal listing: None
General Habitat: Various High Elevation Habitats

The wolverine resembles a small, short-legged bear with a coarse shaggy coat and a bushy tail. Wolverines subsist on a variety of foods including small- and medium-sized mammals, birds, insects, berries, and fungi. Carrion, especially in the form of large ungulates, is

believed to be an important component of the diet, particularly during winter. Wolverines are often regarded as animals of high-elevation habitats; however, sightings collected by the DFG over the past several decades indicate that the species inhabits a variety of habitat types within an elevation range between 1,600 feet and 14,200 feet. Habitat generally consists of open terrain above timberline. The present and historical ranges of the species are rather similar. The historic range encompassed an area from Mount Shasta south to Monache Meadows in Tulare County. Portions of the north coast and the northern Sierra Nevada regions of the State are also included in the historical range. No population density data are available on the wolverine in the State due to difficulties involved in studying such an elusive and far-ranging species. Specific threats to the wolverine are unknown..

The status in 1999 of the wolverine: Unknown.

California (Sierra Nevada) bighorn sheep (*Ovis canadensis californiana*)

California listing: Threatened (1971), Endangered (1999)
Federal listing: Endangered (2000)
General Habitat: Eastern Slopes of Sierra Nevada - from Alpine Zones down to Great Basin Scrub

The California bighorn sheep is one of two mountain sheep subspecies found in California and one of eight found in North America. Two native populations and three reintroduced populations of California bighorn exist in the eastern slopes of the Sierra Nevada Mountains. These are defined from north to south: Lee Vining Canyon, Mono County (reintroduced); Wheeler Ridge, Inyo County (reintroduced); Mount Baxter, Inyo County (native); Mount Williamson, Inyo County (native); and, Mount Langley, Inyo County (reintroduced). Basic habitat requirements of these bighorn sheep include open, rocky, and precipitous slopes for detecting and avoiding predators. These bighorn sheep occur as high as 14,000 feet in the summer and historically recede to lower elevations in the winter, depending on storm severity.

Emergency action was taken in 1999 by the California Fish and Game Commission and the U.S. Secretary of the Interior to list the Sierra Nevada bighorn sheep (SNBS) as endangered under both the State and the Federal endangered species acts. This action was in response to a significant decline in the population size from an estimated 310 in1985 to an estimated 90-100 individuals in 1999. The reduction was apparently due to predation, severe winters, and accidental deaths in avalanches. With the small and declining population of SNBS, the threat of this unique subspecies becoming extinct is great.

The SNBS is one of the rarest and most endangered mammal subspecies in North America. Due to the high level of public attention and concern, the DFG was provided funding (in 1999 and 2000) through a legislative request to implement a recovery program for this population of sheep. This funding allowed us to initiate a long-term comprehensive population recovery program. Elements of this recovery program include intensive population monitoring, reducing mortality, reestablishing additional populations in historical range, and preparing for and potentially implementing captive 84 Department of Fish and Game breeding to increase population size and maintain genetic diversity. The continued monitoring of all bighorn sheep populations in the Sierra Nevada remains a high priority.

The status in 1999 of the California bighorn sheep: Declining.

Owens tui chub (*Gila bicolor snyderi*)

California listing: Endangered (1974)

Federal listing: Endangered (1985)
General Habitat: Great Basin Province, Permanent Streams with Fishes,Artificial Ponds

The Owens tui chub is very similar in appearance to the closely related Mohave tui chub. Owens tui chub are large-scaled, small, chunky fish. They are olive-colored on the dorsal surface and bluish or creamy-white below. To distinguish the Owens tui chub from other tui chub, you must microscopically examine the scale and gill rakers. The maximum body length is approximately eight inches. Owens tui chub spawn from spring through late fall. Females lay adhesive eggs on vegetation or other available substrates, such as rocks and gravel. Owens tui chub eat insect larvae and, to a lesser degree, algae and detritus. The historic distribution was throughout the standing water sand low gradient reaches of the Owens River and its larger tributaries extending fromthe river's headspring to Owens Lake. The major threats to the Owens tui chub are lack of sufficient habitat due to insufficient water supply, the introduction of Lahontan tui chubs that readily hybridize with Owens tui chub, and the introduction of predatory fish species.

In 1997, the DFG received federal Section Six grant funding to carry out portions of USFWS™s Recovery Plan for Owens Basin Wetland and Aquatic Species. Activities being conducted using these funds are population monitoring, maintenance of existing refuge sites, control of harmful exotic species, identification of additional refuge sites, and reestablishment of rare species in restored habitats.

The status in 1999 of the Owens tui chub: Stable.

Bald eagle (*Haliaeetus leucocephalus*)
California listing: Endangered (1971); Fully Protected
Federal listing: Endangered (1967); Threatened (1995)
General Habitat: Various Woodland , Forest, Grassland, and Wetland Habitats

The bald eagle is a large, dark brown bird of prey, which, as an adult, has a whitehead and tail. It occurs widely in North America. The species winters throughout most of California at lakes, reservoirs, river systems, and some rangelands and coastal wetlands. The breeding range is mainly in mountainous habitats near reservoirs, lakes and rivers, mainly in the northern two-thirds of the State, in the Central Coast Range, and on Santa Catalina Island. The birds are opportunistic foragers, usually feeding on fish or waterfowl, but they also prey on other small animals and eat carrion.

The USFWS reviewed the regional recovery plans in the nation to assess future the bald eagles status and planning needs. On July 6, 1999, the USFWS officially proposed to remove the bald eagle from the federal list of endangered and threatened wildlife because reclassification goals for recovery of this species have been met and exceeded. Public comments on the proposal will be reviewed by the USFWS and a decision to delist should be reached in 2000.

The Status in 1997 of the bald eagle: Increasing.

Swainson's hawk (*Buteo swainsoni*)
California listing: Threatened (1983)
Federal listing: None
General Habitat: Valley and Foothill Grassland

The Swainson's hawk is a medium-sized hawk with relatively long, pointed wings and a long, square tail. Adult females weigh 28 to 34 ounces and males 25 to 31 ounces. Swainson's hawks breeding in California may spend the winter in Mexico and South America. Swainson's hawks require large, open grasslands with abundant prey in association with suitable nest trees. Suitable foraging areas include native grasslands or lightly grazed pastures, alfalfa and other hay crops, and certain grain and row croplands. Unsuitable foraging habitat includes crops such as vineyards, orchards, certain row crops, rice, corn and cotton crops. Suitable nest sites may be found in mature riparian forest, lone trees or groves of oaks, other trees in agricultural fields, and mature roadside trees.

Swainson's hawks were once found throughout lowland California and were absent only from the Sierra Nevada, north Coast Ranges and Klamath Mountains, and portions of the desert regions of the State. Today, Swainson's hawks are restricted to portions of the Central Valley and Great Basin regions where suitable nesting and foraging habitat is still available. During historical times (ca. 1900), Swainson's hawks may have maintained a population in excess of 17,000 pairs. Based on a study conducted in1994, the statewide population is estimated to be approximately 800 pairs. Although more recent surveys have been planned to revise this estimate, there has been inadequate funding available to carry out the research. However, surveys in 1998 and 1999 in the Owens Valley area of the State revealed a larger population (about 20 pairs) than previously documented, centered around alfalfa fields in the area.

The loss of agricultural lands to various residential and commercial developments is a serious threat to Swainson's hawks throughout California. Additional threats are habitat loss due to riverbank protection projects, conversion from agricultural crops that provide abundant foraging opportunities to crops such as vineyards and orchards which provide fewer foraging opportunities, shooting, pesticide poisoning of prey animals and hawks on wintering grounds, competition from other raptors, and human disturbance at nest sites.

The status in 1999 of Swainson's hawk: Declining.

American peregrine falcon (*Falco peregrinus anatum*)
California listing: Endangered (1971); Fully Protected
Federal listing: Endangered (1970); Delisted (1999)
General Habitat: Wide Range of Habitats

Adult peregrines are slate gray above and light below, and the dark cap of the head extends to the cheeks. The wingspan exceeds three feet. The range includes mos tof California, except in deserts, during migrations and in winter. The California breeding range, which has been expanding, now includes the Channel Islands, the coast of southern and central California, inland north coastal mountains, Klamath and Cascade ranges, and the Sierra Nevada. Nesting sites are typically on ledges of large cliff faces, but some pairs are nesting on city buildings and bridges. Nesting and wintering habitats are varied, including wetlands, woodlands, other forested habitats, cities, agricultural areas and coastal habitats. Peregrine falcons feed on birds that are caught in flight. Subsequent to the 1993-1995 status report, annual breeding population surveys of peregrines have continued, but no agency funding was available to support a statewide survey in 1996. Although annual survey data collected since 1993 are not directly comparable to results obtained prior to that year, they indicate that the current breeding population size has not declined, and probably has increased.

The status in 1999 of the American peregrine falcon: Increasing.

The following excerpts from the **June Lake Avalanche Bypass Road Environmental Impact Report/Environmental Assessment (Avalanche EIR/EA)** provide additional information on some of these special status species within the Eastern Sierra and in particular in June Lake:

Bald Eagle
The preferred habitats commonly used by wintering bald eagles in the eastern Sierra are those associated with open water such as lakes, reservoirs, wetlands and river systems. In the eastern Sierra, eagles are also known to concentrate in areas that support large populations of black-tailed jackrabbits. Black-tailed jackrabbits, carrion in the form of winter or road-kill mammals, and sick or wounded waterfowl, are all important food items for bald eagles. The largest threat to bald eagles appears to be habitat loss as a result of logging, mineral exploration and other human related activities. These activities, no matter how small or insignificant they may seem, may have a significant, cumulative effect on the total population.
Bald eagles have been observed in the project vicinity (North Shore Drive vicinity), but are not known to nest in or near the project area. June Lake appears to be an adequate foraging area for wintering bald eagles, providing the preferred habitat and food requirements necessary for survival. Bald eagles typically roost in mature coniferous trees because they normally afford the greatest protection from inclement weather.
(Avalanche EIR/EA, p. 25)

Sierra Nevada Red Fox
The Sierra Nevada Red Fox is a relatively secretive animal that occupies a variety of habitats in the alpine and subalpine zones of the Cascade and Sierra Nevada mountains of California. Because of its secretive nature, little is known about the habitat and ecology of this subspecies. It has been documented at elevations ranging from 5,000 to 11,000 feet and appears to prefer red fir and lodgepole pine forests in alpine and subalpine zones. The red fox may hunt in forest openings, meadows, and barren rocky areas associated with these high elevation habitats. It uses rock piles as denning sites to rear the young.
(Avalanche EIR/EA, p. 30)

WILD LIFE SPECIES OF AREAWIDE IMPORTANCE

Mule Deer
Mule deer generate tourist traffic during the off-season hunting period and provide aesthetic pleasure for residents and tourists. While not classified as a special status species, mule deer are nonetheless sensitive to growth and development. Consideration should be given to any and all major projects where impacts may negatively affect their established migration routes and fawning and summering habitats and activities.

Lone bucks, does with fawns, and family groups which migrate through and summer in and around the Loop belong to one of two major deer herds; the Mono Lake herd and the Casa Diablo herd. Migration routes and holding areas for these herds are shown in Figure 26.

Mono Lake Herd
Recent CDFG estimates indicate that the Mono Lake herd contains a population of between 4,000 to 5,000. The Mono Lake herd winters near Hawthorne, Nevada and summers in the central

Sierra, including a portion of the June Lake Loop. The exact locations of the herd's summering grounds and migration routes are not known at present. General observation indicates that major crossings occur on U.S. 395 near the base of Conway Grade on U.S. 395, south of Lee Vining, and near the north U.S. 395 and S.R. 158 junction. The number of deer that break off from these groups to migrate through or summer within the Loop, while as yet undetermined, is expected to be substantial. In early 1988, the CDFG began a three year radio telemetry study to identify the herd's summering grounds and migration routes.

Casa Diablo Herd

A recently completed study on the Casa Diablo herd found that a large segment of this population migrates to summering habitat in and adjacent to the June Lake Loop from wintering grounds near Benton. The 1500 to 2000 members of this herd follow three principal migration corridors. The smallest number migrates through the Deadman, White Wing and Glass Creek areas. Some remain in this area while others travel over San Joaquin Ridge to summering grounds located further west. The majority of the herd utilizes two separate and distinct migration corridors. The southern migration corridor heads west from Bald Mountain, crossing U.S. 395 near Wilson Butte. The corridor continues in a northwesterly direction crossing S.R. 158

FIGURE 26
DEER MIGRATION AND HOLDING AREA MAP

near Oh! Ridge and terminates near Reversed Peak. The northern most migration corridor follows a northwesterly course from Bald Mountain through Clark and Alpers Canyons. Paralleling the tunnel road along the west side of the Mono Craters, the corridor turns west near the Aeolian Buttes, crossing U.S. 395 near the West Portal turnoff. From here it follows a course around the north end of Grant Lake, to spring holding areas (staging grounds) in the general vicinity of Parker and Walker Lakes. While some deer remain in this area for the remainder of the summer, others continue their migration in search of summering areas located to the north and south. Those that head north have been tracked as far as Twin Lakes near Bridgeport. Most, however, find needed habitat in Lee Vining and Lundy Canyon areas. Those heading south summer in ranges throughout the June Lake Loop and the mountains to the west.

According to Ron Thomas, CDFG Wildlife Biologist, the marsh-meadow area between Silver Lake and the Clark Tract subdivision may serve as a critical corridor where large numbers of deer migrate off Reversed Peak enroute to summering grounds within the Reversed Creek, Rush Creek and Alger Creek watersheds. Routes across public and/or private lands in the west side of the canyon have not yet been identified.

Additional information concerning the Casa Diablo deer herd is contained in the following excerpt from the **June Lake Avalanche Bypass Road Environmental Impact Report/Environmental Assessment (Avalanche EIR/EA):**

> The annual life-cycle of deer from the Casa Diablo herd consists of four periods: spring migration, summer, fall migration, and winter. The spring migration begins in early April when deer leave the winter range and move in a westerly direction, along the base of the southern escarpment of the Glass Mountains to a large spring holding area located on the Upper Owens River..... Deer arrive on the summer range in May and June, produce fawns in July and begin fall migration back to the winter range in October. Fall migration is more rapid than spring and is usually triggered by the first heavy, fall snow storm. Deer arrive on the winter range in November and December, breed in December and January, and begin the annual life-cycle again.
>
> A 1988 Department of Fish and Game radio-telemetry study indicated that a portion of the Casa Diablo herd uses the June Lake Loop area for summer range. According to the study, of 27 deer captured on the Casa Diablo winter range, 13 (48 %) summered on the east slope of the Sierra in the vicinity of the June Lake Loop.
> (Avalanche EIR/EA, p. 11)
>
> The most recent population estimate for the Casa Diablo herd is about 1,500 animals. According to DFG's Casa Diablo Deer Herd Management Plan, the optimal spring population is 2,245 deer based on the range's carrying capacity. Other plan objectives are to maintain spring fawn ratios at 50 fawns per 100 does during cycles when the herd population is lower than usual, and to attain and maintain post season buck ratios of 20 bucks per 100 does.
> (Avalanche EIR/EA, p. 12)

Ground surveys and track count studies performed for the June Lake Avalanche Road EIR/EA identified deer travel routes and feeding or resting areas in the vicinity of North Shore Drive. During the late summer/early fall survey, peak deer activity in the area occurred between August 31 and October 7, with most deer moving through the area by the end of October (Avalanche EIR/EA, p. 17). Deer activity was concentrated in montane chapparal and Jeffrey pine habitats that provide cover and forage for the deer. The montane chapparal habitat is dominated by curlleaf mountain mahogany growing in dense stands (Avalanche EIR/EA, p. 22). Deer use of these habitat types is dependent on the availability of water from Gull and June

Lakes; "water requirements by deer appear to be related to dry matter intake, indicating that water consumption may be greatest during spring, summer and fall when forage consumption is greatest" (Avalanche EIR/EA, p. 22).

Deer Fawning

The protection, preservation and enhancement of June Lake's deer fawning habitat will play a critical role in the community's effort to sustain and increase mule deer population levels. Quality fawning habitat can be broadly defined as an undisturbed environment containing sufficient and readily accessible sources of food, water, shelter, cover and thermal protection, all within a relatively well defined land area.

Community growth and development activities impact deer fawning by directly replacing deer fawning habitat and by indirectly creating additional disturbances to fawning habitat in close proximity to expanding areas. Another impact results from the continual disturbance of fawning activities by free roaming dogs. Regardless of the habitat's quality, or the level of disturbance caused by construction activity, if dogs are allowed to run free, deer fawning in established fawning niches will be disrupted. This problem is indirectly related to irresponsible dog owners and limited enforcement of local leash laws.

Trout

Trout fishing is one of the Loop's most popular and economically important recreational activities. From opening day on the last Saturday in April, to the close of the season on October 31, individuals, families, and organized fishing clubs fish at the Loop's numerous local and back country lakes and streams.

Fishing waters within the Loop proper include four lakes, two major creeks and a number of tributary streams. Natural fish reproduction in these resident trout habitats falls short of meeting current sport fishing demands. The shortfall is supplemented by CDFG hatchery born and reared trout.

June Lake, Gull Lake, Silver Lake and Grant Lake offer both shore and boat fishing with marinas and boat launching facilities located at each. Rainbow Trout (Salmo gairdneri), the principal game fish reared at the CDFG Fish Spring Hatchery, is regularly planted in each of these lakes as well as Walker Lake. Genetically, this species is not well adapted for spawning and is therefore considered a "put and take" species by the CDFG. Species better adapted for spawning in the streams tributary to Gull Lake, Silver Lake, and Grant Lake include the Brown Trout (Salmo trutta) and Eastern Brook Trout (Salvilinus fontinalis). These species are reared at the CDFG Hot Creek Hatchery and are occasionally planted in the Loop lakes. Parker Lake and Walker Lake, two popular day hike fishing spots northwest of Grant Lake, also contain naturally reproducing populations of Brown and Eastern Brook Trout.

The characteristics of the Loop's streams and creeks vary significantly. Reversed Creek and its tributary streams are relatively narrow and surrounded by brush, limiting fishing to the bank. Rush Creek is considerably wider with an open vegetative canopy, lending itself to a variety of fishing techniques, including fly fishing. Hot Creek Hatchery reared Rainbow Trout and native Brown Trout are commonly taken from these waters. Rush Creek above Grant Lake is considered an excellent spawning tributary and as a result is closed during most of October when wilder species begin their fall spawning runs. Lakes and streams within the Ansel Adams Wilderness Area (located directly west of the Loop and accessible from the Gem Lake Trail head near Silver Lake) sustain populations of Eastern Brook and Rainbow Trout. Golden Trout (Salmo

aquabonita), considered the most beautiful trout of the Sierra, thrive in a few lakes and streams at higher elevations, including Alger and Lost Lakes. Cutthroat Trout (Salmo clarkii), the first trout species introduced in the 1850's, has been out-competed by other species and occurs only in limited numbers. Recent efforts by the CDFG to enhance cutthroat populations have had limited success.

CHAPTER 17
NATURAL HAZARDS

NATURAL HAZARDS

The June Lake area is subject to numerous natural hazards, including geologic hazards, seismic and volcanic activity, avalanches, floods and fires. The following documents were used in preparing this section: **Hazard and Planning Geology of the June Lake Loop Area, Mono County, California** (1974); **Mono County Master Environmental Assessment** (2001); **Draft Conway Ranch Environmental Impact Report** (1989); and **June Lake Area General Plan** (1974).

GEOLOGIC HAZARDS

Hazards relating to geologic formations and processes other than those related to seismicity are indicated on the Geologic Hazard Map, Figure 27. Six geologic hazard units have been defined including Active Rockfall Areas, Active Debris Fans, Inactive Debris Fans, Active Talus and Blockfall Areas, and Glacial or Morainal Till areas. Stable bedrock and alluvial deposits are also indicated. Technical information on the nature of the individual geologic units, and the geologic activity and processes which cause hazards is contained in the report, **Hazard and Planning Geology of the June Lake Loop Area, Mono County, California**, by Robert R. Curry, Geology Consultant.

Active Rockfall Areas

Active rockfall areas are defined as hillslope areas comprised of largely morainal deposits, clearly demonstrating that frequent natural episodes of rolling and bouncing rocks and boulders occur. Both source areas and areas below source areas where damage could occur and that could limit uses of a site are mapped. Releases can occur at any time the hillsides are not covered with a blanket of snow greater than two to three feet.

USFS permittee cabins located on the hill overlooking Gull Lake on the south side of S.R. 158, and the June Mountain Ski Area would be the only developed areas potentially impacted by active rockfalls.

Active Debris Fans

Areas mapped as active debris fans are depositional fan areas created by mudflows and identified by their funnel-like shape and grooved surface. Fan deposition occurs in gullies during periods of intensive surface water runoff caused by rainstorms or snowmelt. Mudflows and rockflows occur when intense surface discharges flow over partially saturated slope materials. Fan flow frequencies vary from once every 100 years to as frequent as once every 10 years.

Active debris fans could impact development along the Down Canyon area's south-west boundaries and near the Silver Lake Resort.

Inactive Debris Fans

Designated inactive debris fans are stabilized in terms of the fan-forming process and do not constitute a hazard due to debris flows as long as overall alterations to the vegetative cover and slope materials do not occur. Changes in land use or natural occurrences such as fires or avalanches can change the vegetative cover and reactivate debris fans. Assuming changes do not occur, the frequency of damaging debris flows is greater than one every 100 years.

A small portion of the Peterson Tract's southwest corner could be impacted by an inactive debris fan. Since most of the inactive debris fan is located on National Forest lands, development is not anticipated to disturb the vegetative covering and increase land use hazards.

Active Talus and Blockfall Areas

Designated units include areas where active accumulation and transportation of blockly boulder deposits occur and where the occasional release of boulders due to spring snowmelt or snow and boulder avalanches occurs. Blockfall is the process of direct vertical fall of rock while talus is the bouncing of boulders down a debris chute onto the depositional slope.

Inactive Talus and Blockfall Areas

Inactive Talus and Blockfall Areas are currently not transporting boulders and other slope debris. However, these areas are still subject to spring-time snowmelt release of occasional boulders and are subject to snow and boulder avalanches during winters of heavy snow accumulation.

Inactive Landslides

Only two inactive landslides are indicated on the Geologic Hazard Maps. The largest is an unconsolidated debris avalanche landslide originating near the summit of June Mountain and terminating near the June Mountain Ski Lodge. It is composed of mixed bedrock and till and appears to have occurred prior to the last peak major glacial period over 18,000 years ago. The second slump-type of landslide is found along the northwest side of Rush Creek below Silver Lake in an area of thin till cover over bedrock. Under non-seismic conditions these areas do not comprise a hazard to land use activity, except to uses such as man-made lakes, sewage drain fields, or other unnatural sources of water which may over-saturate and load the unit.

Till, Alluvium and Sediments

As components of morainal deposits, till, alluvium and sediments were deposited by receding glaciers in the lower reaches of the June Lake Loop. Morainal materials tend to be dry except when adjacent to lakes. Non-saturated moraines are quite stable and do not present a slope stability hazard unless artificially charged with water.

Most private land in June Lake is located on till, alluvium and sediments. Unless saturated like the areas between June and Gull Lakes and the Silver Lake meadow, these areas should not present a hazard to future land uses.

FIGURE 27
GEOLOGIC HAZARDS

VOLCANIC HAZARDS

Evidence of volcanic activity can be found throughout the southern section of Mono County. Potential volcanic hazards are described based upon the following documents: **Draft Conway Ranch combined Specific Plan and Environmental Impact Report**, September 1989 and the **Mono County Master Environmental Assessment,** 2001.

The June Lake Loop lies near the Long Valley Caldera and the Inyo-Mono Crater Chain (Figures 28 and 29). Volcanic eruptions along these formations have occurred over the past 2,000 years at an average rate of one occurrence per century. As recent as 1982, the U.S. Geological Survey (USGS) detected signs of volcanic activity and issued a "Notice of Potential Volcanic Hazard" warning. In 1984, the notice was rescinded. Volcanic eruptions, unless of catastrophic magnitudes such as the one that created the Long Valley Caldera, generally do not result in direct loss of life, but may result in considerable property loss and may have associated loss of life due to earthquakes, observer ignorance, and/or general panic. Volcanic hazards include explosive blasts, pumice and ash fall out and hot flowing material.

An additional volcanic hazard could occur if eruptions of hot ash and pumice occurred during times of snowcover. When hot ash and pumice mix with snow-covered slopes, pyroclastic flows or both hot and cold masses of ash, pumice, debris and water form. These flows flow downslope ultimately burning or burying all in their path. If hot pumice and ash were to fall on a heavy snowpack around June Mountain, catastrophic flows could destroy Hartley Springs and the June Lake Village area. The probability of occurrence is expected to be less than one in a 100 years.

For additional current information on volcanic-related activity and potential impacts to Mono County and June Lake, see the U.S. Geological Survey website, www.usgs.gov.

SEISMIC HAZARDS

Located in one of the most seismically active areas in the Western United States, the June Lake area is subject to numerous dangers including the primary effects of ground rupture, ground shaking and dam failure, and the secondary effects of soil differential compaction/settlement, liquefaction and landslides. June Lake lies in a region of very high seismicity. Mono County is located at a stress point where the earth's crustal plates are exerting opposite pressures against each other. This combination creates both "tectonic" earthquakes (e.g. land mass movement) and volcanic activity that can trigger earth shaking (e.g. magma chamber movement and lava dyke formations). Up-to-date information concerning earthquakes in the county is available on the U.S. Geological Survey website, www.usgs.gov.

Earthquake Epicenters and Magnitudes

Earthquakes occurring in the June Lake Area between 1900 and 1982 with magnitudes on the Richter scale of greater than three are shown in Figure 30. The largest seismic event shown on the map was a 4.9 event; most were equal to or less than 3.9. While noticeable to people, earthquakes of less than a Richter magnitude of 4.0 are considered small. Quakes of larger magnitudes, greater than 6.0, have occurred south of the planning area in Long Valley, and the May, 1980 earthquake series near Mammoth Lakes had Richter magnitudes ranging up to 6.0. Quakes of this magnitude often cause severe damage.

FIGURE 28
VOLCANIC VENTS IN THE MONO BASIN

FIGURE 29
VOLCANIC HAZARDS

FIGURE 30
EARTHQUAKE EPICENTERS, 1900-1982

Fault Movement and Ground Rupture

Earthquakes are usually caused by sudden movement along geologic faults. The California Department of Conservation, Division of Mines and Geology (DMG), has evaluated potentially and recently active faults in the County. Based upon these DMG studies, fault hazard zones (Alquist-Priolo Special Studies Zones) have been designated for the county.

Fault-rupture zones, shown in Figure 31, are defined as areas that are well-defined and sufficiently active to constitute a potential hazard from surface fault rupture. In these zones, state mandated regulatory measures prevent the County from allowing structures designed for human occupancy and require full geotechnical analysis for any proposed projects. Three Alquist-Priolo zones could affect future land uses in the June Lake area, including the fault north-east of Oh! Ridge, the fault running through the West Village and the fault in the western section of the Down Canyon area. For additional current information on earthquakes and fault movement in the county, see the US Geological Survey website, www.usgs.gov.

Ground Shaking

The primary seismic hazard in the County is strong to severe groundshaking generated by movement along active faults. The entire county, except for a small portion of the Sierra crest, is in an area where intense groundshaking is possible. This area has been designated as a Seismic Zone 4, the zone of greatest hazard defined in the Uniform Building Code.

Almost all of Mono County is located in an area where intensive groundshaking is possible. The California Division of Mines and Geology places the county in a region where major earthquake damage is expected. In the Uniform Building Code, the area is designated as seismic zone 4, the zone of greatest hazard. Ground shaking associated with earthquakes of greater than Richter magnitude 5.5 may result in forces greater then those accounted for in the Uniform Building Code, particularly if structures are located near the epicenter. The extent of damage depends on the characteristics of the quake and the nature of geologic materials.

Water Waves

Fault rupture and ground shaking resulting from earthquakes can generate waves in lakes, reservoirs or water tanks. Two facilities, the Los Angeles Department of Water and Power Grant Lake Dam and the June Lake Public Utility District Water Storage facility, could be susceptible to damage in a large magnitude earthquake.

Ground Failure

Ground failure induced by earthshaking includes differential settlement/compaction and liquefaction. Differential compaction occurs when earthshaking forces rearrange poorly consolidated soils. Settlement leading to structural damage is normally associated with rapidly deposited alluvial soils such as in alluvial fans or active stream channels, or improperly founded or poorly compacted fills.

Soil liquefaction caused by earthshaking involves a sudden loss in strength of a saturated, cohesionless soil (predominately sand) and results in the temporary transformation of the soil into fluid mass. Liquefaction typically occurs in areas where the groundwater is less than 30 feet from the surface, and where the soils are composed predominantly of poorly consolidated fine sand.

Landslides

Only two inactive landslides, which occurred over 10,000 years ago, are found in June Lake; no active landslide areas have been identified. One of the inactive slides originates near the summit of June Mountain and terminates near the June Mountain ski lodge. The other is located on the northwest side of Rush Creek below Silver Lake. Even under seismic conditions, due to the lack of potential landslide areas and the occurrence of inactive slides away from designated community areas, landslides do not constitute a hazard to future or existing land uses.

FIGURE 31
FAULT-RUPTURE ZONES

AVALANCHE HAZARD

Thousands of snow avalanches occur in the Sierra Nevada each year. The U.S. Forest Service "Avalanche Handbook" defines avalanche to mean "a mass of snow that sometimes contains rocks, soil and ice moving rapidly downslope". Numerous factors contribute to unstable snow conditions, including snowpack structure, snow density, temperature fluctuations, wind speed and direction, precipitation intensity, etc. Most avalanches go undetected and pose no risk to man or his activities. Avalanches become hazardous to man when they cause impacts on human activities, such as:

- recreational backcountry use
- exposure on highways or railroads
- construction or maintenance activities
- resort activities such as ski areas
- emergency services (exposure to rescue teams, etc.)
- exposure to fixed facilities (homes, businesses, etc.)

The entire outer perimeter of the June Lake Loop from Oh! Ridge to north of Grant Lake has been identified as an avalanche hazard area in the **June Lake Loop Avalanche Hazard Study.** Using the Swiss classification system, avalanche hazards have been classified into three levels of potential hazard, according to estimated frequency and the destructive power of anticipated avalanches. The Avalanche Hazard Map, Figure 32, delineates avalanche hazard zones within the Loop according to this system. Several factors such as terrain configurations, vegetative cover, avalanche debris distributions, historic climatic conditions, and other natural occurrences experienced at the site were considered in formulating the avalanche hazard map.

The glacially-cut canyon walls and morainal deposits along the outer perimeter of the June Lake Loop provide starting zones for many avalanches. Most areas in the Loop are subject to avalanches, however avalanches on the southern half of the Loop create a greater hazard to life and property than those on the northern half. Avalanche dangers force the closure of the northern half of the Loop road during the winter. Also, the northern half of the Loop contains no private land. On the southern half of the Loop roadway, avalanches starting on north facing slopes overlooking June Lake can cause temporary road closures. Caltrans and Mono County completed an avalanche bypass road, North Shore Drive, to provide an alternative access to the community when the June Lake Loop is closed by avalanche hazards.

In 1988, the County revised its avalanche policies to restrict development in historic avalanche areas. Single-family homes and related structures are the only type of development allowed in historic avalanche areas without Planning Commission or Board of Supervisors approval. Projects more intensive than single-family developments may be constructed in avalanche areas if adequate structural mitigation is provided. Figure 33 shows June Lake's conditional development areas.

Without exception, all avalanches threatening developed community areas in Mono County originate on Forest Service lands. The Inyo National Forest has indicated support for exchanging certain privately owned hazard areas in the June Lake area.

A backcountry avalanche monitoring program is operated out of Mammoth Mountain facilities by the Inyo National Forest. This monitoring program issues avalanche hazard warnings during periods of high avalanche danger in the backcountry. The County Sheriff's Department keeps in contact with the Forest Service and should a hazardous situation develop, personally advises those within the hazard-prone area of the critical nature of the hazard.

FIGURE 32
AVALANCHE HAZARDS

FIGURE 33
JUNE LAKE VILLAGE CONDITIONAL DEVELOPMENT AREA

FLOOD HAZARDS

Flooding in June Lake can occur around streams, lakes and areas of high groundwater. Figure 34, adopted from Flood Insurance Rate Maps prepared by the Federal Emergency Management Agency, shows the areas likely to be impacted by a 100-year flood (100-year floods have a one percent chance of occurring in any one year). The most vulnerable areas of private land include lakeshores and a two hundred foot-wide band around Reversed Creek in the Down Canyon area, the drainage ditch between June and Gull Lakes, and along the small drainage between the intersection of Gull Lake Road and S.R. 158 and Gull Lake. Potential flood areas not affecting private lands include a band along Rush Creek below Silver Lake and the lakeshores of Gem and Agnew Lakes.

The FEMA maps lack information regarding the base flood elevation, and are therefore of limited use for planning purposes. The maps also lack information concerning local alluvial fan and mud flow hazards. There is a significant need to update the flood hazard maps of those community areas, including June Lake, where development pressures are the greatest.

FIRE HAZARDS

The California Division of Forestry (CDF) has mapped private land areas within the State and classified all lands according to the severity of fire hazards. All privately owned parcels within the Loop are designated as "very high hazard" lands. The degree of hazard is based on fuel loading, fire weather, and other related factors. Using another rating system, the Insurance Service Office (ISO), assigns the June Lake community a rating of seven, on a one to ten scale, with ten being the lowest rating for fire protection.

Fire suppression and protection are discussed more fully in Chapter 4, Community Services and Facilities.

FIGURE 34
FLOOD INSURANCE RATE MAPS

GLOSSARY

ACEC **Area of Critical Environmental Concern.** Designated by the BLM for special management to protect resources.

BLM **Bureau of Land Management.** Responsible for managing a portion of the public lands in Mono County. See www.blm.gov -- National office, www.ca.blm.gov -- California office, www.ca.blm.gov/bishop -- Bishop office.

CASP **California Aviation System Plan.** Prepared by Caltrans every five years to integrate regional aviation system planning on a statewide basis.

CDFG **California Department of Fish and Game.** Responsible for California Natural Diversity Database (CNDDB), wildlife and habitat conservation data, special status species information, wildlife habitat conservation. See www.dfg.ca.gov .

CTC **California Transportation Commission.** Formulates and evaluates state policies and plans for transportation programs. Approves the RTIP, the STIP, and the SHOPP.

CURES **Coalition for Unified Recreation in the Eastern Sierra.** A group composed of representatives from local, state, and federal agencies in the Eastern Sierra whose goal is to coordinate activities related to recreation and tourism.

FHWA **Federal Highway Administration.** A component of the U.S. Department of Transportation, established to ensure development of an effective national road and highway transportation system. Approves federal funding for transportation projects.

FSTIP **Federal State Transportation Improvement Program.** A 3-year list of transportation projects proposed for funding developed by the State in consultation with Metropolitan Planning Organizations and local non-urbanized governments. The FSTIP includes all FTIP projects and other federally funded rural projects.

FTA **Federal Transit Administration.** A component of the U.S. Department of Transportation, responsible for administering the federal transit program under the Federal Transit Act, as amended and TEA 21.

FTIP **Federal Transportation Improvement Program.** A 3-year list of all transportation projects proposed for federal funding, developed as a requirement of funding. In air quality non-attainment areas, the plan must conform to the SIP.

IIP **Interregional Improvement Program.** One of two broad programs under the STIP. Funded from 25 % of the SHA revenues programmed through the STIP.

ITIP **Interregional Transportation Improvement Program.** Funds capital improvements on a statewide basis, including capacity increasing projects primarily outside of urbanized areas. Projects are nominated by Caltrans and submitted to the CTC for inclusion in the STIP. Has a 4-year timeframe and is updated biennially by the CTC.

ITS **Intelligent Transportation Systems.** The use of advanced sensor, computer, electronics, and communication technologies and strategies to increase the safety and efficiency of the transportation system.

LOS **Level of Service (LOS)** is a qualitative measure describing operational conditions as perceived by motorists within a traffic stream. LOS generally describes these conditions in terms such as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. Current LOS conditions are based on the latest traffic counts. Projected LOS conditions are based on growth factors derived from historical growth trends.

LOS A A condition of free flow and low volumes with high speeds. Traffic density is low with speed controlled by driver desires, speed limits, and physical roadway conditions. There is little or no restriction in maneuverability due to the presence of other vehicles and little or no delay.

LOS B Stable flow exists with operating speeds beginning to be restricted somewhat by traffic conditions. Drivers still have reasonable freedom to select their own speed and land of operation. Reductions in speed are not unreasonable with low probability of traffic flow being restricted.

LOS C Still a zone of stable flow, but speeds and maneuverability are more closely controlled by the higher volumes. Most of the drivers are restricted in their freedom to select their own speed, change lanes, or pass.

LOS D Unstable traffic flow is approaching, with tolerable operating speeds being maintained though considerably affected by changes in operating conditions. Fluctuations in volume and temporary restrictions to flow may cause substantial drops in operating speeds.

LOS E Operation is at lower speeds than in Level "D" with volumes at or near the capacity of the highway. Flow is unstable with speeds in the neighborhood of 30 mph. There may be stoppages of momentary duration.

LOS F This is forced flow operation at low speeds where volumes are below capacity. These conditions usually result from vehicles backing up from downstream restrictions. Speeds are reduced substantially, and stoppages may occur for short or long periods of time because of downstream congestion.

LTC **Local Transportation Commission.** The Mono County LTC is the Regional Transportation Planning Authority (RTPA) for Mono County.

RIP **Regional Improvement Program.** One of two broad programs under the STIP. Funded from 75 % of the STIP funds, divided by formula among fixed county shares. Each county selects the projects to be funded from its county share in the RTIP.

RTIP **Regional Transportation Improvement Program.** A list of proposed transportation projects submitted to the California Transportation Commission by the RTPAs for state funding. Has a 4-year timeframe and is updated biennially by the CTC.

RTP **Regional Transportation Plan**. Plan prepared biennially by regional transportation planning agencies (e.g. Mono County Local Transportation Commission "LTC") which describes existing and projected transportation needs, actions and financing for a 20-year period.

SHA **State Highway Account**. The primary State funding source for transportation improvements. Includes revenue from the state fuel tax, truck weight fees, and federal highway funds. Provides funding for a) non-capital outlays (maintenance, operations, etc.), b) STIP, c) SHOPP, and d) local assistance.

SHOPP **State Highway Operations and Protection Program**. California state program intended to maintain the integrity of the state highway system, focusing primarily on safety and rehabilitation issues. A four-year program of projects approved by the CTC separately from the STIP cycle. See www.dot.ca.gov/hq/tpp/Offices/Planning/for further information.

SIP **State Implementation Plan.** An air quality plan developed by the California Air Resources Board in cooperation with local air boards to attain and maintain Federal Clean Air Standards. See www.arb.ca.gov for further information.

STA **State Transit Assistance.** Funds derived from the Public Transportation Account. Fifty percent is allocated to Caltrans, 50 % to the Regional Transportation Planning Authorities "RTPAs" (e.g. Mono County Local Transportation Commission "LTC"). The funds allocated to the RTPAs are available for mass transit projects (50 %) and transit operators (50 %).

STIP **State Transportation Improvement Program.** Includes transportation programs proposed in RTIPs and ITIPs, approved for funding by the CTC. See www.dot.ca.gov/hq/tpp/Offices/Planning/ for further information.

TEA 21 **Transportation Equity Act for the 21st Century**. Contains federally mandated planning requirements and funding programs for transportation projects. See www.tea21.org for further information.

YATI **Yosemite Area Traveler Information System.** A comprehensive system for providing information to Yosemite visitors (road conditions, weather, transportation options, lodging etc.). See www.yosemite.com for further information.

YARTS **Yosemite Area Regional Transportation System.** A regional system providing scheduled service from Madera, Mariposa and Mono Counties to Yosemite, connecting with the Yosemite National Park shuttle service. In Mono County, the service departs from Lee Vining. See www.yosemite.com for further information.

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Table DP-2: Profile of Selected Social Characteristics, 2000, Mono County, California
Table DP-3: Profile of Selected Economic Characteristics, 2000, Mono County, California
Table DP-4: Profile of Selected Housing Characteristics, 2000, Mono County, California

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PERSONS CONSULTED

Federal and State Agencies:

California Air Resources Control Board

California Department of Fish and Game, Bishop: Phil Pister, Darrell Wong, Ron Thomas, Timothy Taylor

California Department of Forestry

California Department of Health Services, Bridgeport: Robin Hook

California Department of Transportation, Bishop: Ken Debox, D.L. Wieman, Terry Gabriel

California Department of Water Resources, Division of Water Rights: Bill Van Dyck

California Highway Patrol: Ray Ripley

California Regional Water Quality Control Board, Lahontan Region: Bob Dobbs, Cindy Rofer, Ken Carter

Great Basin Unified Air Pollution Control District, Bishop: Ellen Hardebeck, Bill Cox, Larry Cameron

U.S. Fish and Wildlife Service: Ed Lorentzen

U.S. Forest Service, Inyo National Forest: Tom Felando, Mark Clark, Tina Hargass, Clint McCarthy, Kathy Irwin, Juan Gallegos, Tom Balint, Nicolas Faust, Wally Wolfenden, John Ellsworth, Bill Bramlette, Rick Murray

U.S. Soil Conservation Service, Bishop: Leonard Jolley

Local Agencies:

Mono County Animal Control: Monica Hopkins

Mono County Energy Management Department: Dan Lyster

Mono County Health Department: Dennis Lampson, Nancy Boardman

Mono County Library System: Arlene Reveal, Hanni Holzman

Mono County Public Works Department: Jim Ward, Randall Berlin
Mono County Sheriff's Department: Terry Padilla

Local Districts and Public Utilities:
June Lake Fire Protection District: Tad Roberts

June Lake Public Utility District: Leonard Ainsworth

INTERNET REFERENCE SITES

The current internet address at the time of printing is listed for these sources; the address may have changed since printing. Some of these sites were consulted for this document; others are listed here as additional resources for current information on various topics pertaining to the June Lake Loop.

STATE AGENCIES

Air Resources Board
Air emissions inventory data. California Air Quality and Emissions Almanac. information on state and federal air quality standards.
arbis.arb.ca.gov

Board of Equalization
Economic statistics (countywide level).
www.boe.ca.gov

California Home Page
Links to all state agencies.
www.ca.gov

California Environmental Quality Act (CEQA)
The complete statutes and guidelines, along with interpretive information.
ceres.ca.gov/ceqa

California Environmental Resources Evaluation System (CERES)
Links to and information on CEQA, SNEP, LUPIN, as well as a variety of land use planning information.
ceres.ca.gov

Department of Finance (DOF)

Demographic Research Unit, population and socio-economic statistics and forecasts, California Statistical Abstract.
www.dof.ca.gov

Department of Fire and Forestry (CDF)

Fire safe standards.
www.fire.ca.gov

Department of Fish and Game (DFG)

California Natural Diversity Database (CNDDB), wildlife and habitat conservation data, special status species information, CDFG Annual Report on the Status of California's Threatened and Endangered Plants and Animals.
www.dfg.ca.gov

Department of Housing and Community Development (HCD)

Housing policies and programs. State and Federal housing finance, rehabilitation and economic development programs.
www.hcd.ca.gov

Department of Industrial Relations

Labor statistics and research (countywide level).
www.dir.ca.gov

Department of Motor Vehicles

Vehicle registration and licensing information (countywide level).
www.dmv.ca.gov

Department of Transportation (Caltrans)

Planning direction and transportation data.
www.dot.ca.gov -- State office
www.dot.ca.gov/dist9-- Bishop office

Employment Development Department (EDD)

Labor market information, socio-economic data, income and poverty statistics (countywide level).
www.calmis.cahwnet.gov

Highway Patrol (CHP)

Collision information and roadway statistics.
www.chp.ca.gov

Lahontan Regional Water Quality Control Board (LRWQCB)

Basin plans and compliance with water quality standards.
www.mscomm.com/~rwqcb6/lahontan

FEDERAL AGENCIES

National Resource Conservation Service (NRCS)

Policies and programs pertaining to natural resource conservation, including soil surveys, watershed surveys and planning, watershed protection and flood prevention, grazing lands conservation, wetlands reserve, and many others.
www.nrcs.usda.gov

U.S. Army Corps of Engineers
Policies and programs pertaining to wetlands.
www.usace.army.mil/

U.S. Census Bureau
Population, income, and poverty data.
www.census.gov

U.S. Department of Commerce, Bureau of Economic Analysis
Income, poverty, and other socioeconomic data (countywide level).
www.bea.gov

U.S. Fish & Wildlife Service
Policies and programs pertaining to fish and wildlife, including wetlands.
www.fws.gov

U.S. Forest Service -- Inyo National Forest
Policies and programs pertaining to Inyo National Forest lands.
www.r5.fs.fed.us/inyo

U.S. Geological Survey
Data and maps on earthquakes, volcanoes, water resources, and biological resources (insects, butterflies, etc.).
www.usgs.gov

LOCAL ENTITIES

Eastern Sierra
Information on the Eastern Sierra Scenic Byway and links to many other sites with Eastern Sierra information.
www.395.com

Eastern Sierra College
Information on the Eastern Sierra College Center, a division of Cerro Coso Community College.
www.cc.cc.ca.us/escc/default.htm

Los Angeles Department of Water and Power (LADWP or DWP)
Information on DWP's land and water systems in Mono County and the Eastern Sierra.
www.ladwp.com

Information provided by DWP on water and restoration activities in the Mono Basin.
www.monobasinresearch.org

Mono County Courts
www.courtinfo.ca.gov/courts/trial/mono

Mono County Government

Currently contains information about the Community Development Department, including forms available on-line. Will soon contain news and information on all County departments.
www.monocounty.gov

Mono County Office of Education

Information on Eastern Sierra Unified School District and the Mono County Library District.
www.monocoe.k12.ca.us

Mono County Public Health Department

Information on animal control, public health services, and environmental health services.
www.monohealth.org

Mono Lake Committee

Information on Mono Lake and many links to other environmental and agency sites with information on the Eastern Sierra.
www.monolake.org

Appendix A: June Lake Map Set

Contents of the Map Set

The June Lake Map Set included with the June Lake MEA is a compilation of maps, photos, and figures that pertain to the June Lake area. The Table of Contents for the Map Set lists the source for each map, photo or figure. Additional information for most sources can be found in the reference section of this document.

How to Use the Map Set

The map set should be used in conjunction with the applicable section of the MEA. The map set is current at the time this document was adopted and is intended to be kept current; however, the original source should also be checked in situations where the most up-to-date information is required.

June Lake Map Set--Table of Contents

I. Land Use Maps

a. **June Lake Area--Aerial Photograph** (Mono County Planning Department GIS)
b. **June Lake Area--Parcel Maps** (Mono County Planning Department GIS)
c. **June Lake Land Use Designations, Walker and Parker Area** (Mono County General Plan, Land Use Element, Figure 62)
d. **June Lake Land Use Designations, Rush Creek** (Mono County General Plan, Land Use Element, Figure 63)
e. **June Lake Land Use Designations, Pine Cliff** (Mono County General Plan, Land Use Element, Figure 64)
f. **June Lake Land Use Designations, June Lake Village** (Mono County General Plan, Land Use Element, Figure 65)
g. **June Lake Land Use Designations, West Village/Rodeo Grounds** (Mono County General Plan, Land Use Element, Figure 66)
h. **June Lake Land Use Designations, Down Canyon June Lake** (Mono County General Plan, Land Use Element, Figure 67)
i. **June Lake Land Use Designations, Silver Lake Meadow** (Mono County General Plan, Land Use Element, Figure 68)
j. **Inyo National Forest Management Direction Map** (Inyo National Forest Land and Resource Management Plan, Map Set)

III. Circulation Systems Maps

Local Roads:

a. **June Lake Aerial Photo with Roads** (Mono County Planning Department GIS)
b. **County Roads--Mono Basin/June Lake** [Mono County Master Environmental Assessment (MEA), Figure 10-4 and Mono County Regional Transportation Plan (RTP), Appendix E]
c. **State Route 158** (June Lake MEA, Figure 8)
d. **Pine Cliff Roads** (June Lake MEA, Figure 9)
e. **June Lake Village Roads** (June Lake MEA, Figure 10)
f. **West Village/Rodeo Grounds Roads** (June Lake MEA, Figure 11)
g. **Down Canyon Roads** (June Lake MEA, Figure 12)

State and Federal Highways:

a. **S.R. 158 Transportation Concept Report Map** [Transportation Concept Report (TCR), Appendix 1]
b. **Scenic Highway/Byway Designation Map** (Mono County RTP)
c. **US 395, Eastern Sierra Scenic Byway, June Lake Section** (www.395.com/scenicbyway/)

Pedestrian and Bicycle Facilities:

a. **June Lake Regional Trails and Bikeways** (Mono County Trails and Bikeway Plan, Bikeway Maps, Routes: R1, R5, R6, and R7)

IV. Transportation Systems Maps

a. **Inyo-Mono Transit Route Map for Bridgeport-Bishop Route** (Inyo-Mono Transit)
b. **CREST Route Map** (Inyo-Mono Transit)
c. **YARTS transit service maps** (www.yarts.com/map/html)

V. Community Facilities Maps

a. **June Lake Ballfield Location Map/Facilities Map** (Mono County Public Works Department)
b. **June Lake Community Park Location Map/Facilities Map** (Mono County Public Works Department)
c. **June Lake Fire Protection District Boundary and Sphere of Influence** (June Lake FPD Sphere of Influence Report)
d. **June Lake Public Utility District Boundary and Planning Concern Area** (June Lake PUD Sphere of Influence Report)

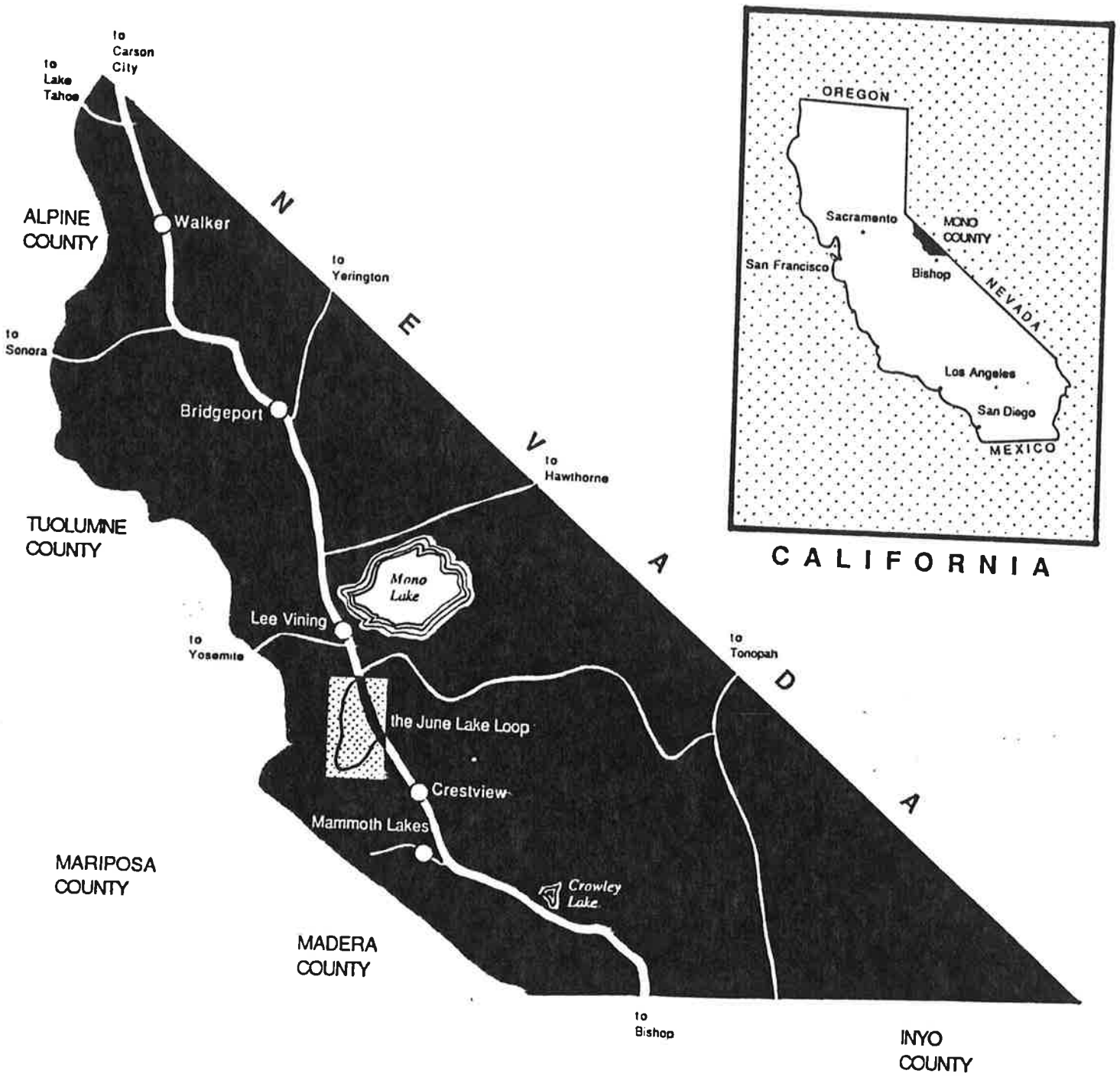
VI. Natural Resource Maps

a. **Developed Recreation Facilities** [Mono County Master Environmental Assessment (MEA), Figure 5 I]
b. **Visual Resources** (Mono County MEA, Figure 12 I)
c. **June Lake Geologic Map** (Mono County MEA, Figure 15 I)
d. **June Lake Mineral Resources** (Mono County MEA, Figure 17 I)
e. **Mono Basin Soil Erosion (includes June Lake)** (Mono County MEA, Figure 18 C)
f. **June Lake Surface Water Resources** (Mono County MEA, Figure 19 I)
g. **June Lake Shallow Groundwater Areas** (Mono County MEA, Figure 21 I)
h. **June Lake Village Noise Contours** (Mono County MEA, Figure 27 H)
i. **June Lake Down Canyon Noise Contours--East Portion** (Mono County MEA, Figure 27 I)
j. **June Lake Down Canyon Noise Contours--West Portion** (Mono County MEA, Figure 27 J)
k. **Special Status Species** (Mono County MEA, Figure 28, Overview Map 24, June Lake)
l. **Special Status Species** (Mono County MEA, Figure 28, June Lake Area)
m. **June Lake Wildlife Use Areas--Big Game** (Mono County MEA, Figure 32 I)
n. **Avalanche Hazards** (Mono County MEA, Figure 37 E)
o. **June Lake Flood Hazards** (Mono County MEA, Figure 38 I)

p. **June Lake Fault Hazards** (Alquist-Priolo Fault Hazard Maps)

June Lake MEA
2002

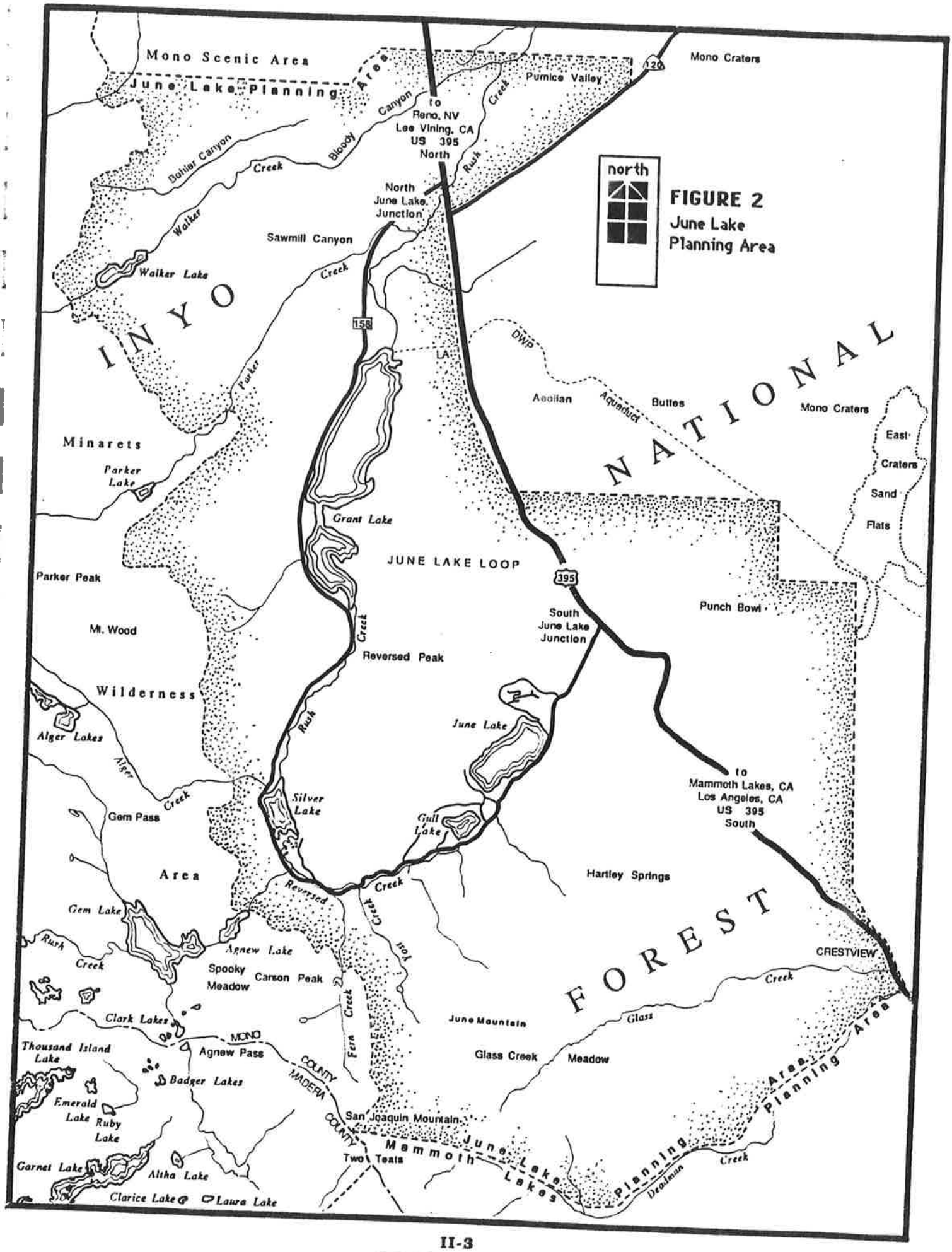
Figures & Maps

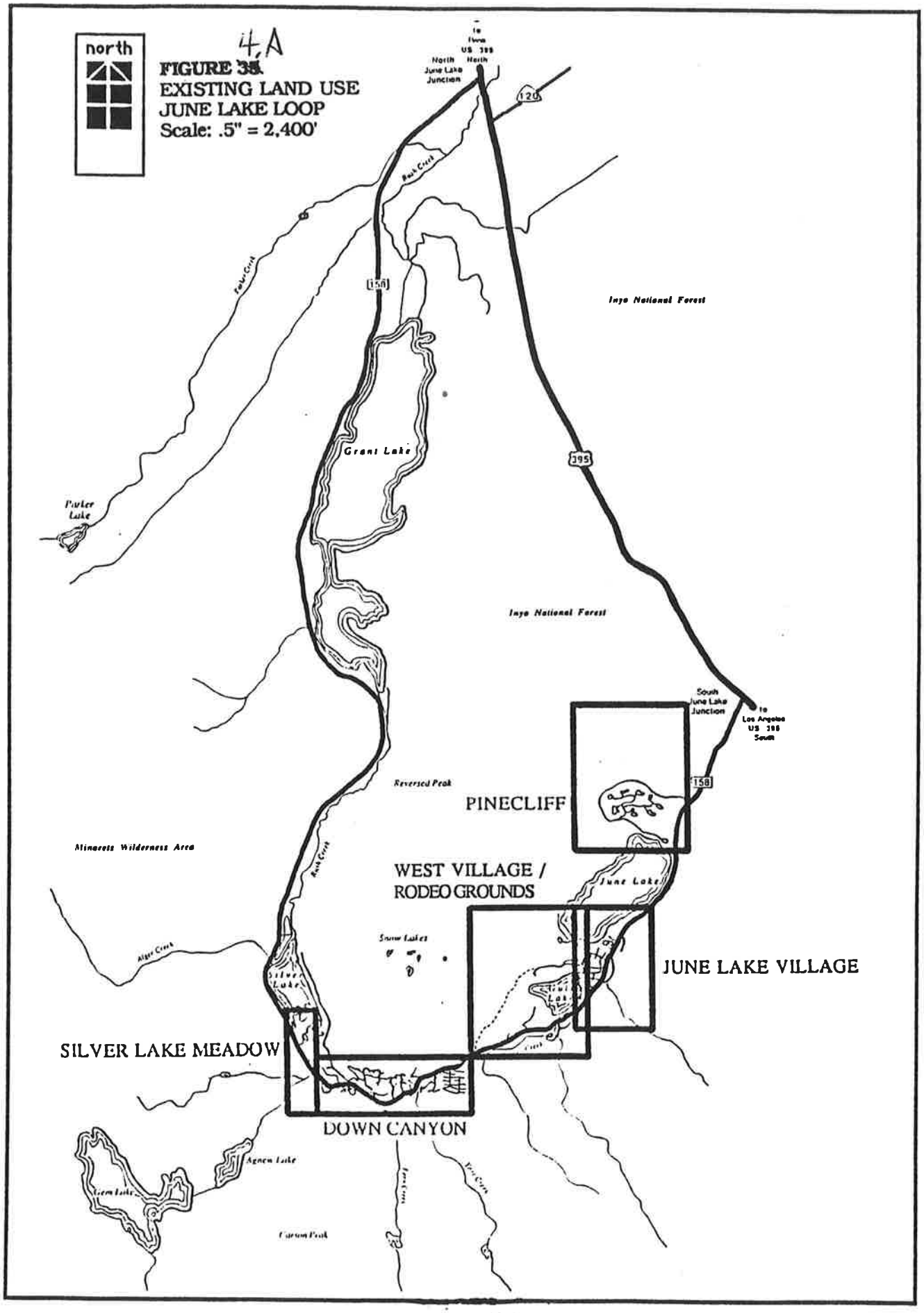


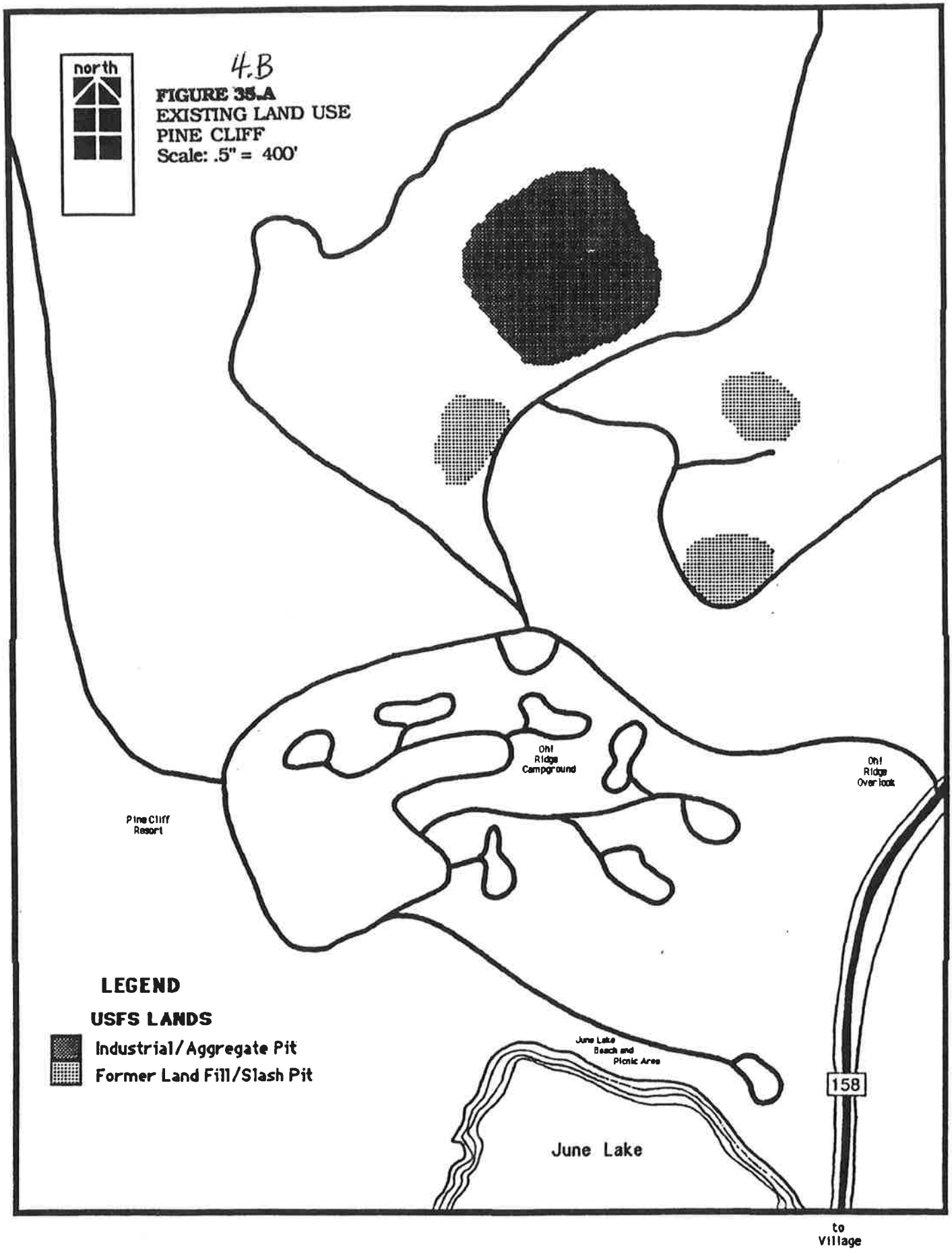
M O N O C O U N T Y

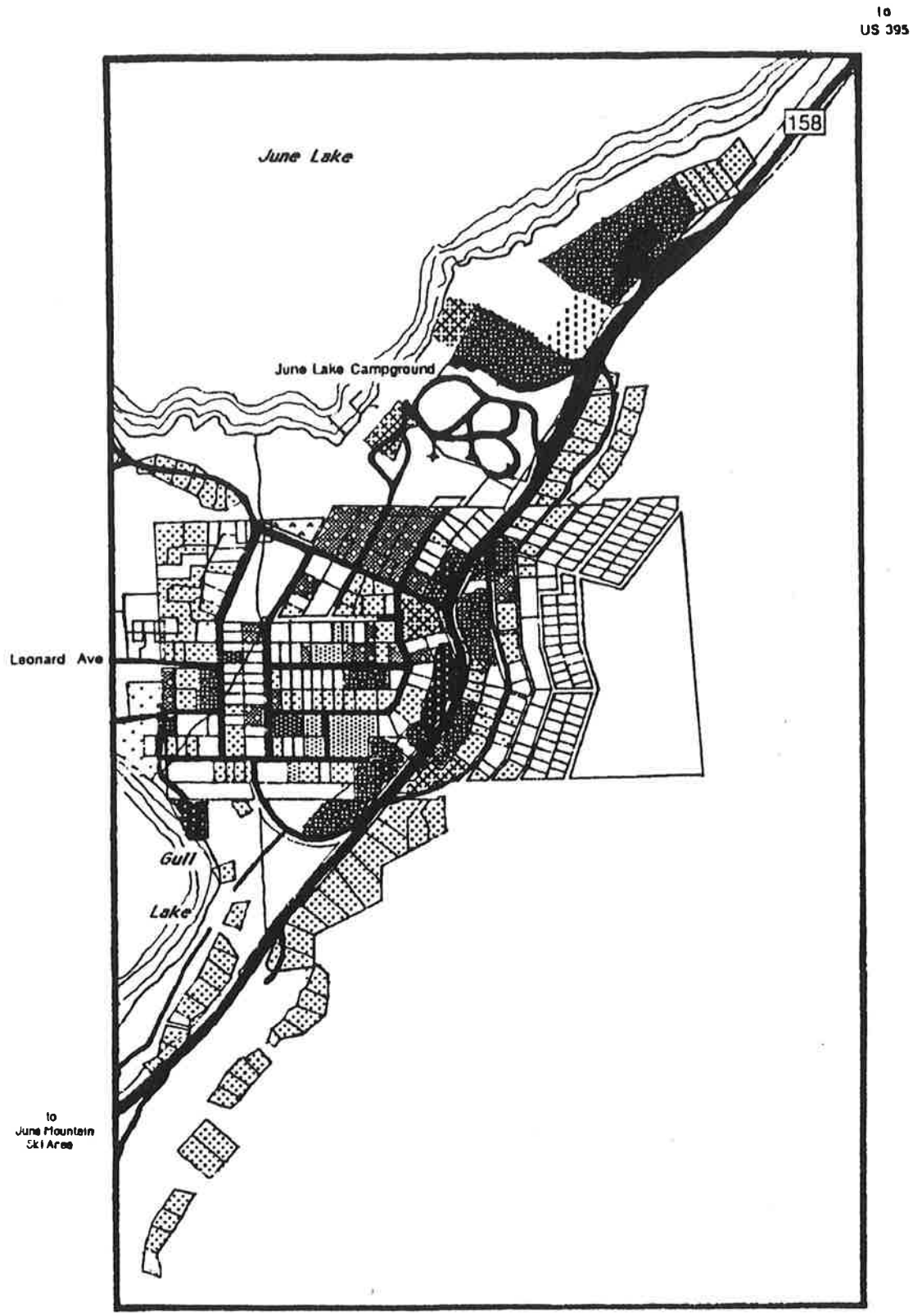
north

FIGURE 1
Vicinity Map


Mono Scenic Area
June Lake Planning Area
Mono Craters
Pumice Valley
to
Reno, NV
Lee Vining, CA
US 395
North
Bloody Canyon
Rush Creek
Bohler Canyon
Walker Creek
North June Lake Junction
Sawmill Canyon
Walker Lake
Parker Creek
INYO
NATIONAL
FOREST
158
LA
DWP
Aqueduct
Aeolian Buttes
Mono Craters
East Craters Sand Flats
Minarets
Parker Lake
Grant Lake
JUNE LAKE LOOP
Parker Peak
395
Punch Bowl
South June Lake Junction
Mt. Wood
Reversed Peak
Wilderness
Alger Lakes
Alger Creek
Rush Creek
June Lake
to
Mammoth Lakes, CA
Los Angeles, CA
US 395
South
Gem Pass
Silver Lake
Gull Lake
Area
Hartley Springs
Reversed Creek
Gem Lake
Rush Creek
Agnew Lake
Spooky Meadow
Carson Peak
Fern Creek
Mono Creek
CRESTVIEW
Clark Lakes
June Mountain
Glass Creek Meadow
Thousand Island Lake
MONO
Agnew Pass
COUNTY
MADERA
COUNTY
Badger Lakes
Emerald Lake
Ruby Lake
San Joaquin Mountain
Mammoth Lakes
June Lake
Planning Area
Garnet Lake
Two Teats
Altha Lake
Clarice Lake
Laura Lake
Deadman Creek
north
FIGURE 2
June Lake
Planning Area

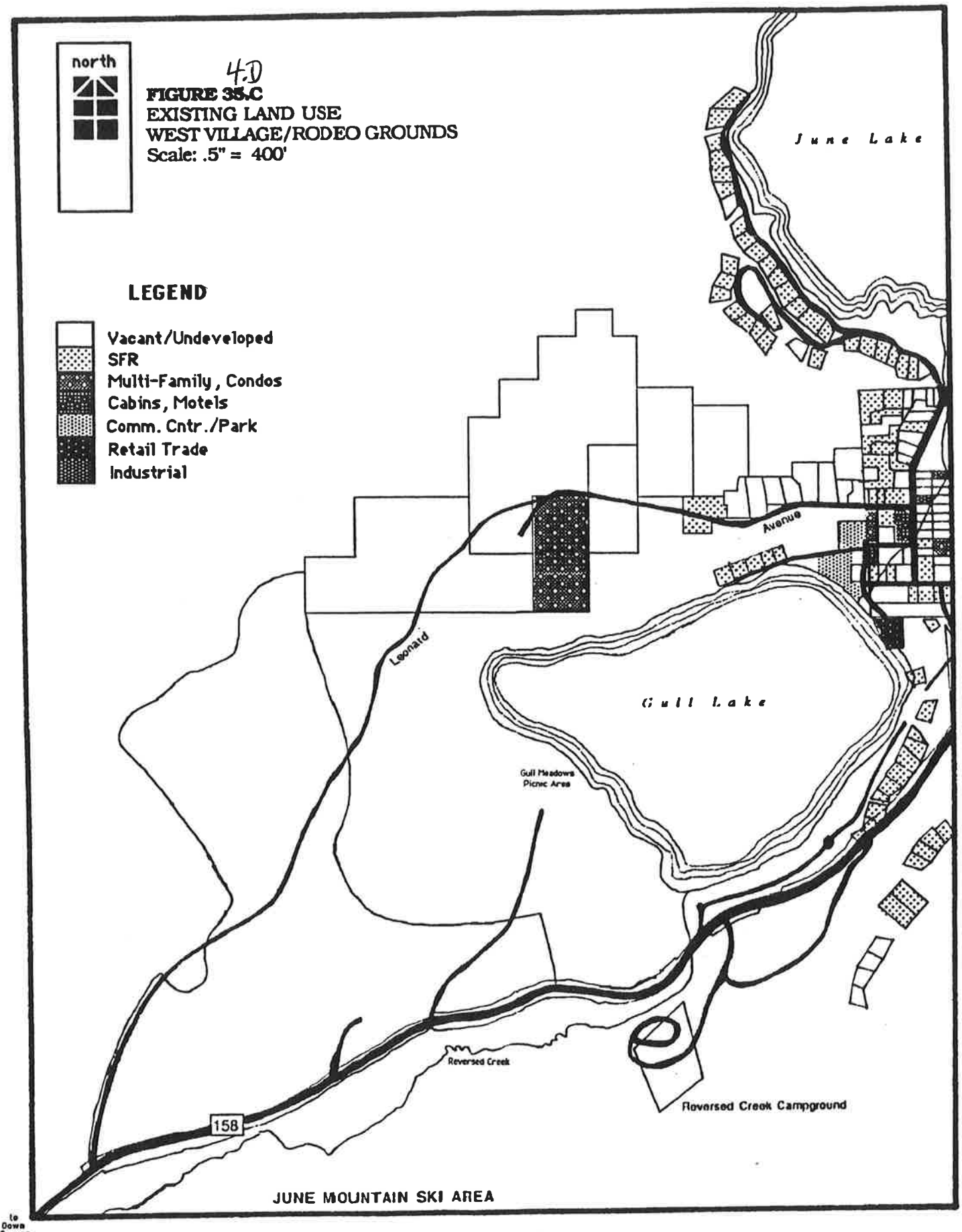

north
4,A
FIGURE 35
EXISTING LAND USE
JUNE LAKE LOOP
Scale: .5" = 2,400'
North June Lake Junction
120
Rush Creek
Fern Creek
158
Inyo National Forest
Grant Lake
395
Parker Lake
Inyo National Forest
South June Lake Junction
to Los Angeles US 395 South
Reversed Peak
158
PINECLIFF
Minarets Wilderness Area
Rush Creek
WEST VILLAGE / RODEO GROUNDS
June Lake
Snow Lakes
Agnew Creek
Silver Lake
JUNE LAKE VILLAGE
SILVER LAKE MEADOW
DOWN CANYON
Agnew Lake
Gem Lake
Carson Peak
Fern Creek

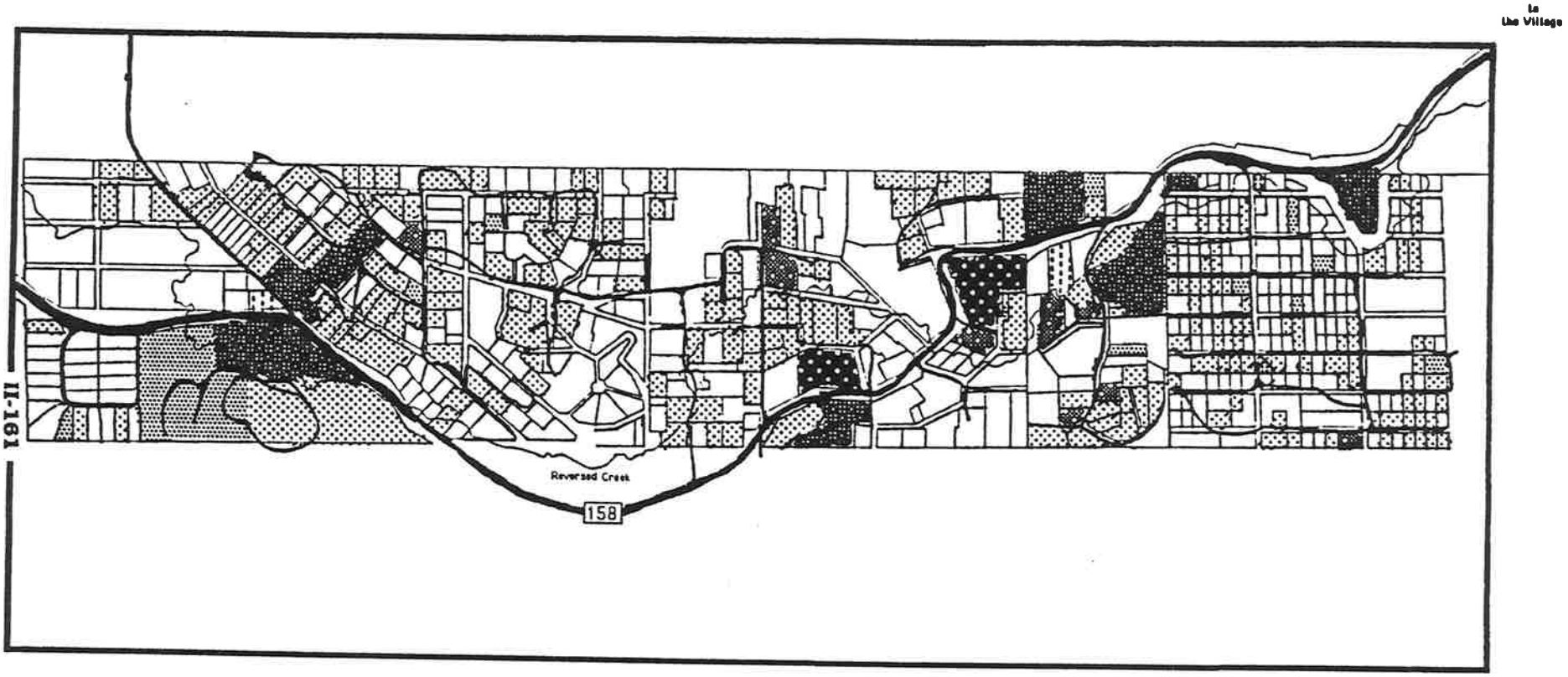

north
4.B
FIGURE 35.A
EXISTING LAND USE
PINE CLIFF
Scale: .5" = 400'
Ohl Ridge Campground
Ohl Ridge Overlook
Pine Cliff Resort
LEGEND
USFS LANDS
Industrial/Aggregate Pit
Former Land Fill/Slash Pit
June Lake Beach and Picnic Area
158
June Lake
to Village



4.C

FIGURE 35.B
EXISTING LAND USE
JUNE LAKE VILLAGE
Scale: .5" = 400'


north
4.D
FIGURE 35.C
EXISTING LAND USE
WEST VILLAGE/RODEO GROUNDS
Scale: .5" = 400'
LEGEND
Vacant/Undeveloped
SFR
Multi-Family, Condos
Cabins, Motels
Comm. Cntr./Park
Retail Trade
Industrial
June Lake
Avenue
Leonard
Gull Lake
Gull Meadows
Picnic Area
Reversed Creek
Reversed Creek Campground
158
JUNE MOUNTAIN SKI AREA
to the Village
to
Down
Canyon



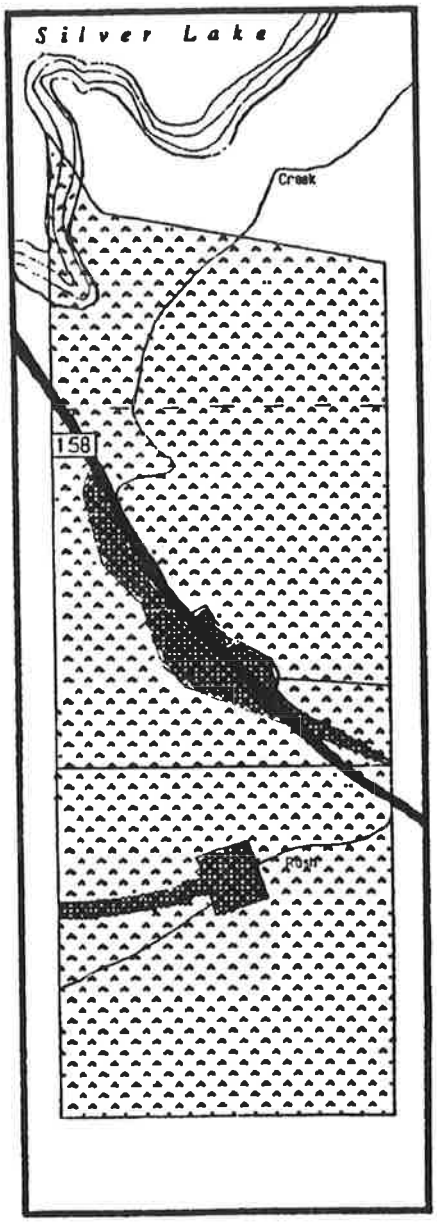
north

4.E

FIGURE 35.~~D~~
EXISTING LAND USE
DOWN CANYON
Scale: .5" = 400'

LEGEND

- Vacant/Undeveloped
- SFR
- Multi-Family, Condos
- Cabins, Motels
- Trailers
- Neighborhood Commercial
- Restaurant/Resort



to Silver Lake

to June Mountain Ski Area

north

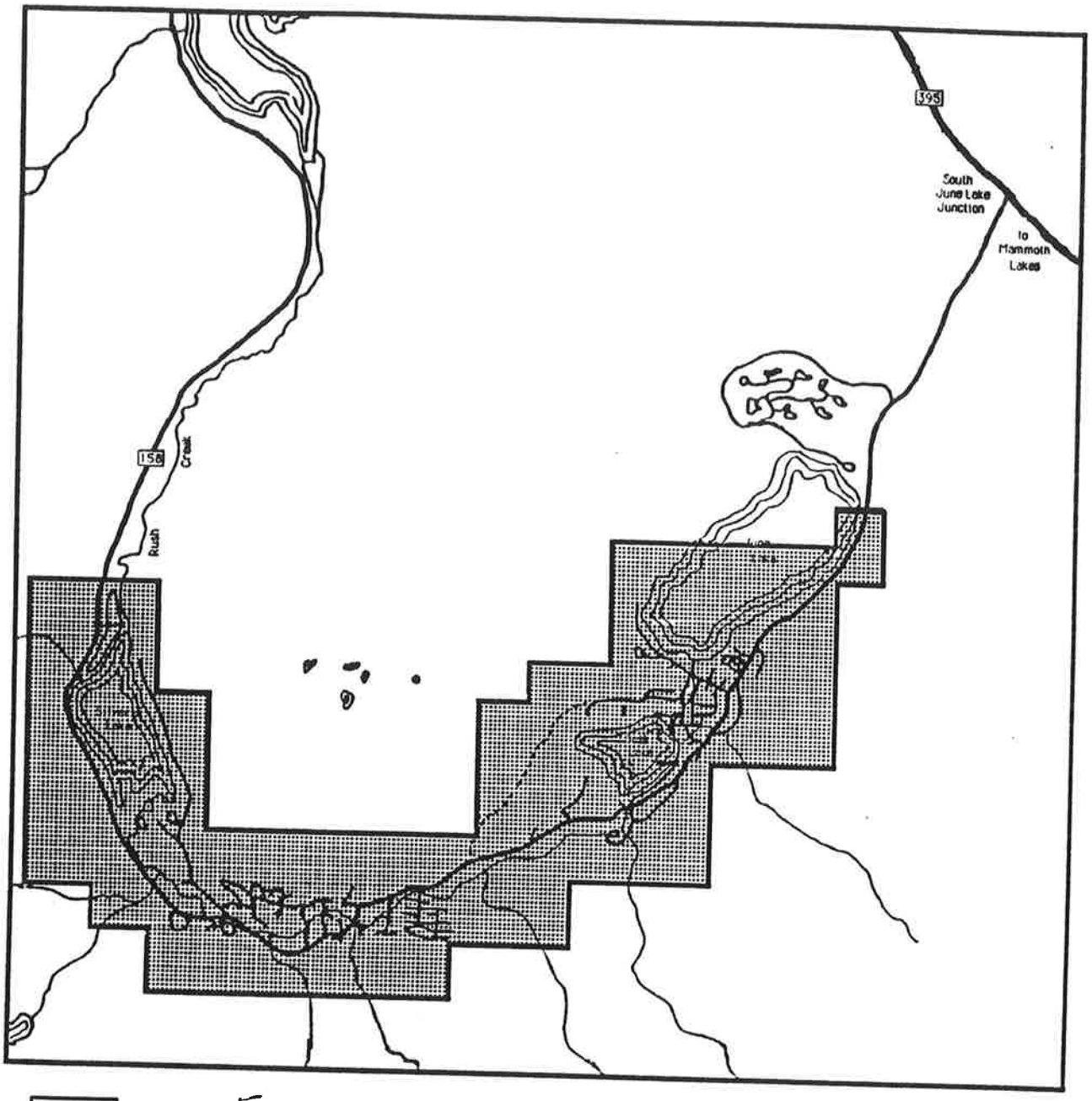
4.F

FIGURE 35.E
EXISTING LAND USE
SILVER LAKE MEADOW
Scale: .5" = 400'

LEGEND

Natural Habitat Protection

Public Facility



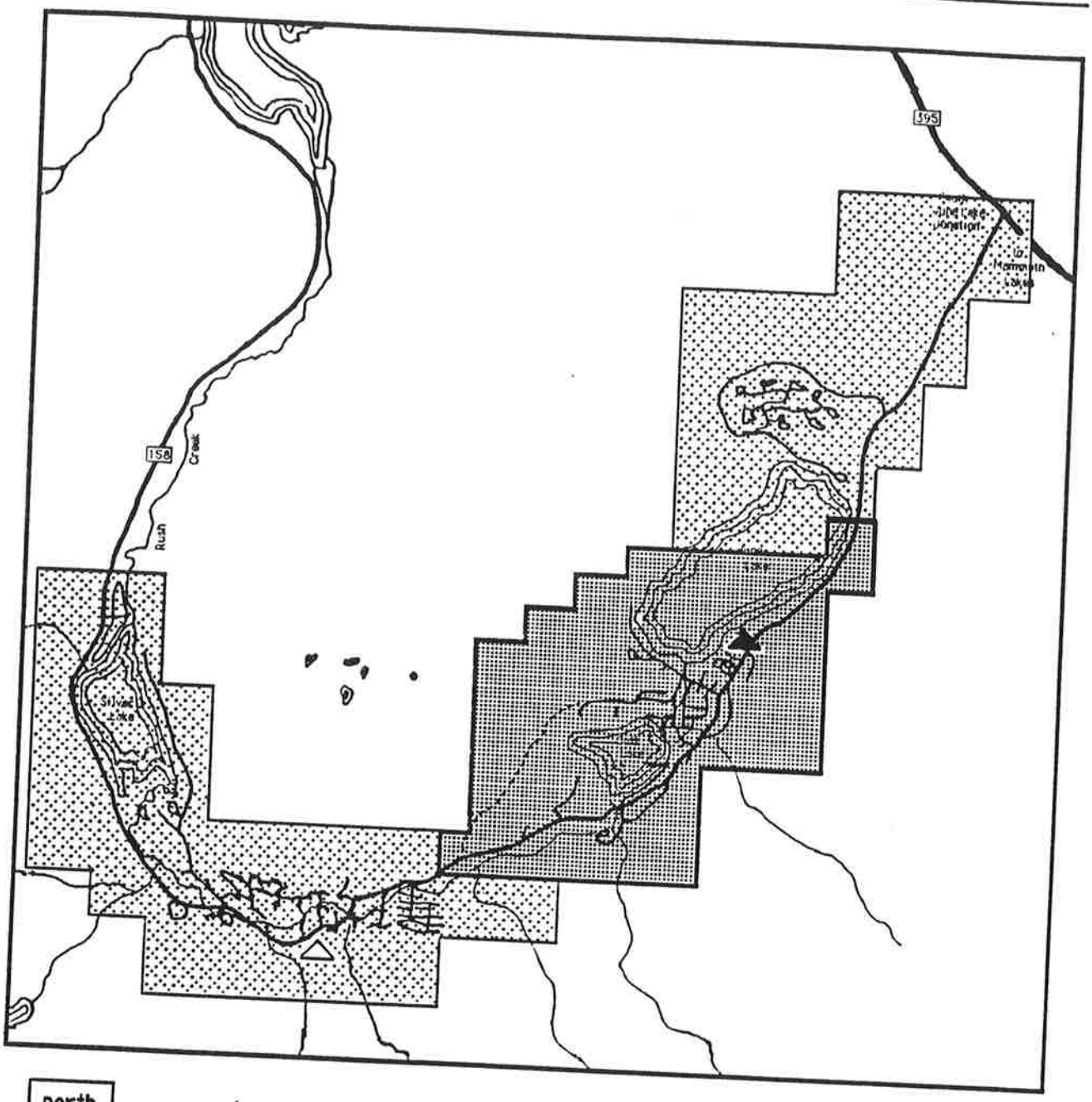
north

FIGURE 32
JLPUD SERVICE AREA
Scale: .5"= 1,400'

SOURCE: Mono County, 1987.

LEGEND

JLPUD District Boundaries



north

FIGURE 22
JLFPD SERVICE AREA & SPHERE OF INFLUENCE
Scale: .5"= 1,400'

LEGEND

- Fire Protection District
- Sphere of Influence
- Fire Station
- Paramedics/Search and Rescue
- Proposed Fire Station - Down Canyon

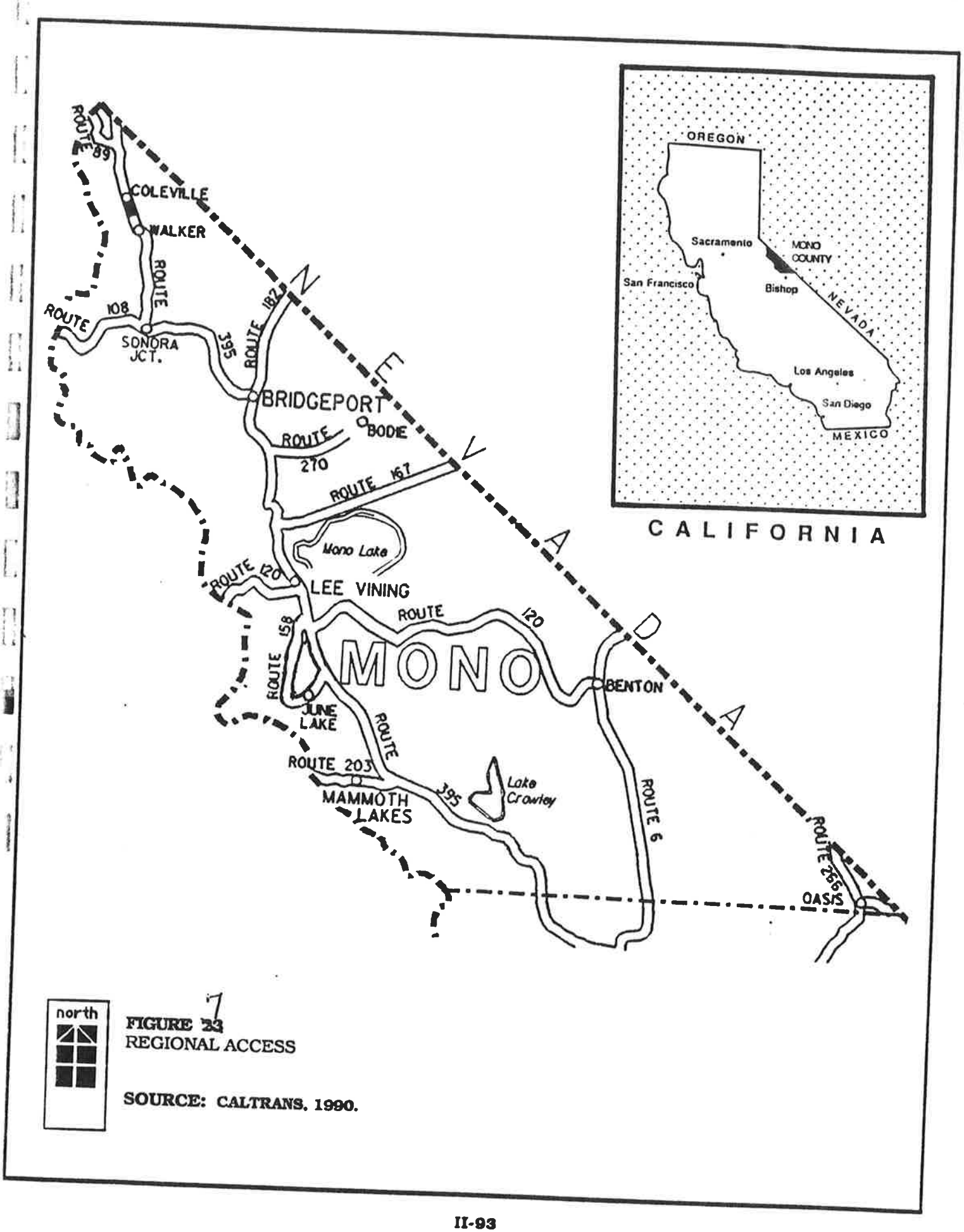


FIGURE 23
REGIONAL ACCESS

SOURCE: CALTRANS. 1990.

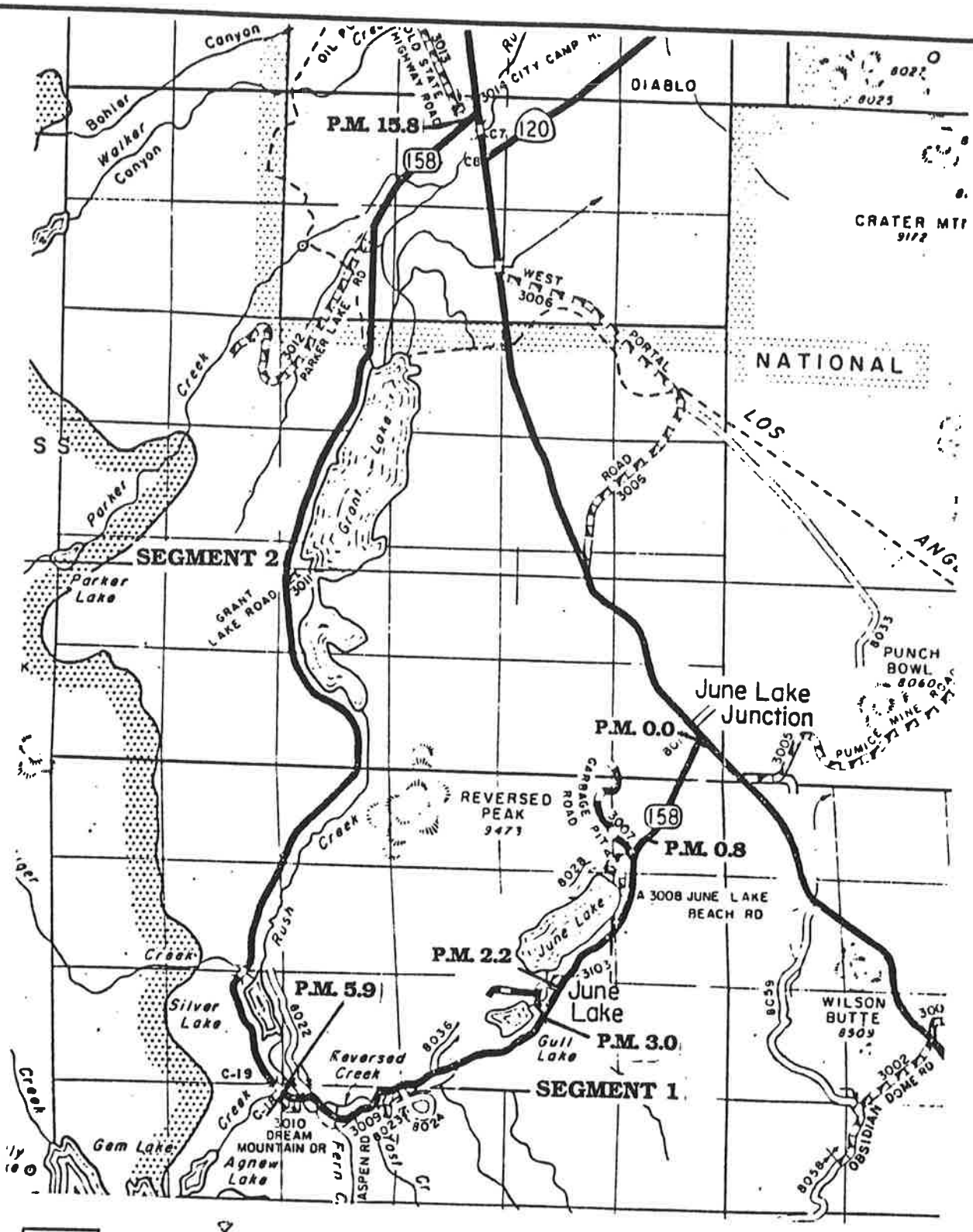
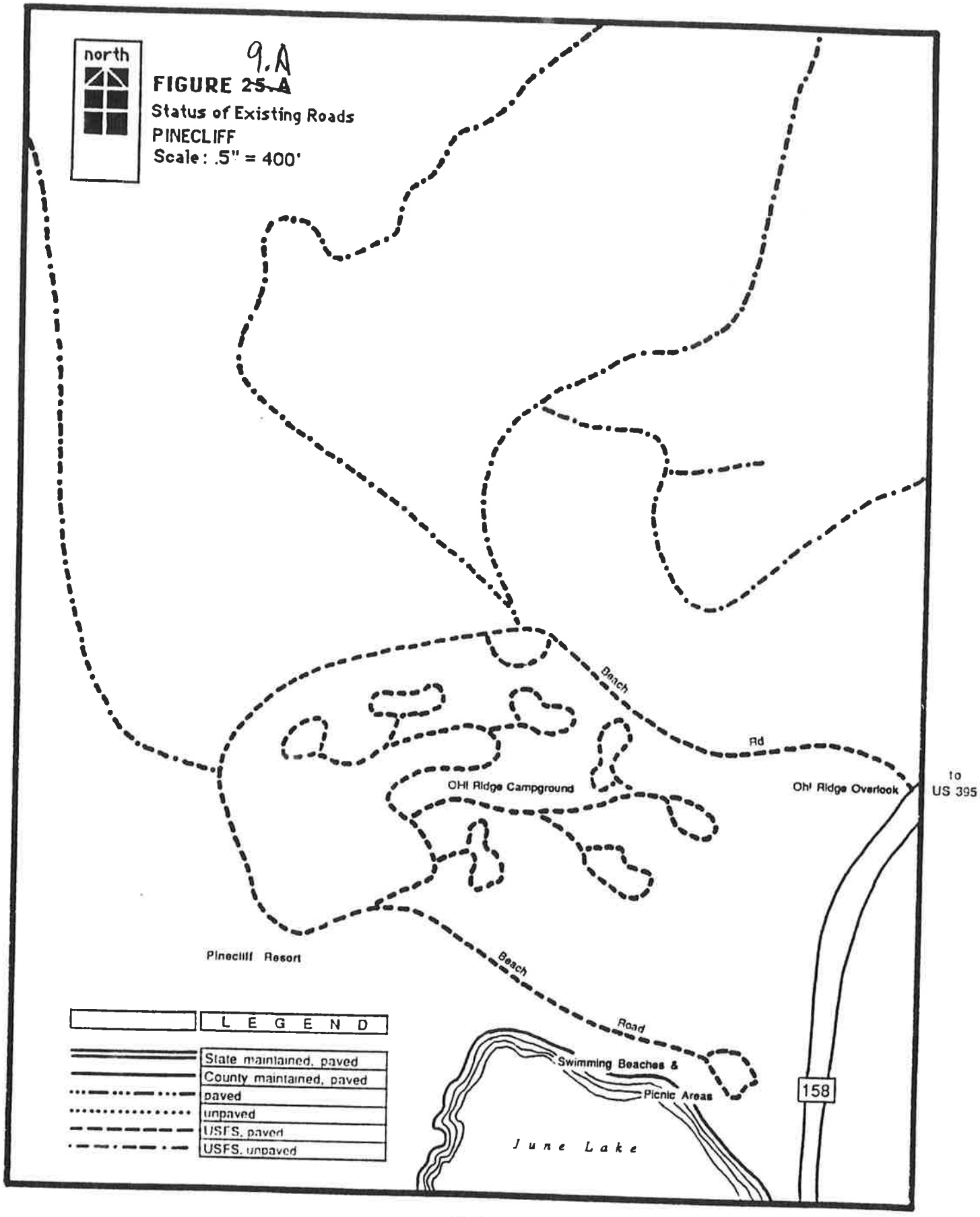


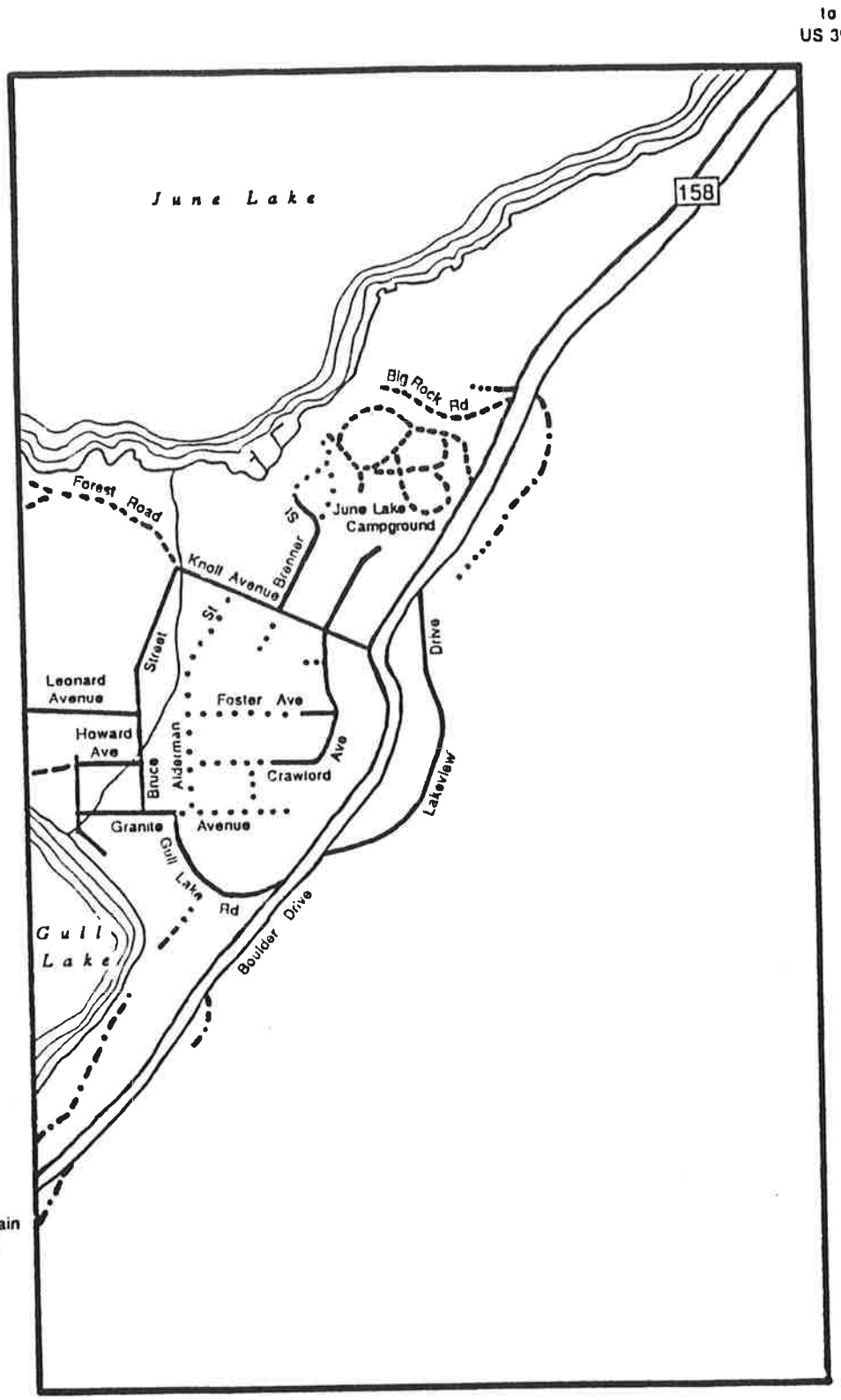
FIGURE 8
STATE ROUTE 158

SOURCE: CALTRANS.

LEGEND

SEGMENT 1 -- P.M. 0.0 to P.M. 5.9
CENTRAL BUSINESS DISTRICT -- P.M. 2.2 TO P.M. 3.0
SEGMENT 2 -- P.M. 5.9 TO P.M. 15.8

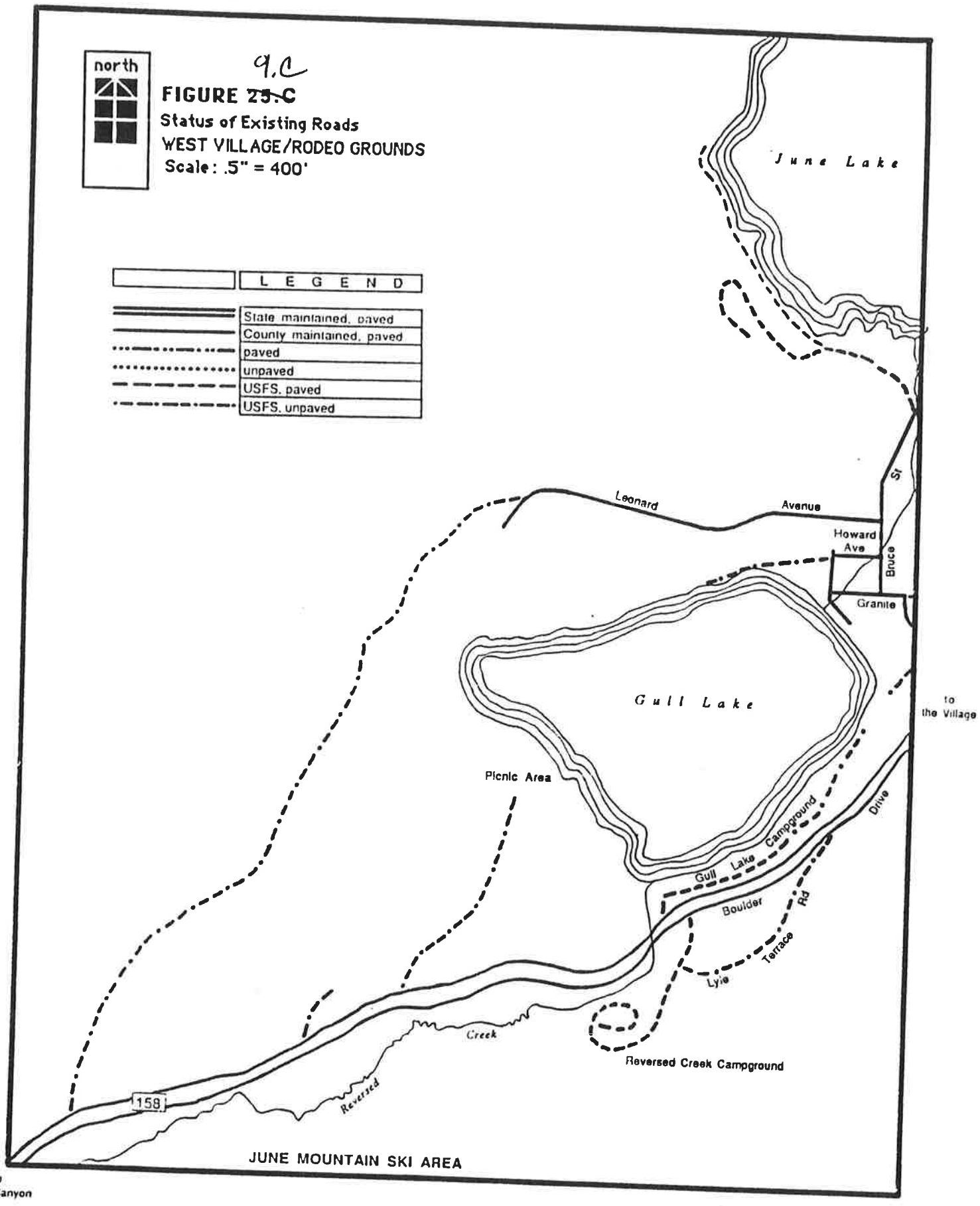

north
9.A
FIGURE 25-A
Status of Existing Roads
PINECLIFF
Scale: .5" = 400'
Beach
Rd
Oh! Ridge Campground
Oh! Ridge Overlook
to
US 395
Pinecliff Resort
Beach
Road
Swimming Beaches &
Picnic Areas
158
June Lake
LEGEND
State maintained, paved
County maintained, paved
paved
unpaved
USFS, paved
USFS, unpaved

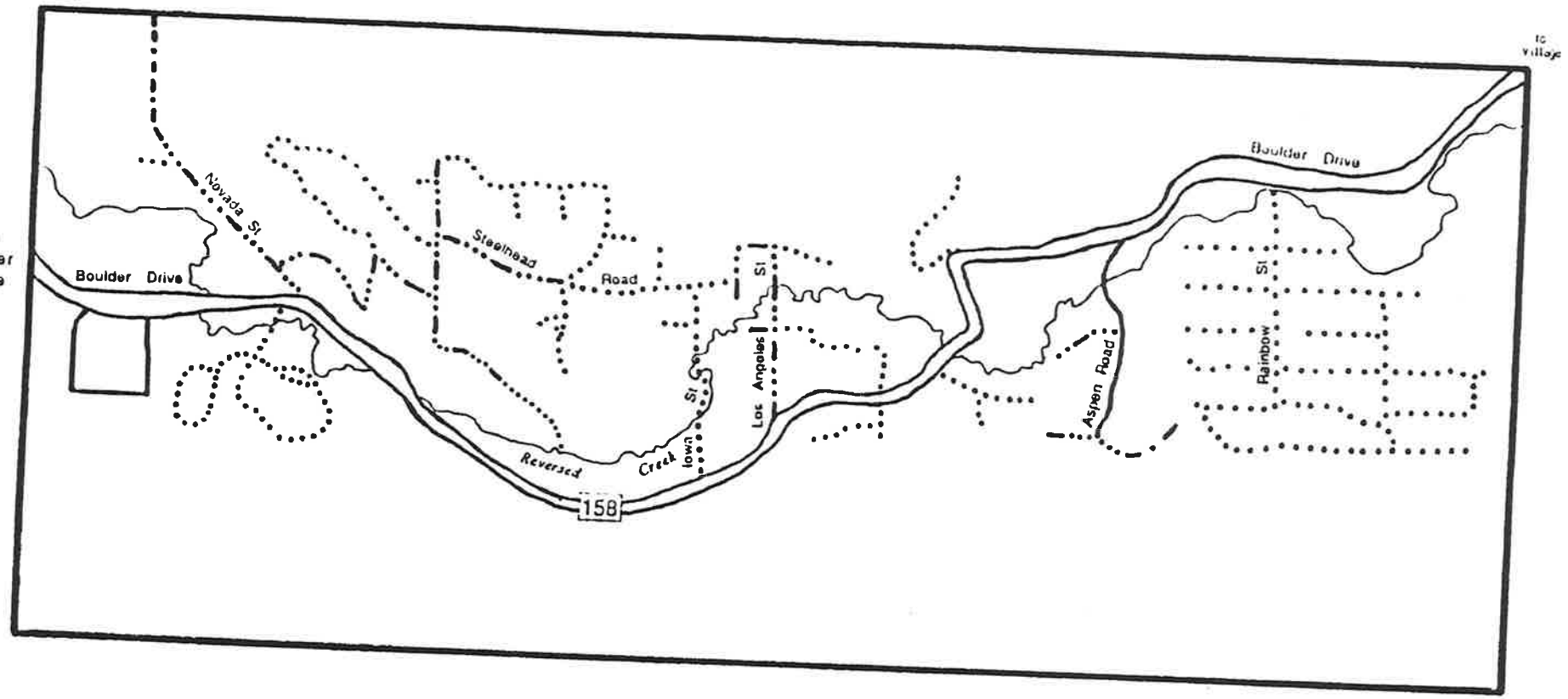


9.B

FIGURE ~~25.B~~

Status of Existing Roads
VILLAGE
Scale: .5" = 400'


north
9.C
FIGURE 25.C
Status of Existing Roads
WEST VILLAGE/RODEO GROUNDS
Scale: .5" = 400'
LEGEND
State maintained, paved
County maintained, paved
paved
unpaved
USFS, paved
USFS, unpaved
June Lake
Leonard
Avenue
Howard
Ave
Bruce
St
Granite
Gull Lake
to
the Village
Picnic Area
Gull Lake Campground
Drive
Boulder
Rd
Terrace
Lyle
Creek
Reversed Creek Campground
158
Reversed
JUNE MOUNTAIN SKI AREA
to
Down Canyon



north

9.D

FIGURE ~~25.D~~
Status of Existing Roads
DOWN CANYON
Scale: .5" = 400'

LEGEND
State maintained, paved
County maintained, paved
paved
unpaved
USFS, paved
USFS, unpaved

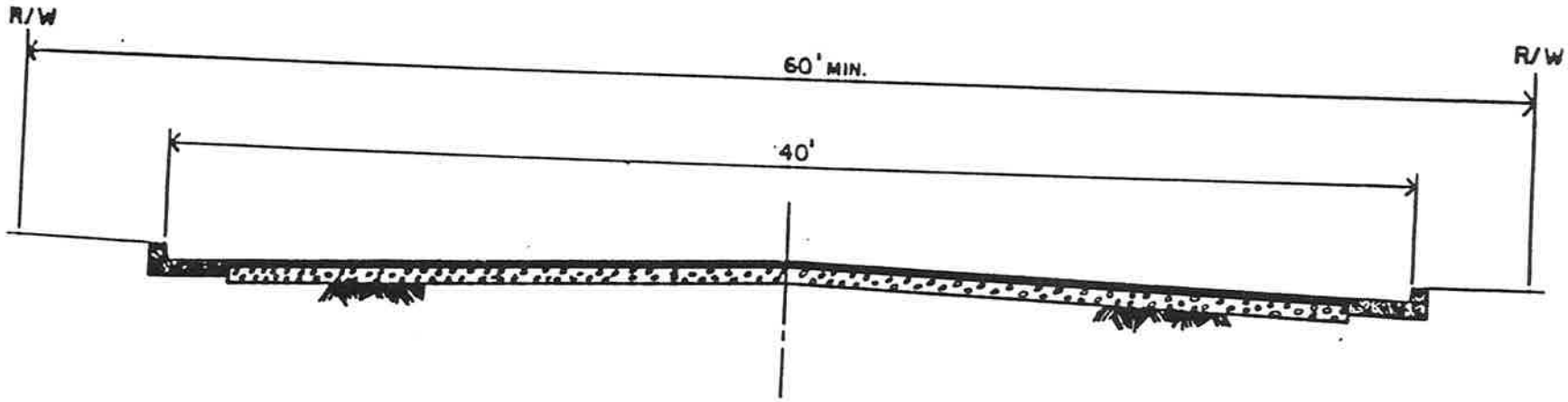


FIGURE ~~26~~ 10
JUNE LAKE TYPICAL SECTION ARTERIAL/ COMMERCIAL

SOURCE: Mono County, 1981.

NOTES:

1. Shall be a County maintained road.
2. Serves as Arterial/Commercial area road.
3. Road section shall be .25' A.C. min. with sufficient CL-2 aggregate base to accommodate a T.I. of 8.5 min.

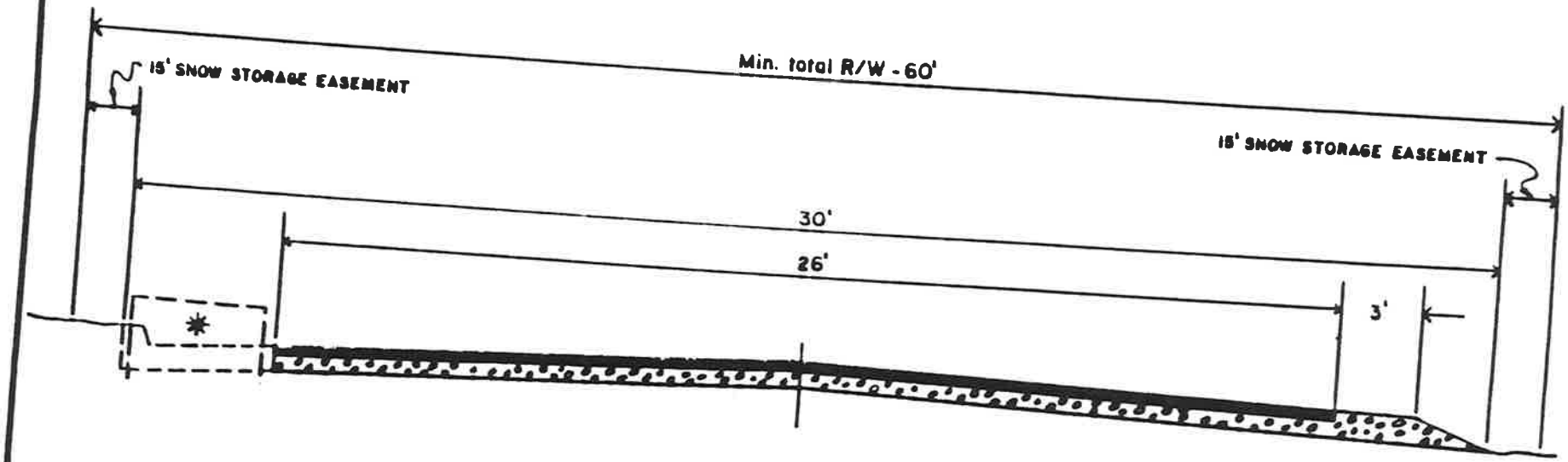
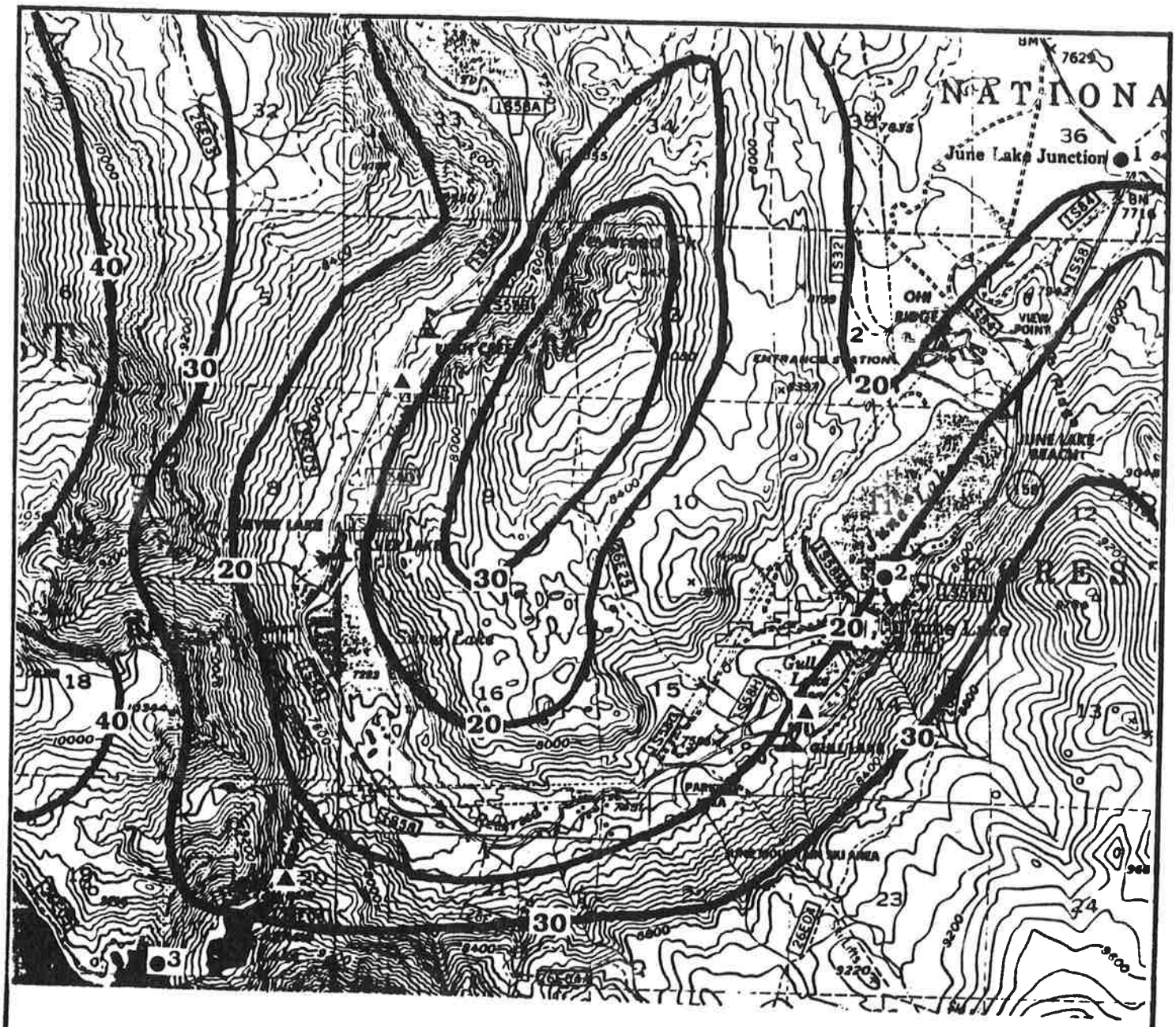


FIGURE II-27
JUNE LAKE TYPICAL SECTION
COLLECTOR/RESIDENTIAL

SOURCE: Mono County, 1981.

NOTES:

1. May be a County maintained road.
2. Serves any number of residential lots, and functions as aresidential collector.
3. Road section shall be .25' A.C. min. with sufficient CL-2 aggregate base to accommodate a T.I. of 6.5 min.



north

14

FIGURE X
ISOHYETAL MAP
(Average percipitation, Oct. 1951 - Sept. 1978)
SCALE: 1.25" = 5,280'

SOURCE: DWR, 1981.

LEGEND

●1 Percipitation Station
▲ Gaging Station

north

FIGURE 15
GEOLOGIC MAP

SOURCE: Kistler, 1966.

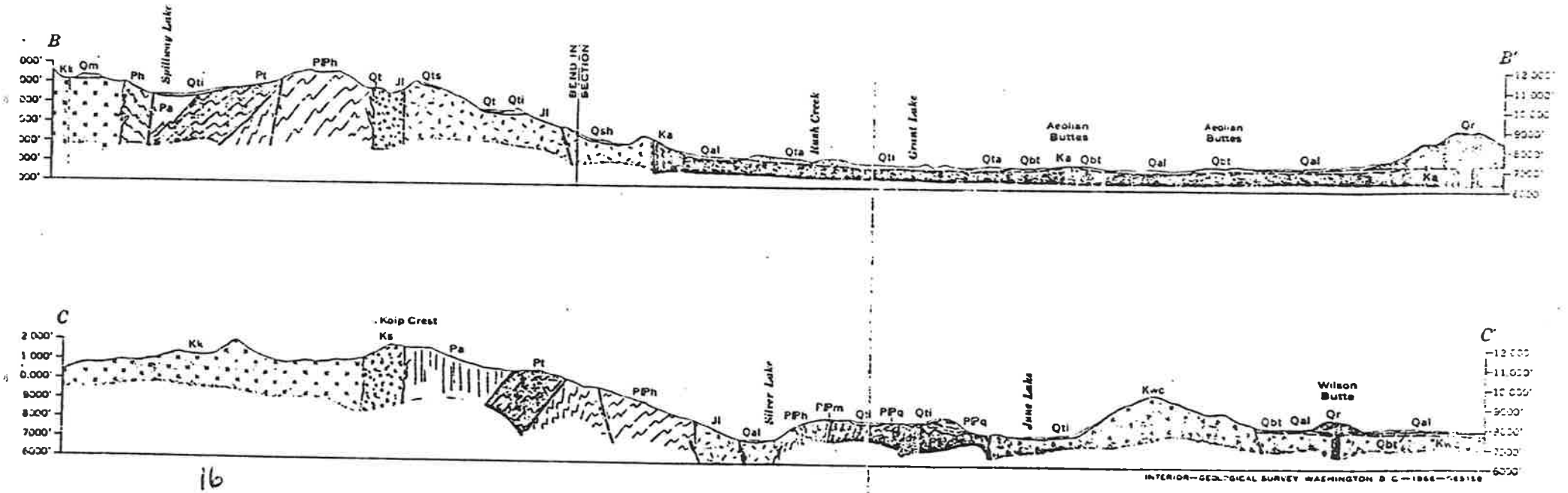


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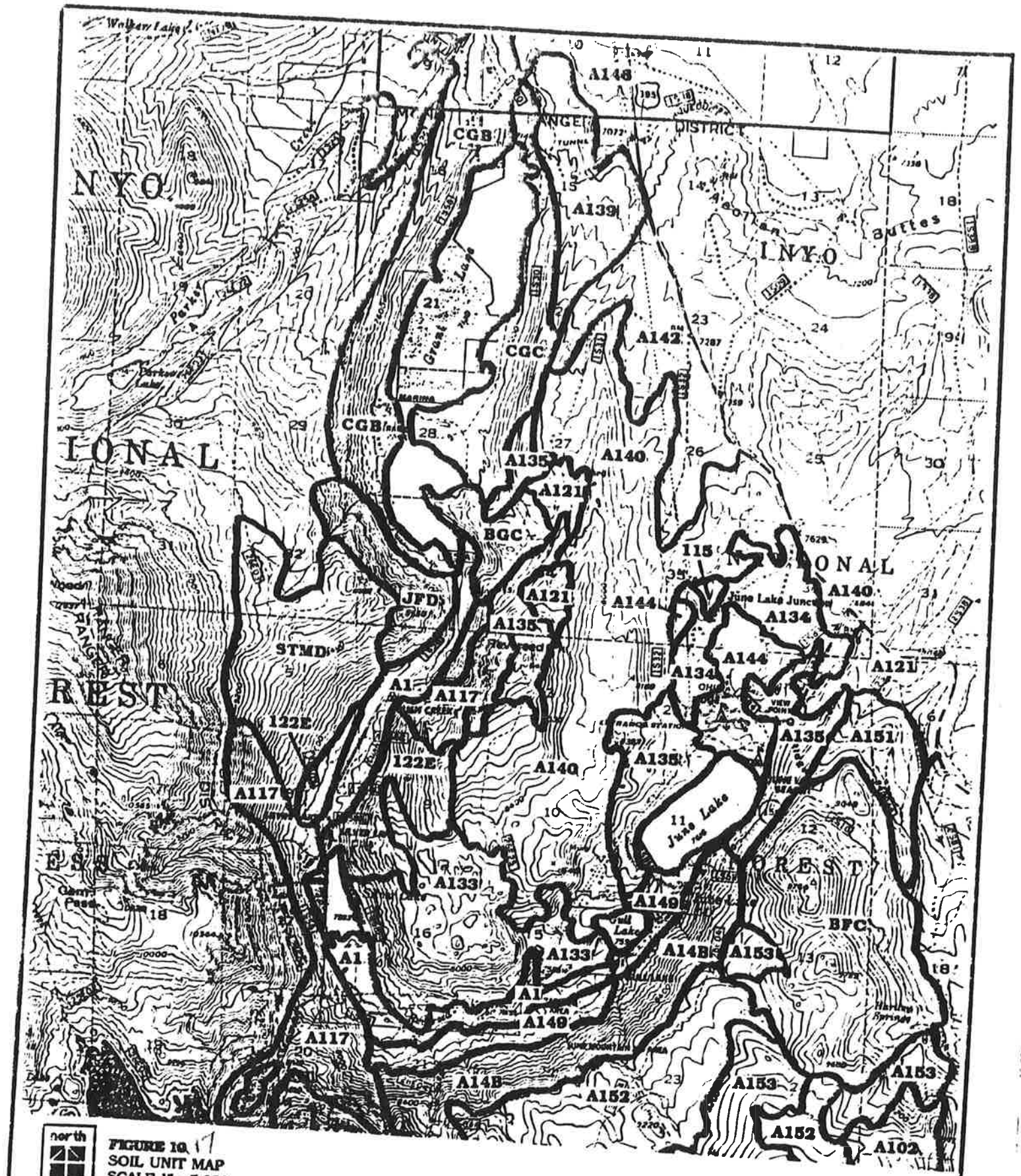
FIGURE 3 -- CROSS SECTION OF GEOLOGICAL FEATURES
SOURCE: Kistler, 1966.



north

FIGURE 10
SOIL UNIT MAP
SCALE 1" = 5,280'

SOURCE: USFS, 1987.

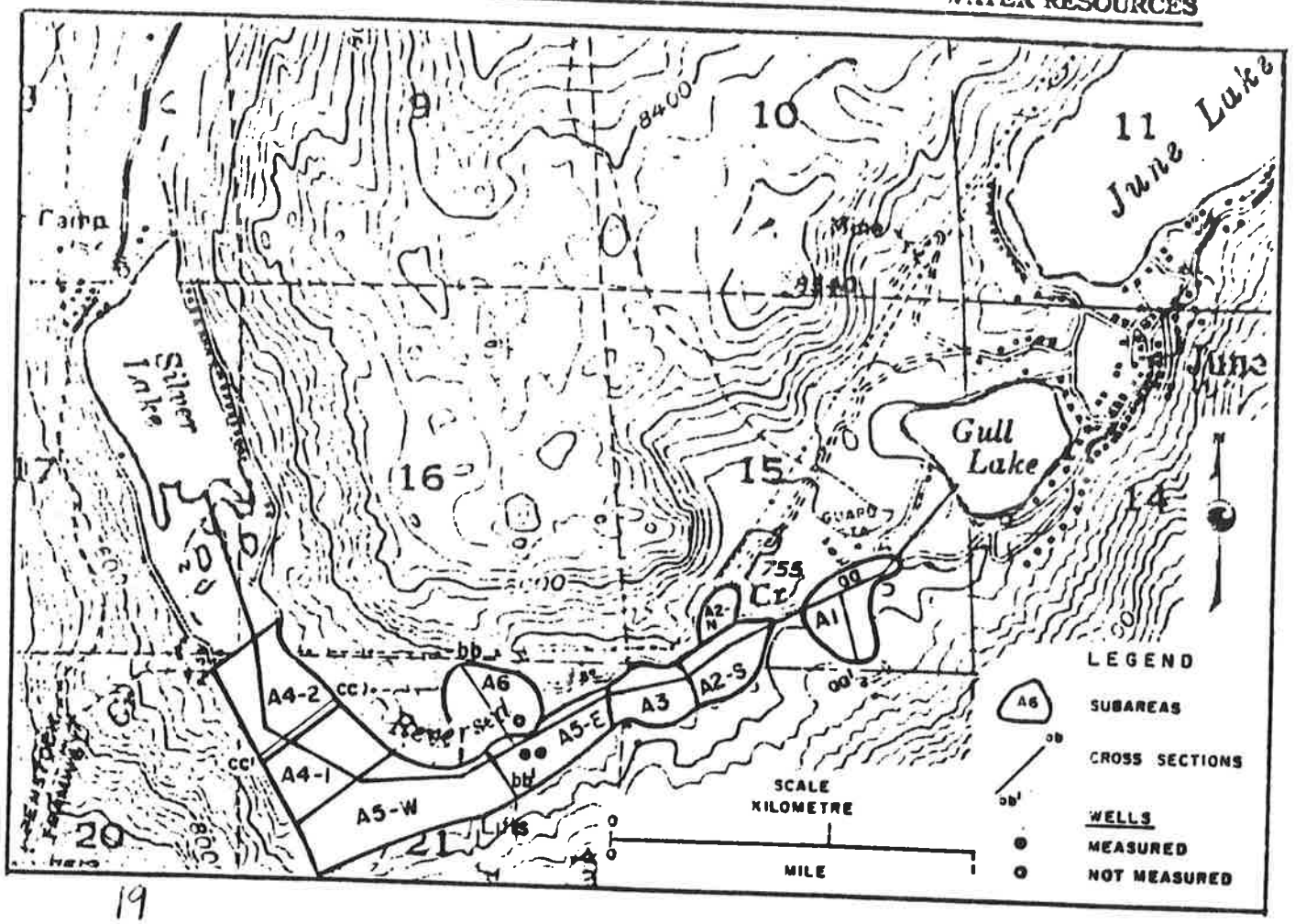


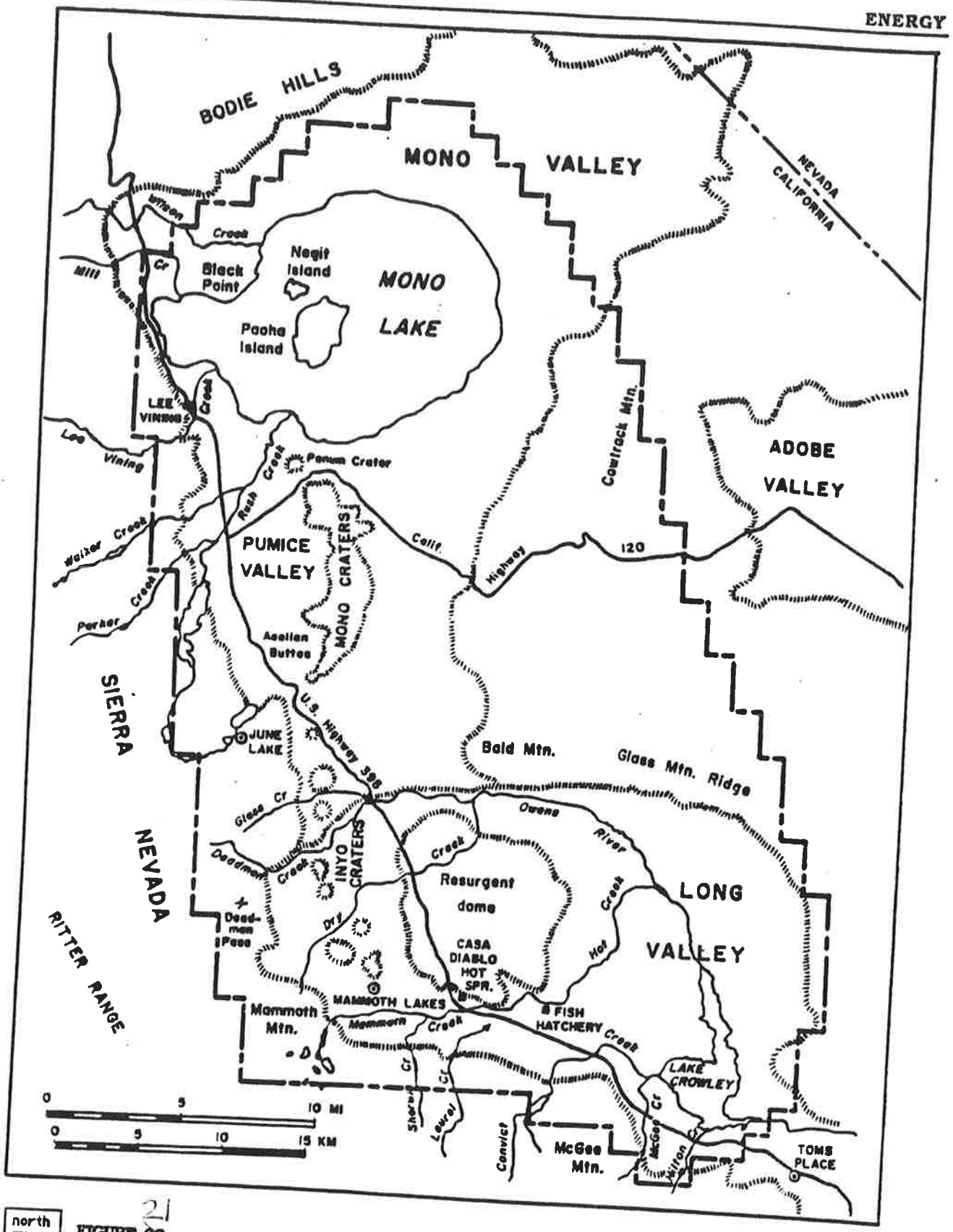
FIGURE 8 -- LOCATIONS OF GROUNDWATER SUBAREAS
SOURCE: DWR, 1981.

C. WATER QUALITY

JUNE, GULL AND SILVER LAKES

Biologically significant water quality information for the Loop's lakes and streams was collected during the June Lake Area Water Resource Assessment Study conducted by the California Department of Water Resources in 1977 and 1978. The study's results were published in **Water Quality Study - June Lake Loop**, 1979 by Randall L. Brown, California Department of Water Resources.

Water quality parameters examined during the studies included: 1) dissolved oxygen (DO) and temperature; 2) phytoplankton free floating algae and nutrients; 3) zooplankton (microscopic animals); 4) light penetration; and 5) dissolved minerals. The study focused on June, Gull and Silver Lakes and to a lesser extent Reversed and Rush Creeks. Table 6 describes the study sites. Analysis of the study's water quality data indicates that surface water in the June Lake Loop is of excellent quality for domestic



north

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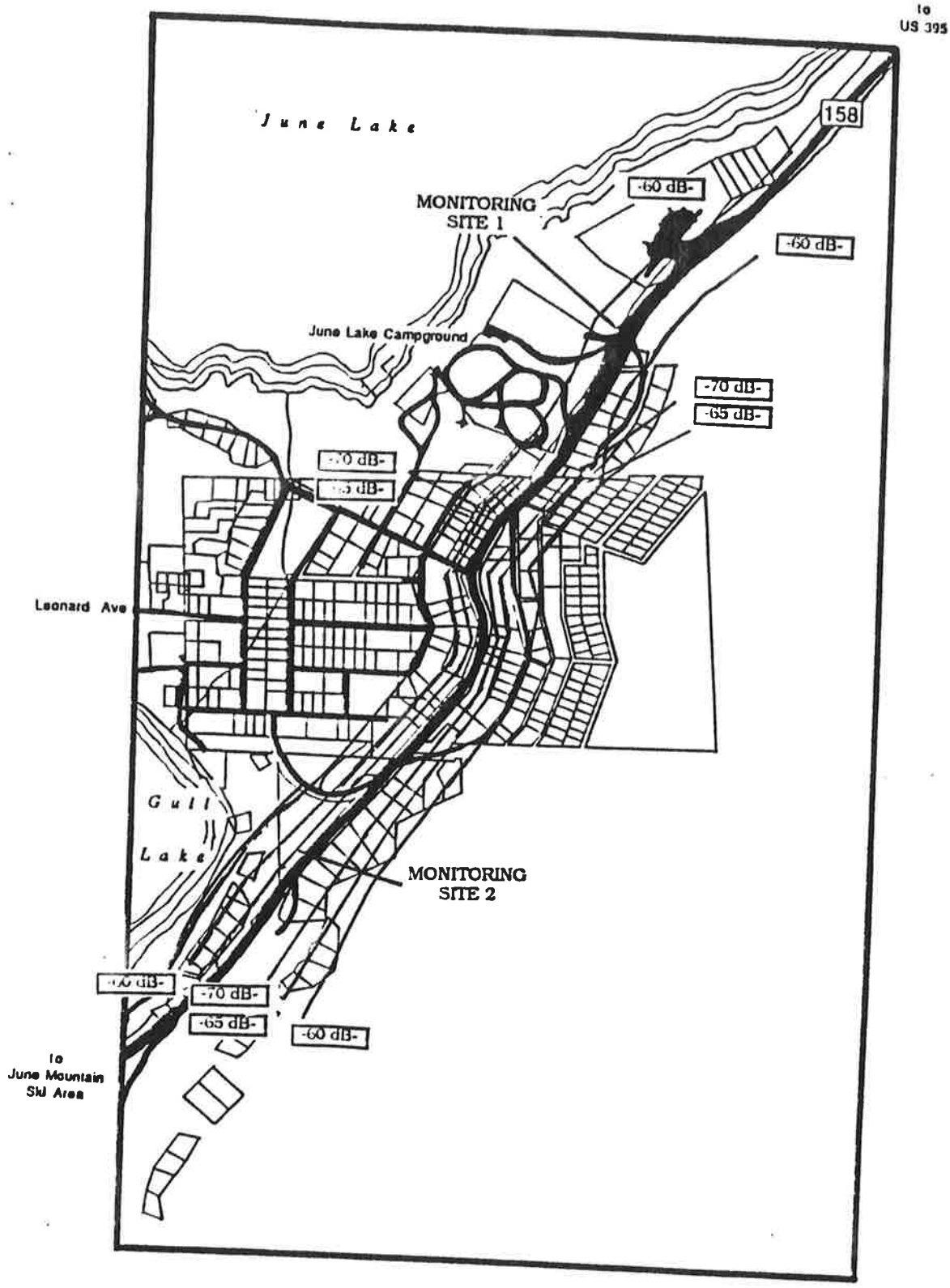
FIGURE 20
MONO-LONG VALLEY REGION
KNOWN GEOTHERMAL RESOURCE
AREA

SOURCE: Mono County, 1982.



north

FIGURE 28
JUNE LAKE VILLAGE
NOISE CONTOURS

Scale .5" = 400'

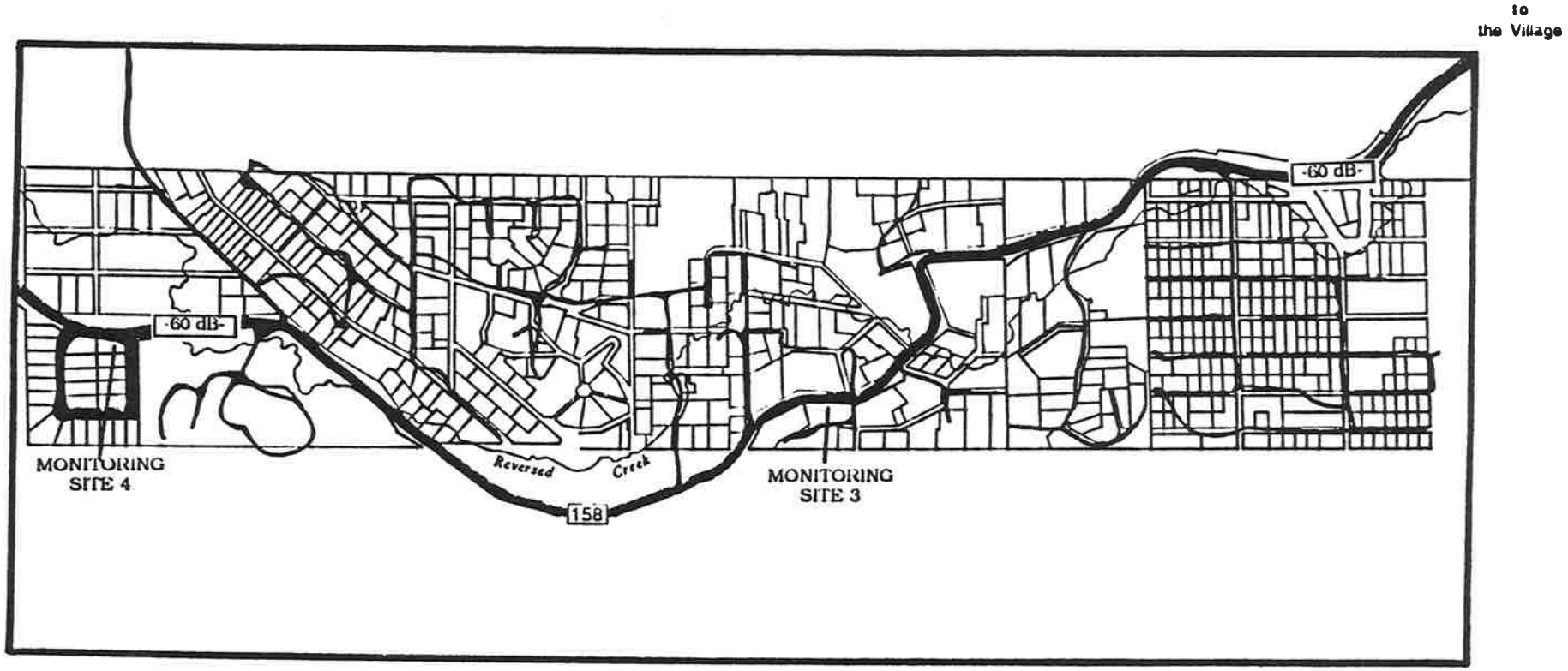
SOURCE: Mono County, 1981.

LEGEND

-60 dB- NOISE CONTOURS

SITE 1		SITE 2	
dB[1]	FT[2]	dB[1]	FT[2]
60	120	60	295
62[3]	50	65	150
		70	85
		71[3]	25

1. Ldn -- Decbels.
2. Distance from centerline.
3. Actual field reading.



north

23
FIGURE 29
DOWN CANYON AREA
NOISE CONTOURS

Scale .5" = 400'

SOURCE: Mono County, 1981.

LEGEND

-60 dB- NOISE CONTOUR

SITE 3		SITE 4	
dB[1]	FT[2]	dB[1]	FT[2]
61[3]	25	53[3]	45

1. Ldn -- Decbels.
2. Distance from centerline.
3. Actual field reading.

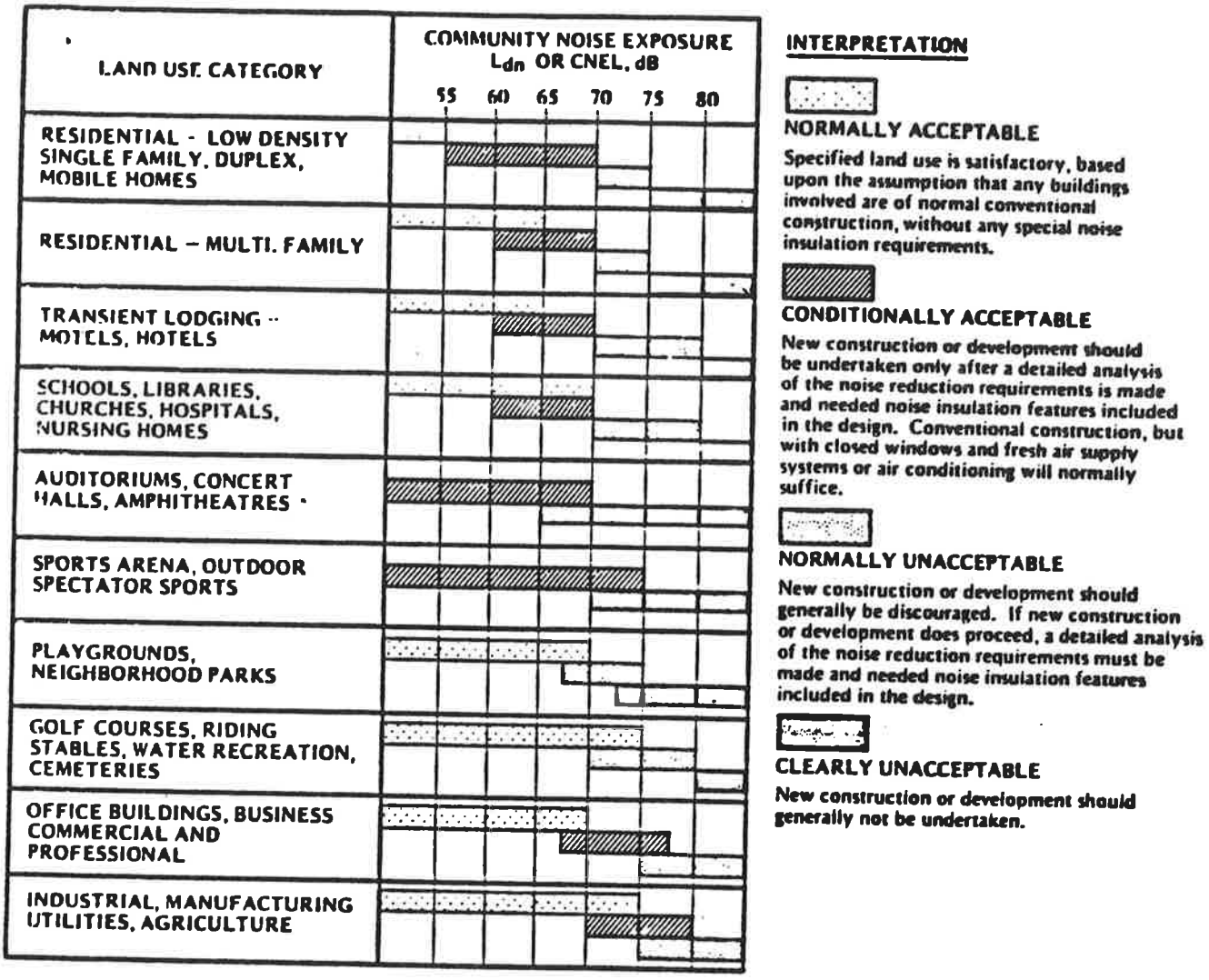
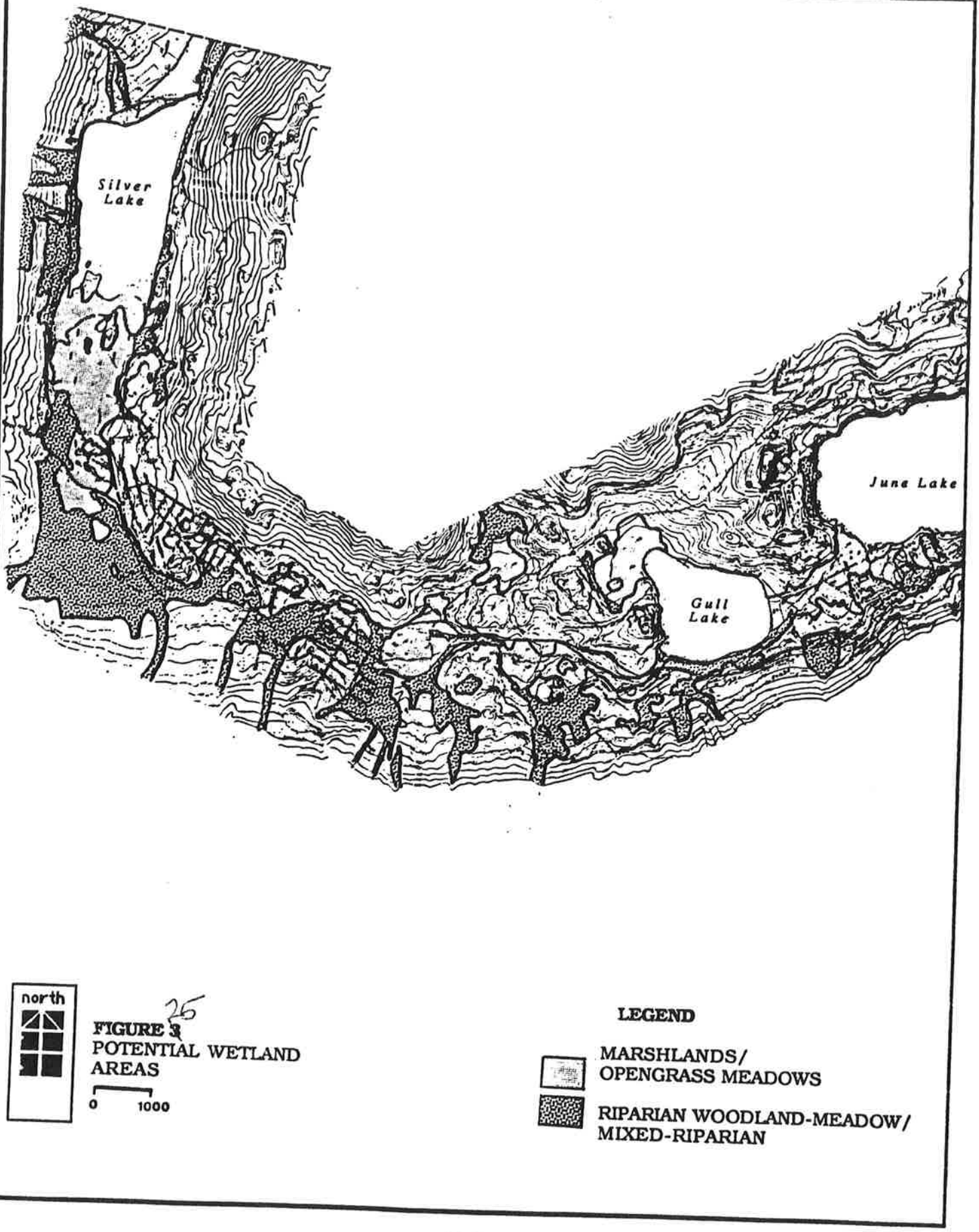


FIGURE 31 (24)
LAND USE COMPATIBILITY FOR COMMUNITY NOISE ENVIRONMENTS.

SOURCE: Office of Planning and Research, 1987.



25

FIGURE 3
POTENTIAL WETLAND AREAS

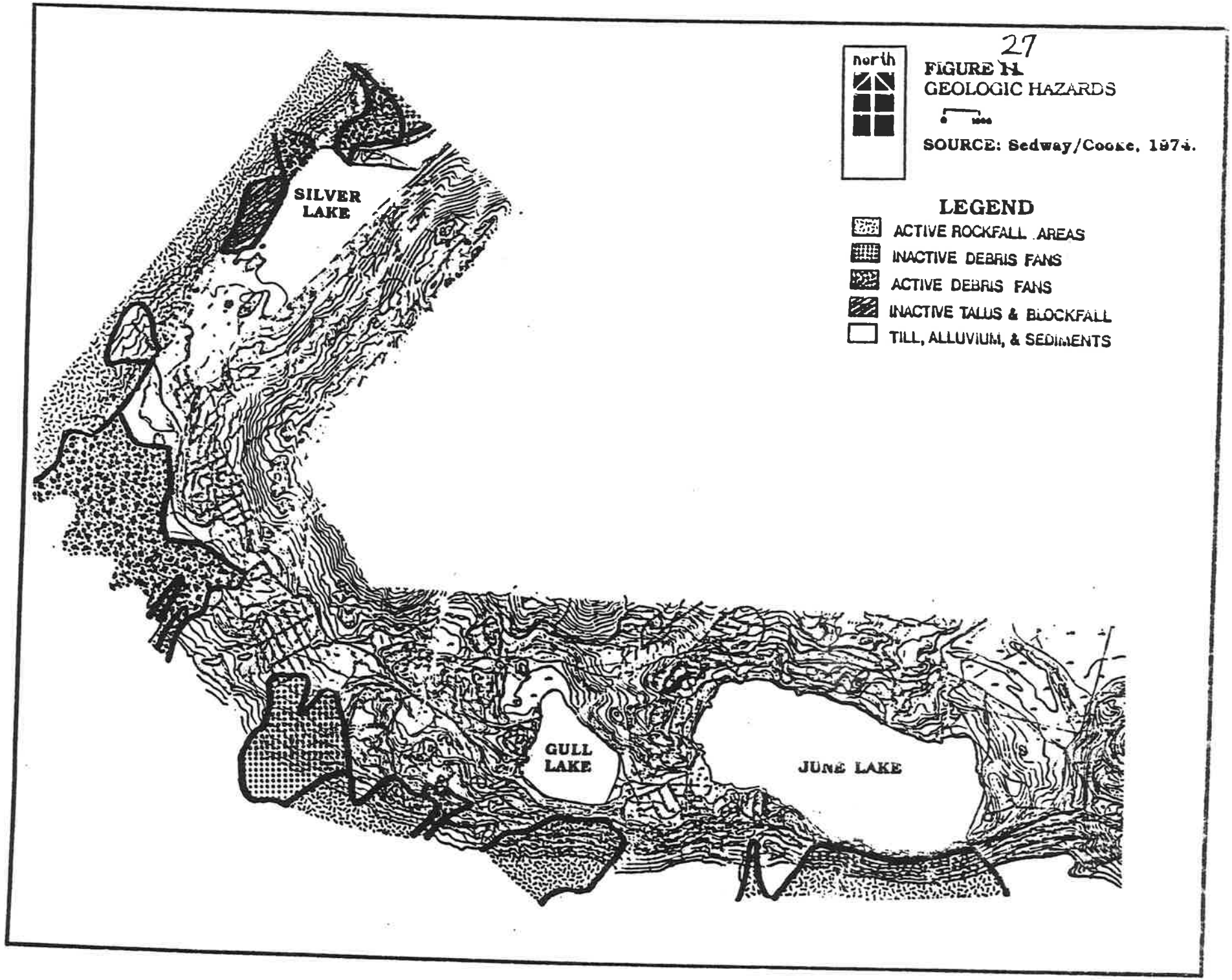


FIGURE H
GEOLOGIC HAZARDS

SOURCE: Sedway/Cooke, 1974.

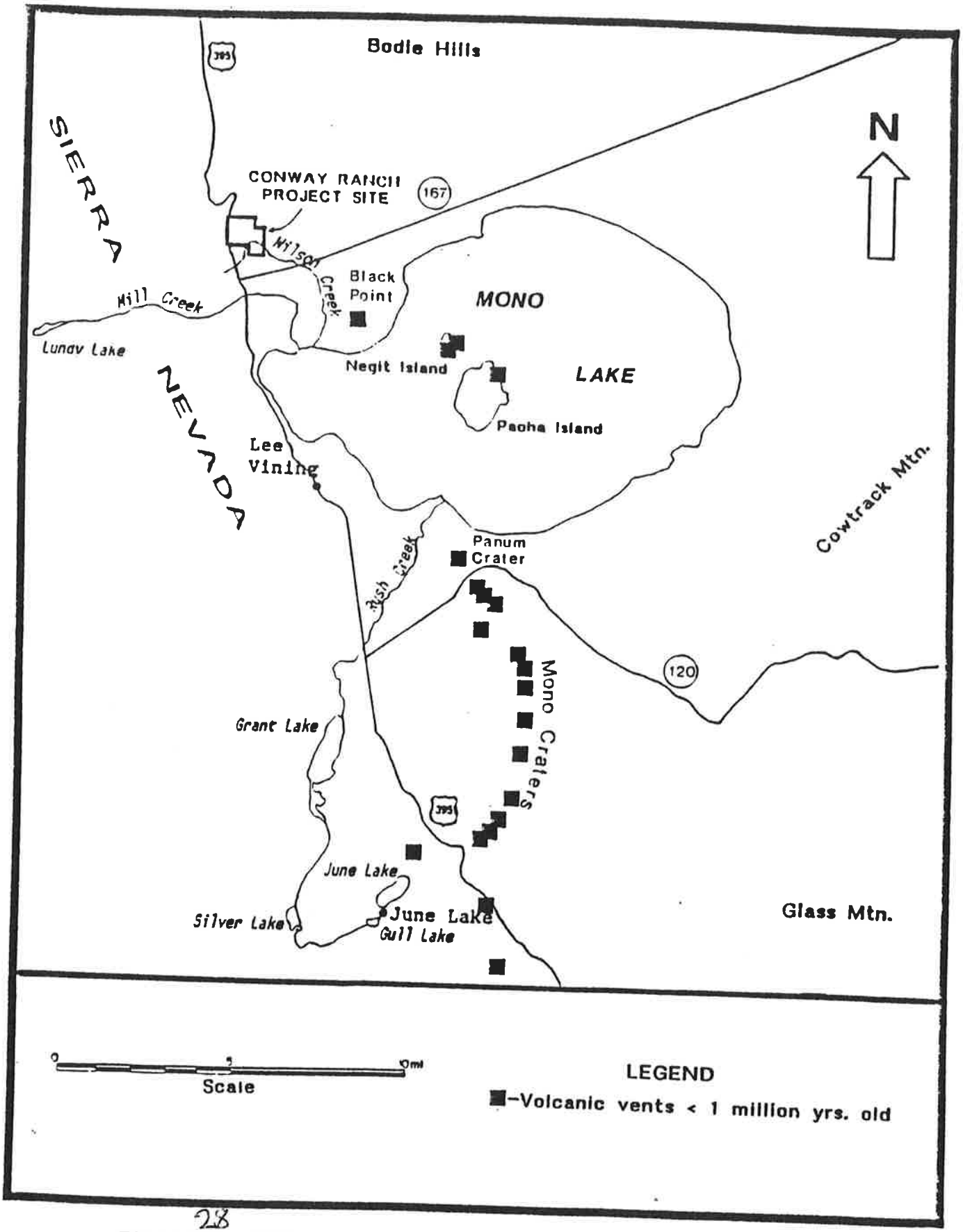


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FIGURE 12 -- VOLCANIC VENTS WHICH HAVE BEEN ACTIVE IN THE PAST ONE MILLION YEARS.
SOURCE: Beak Consultants Incorporated, 1990.

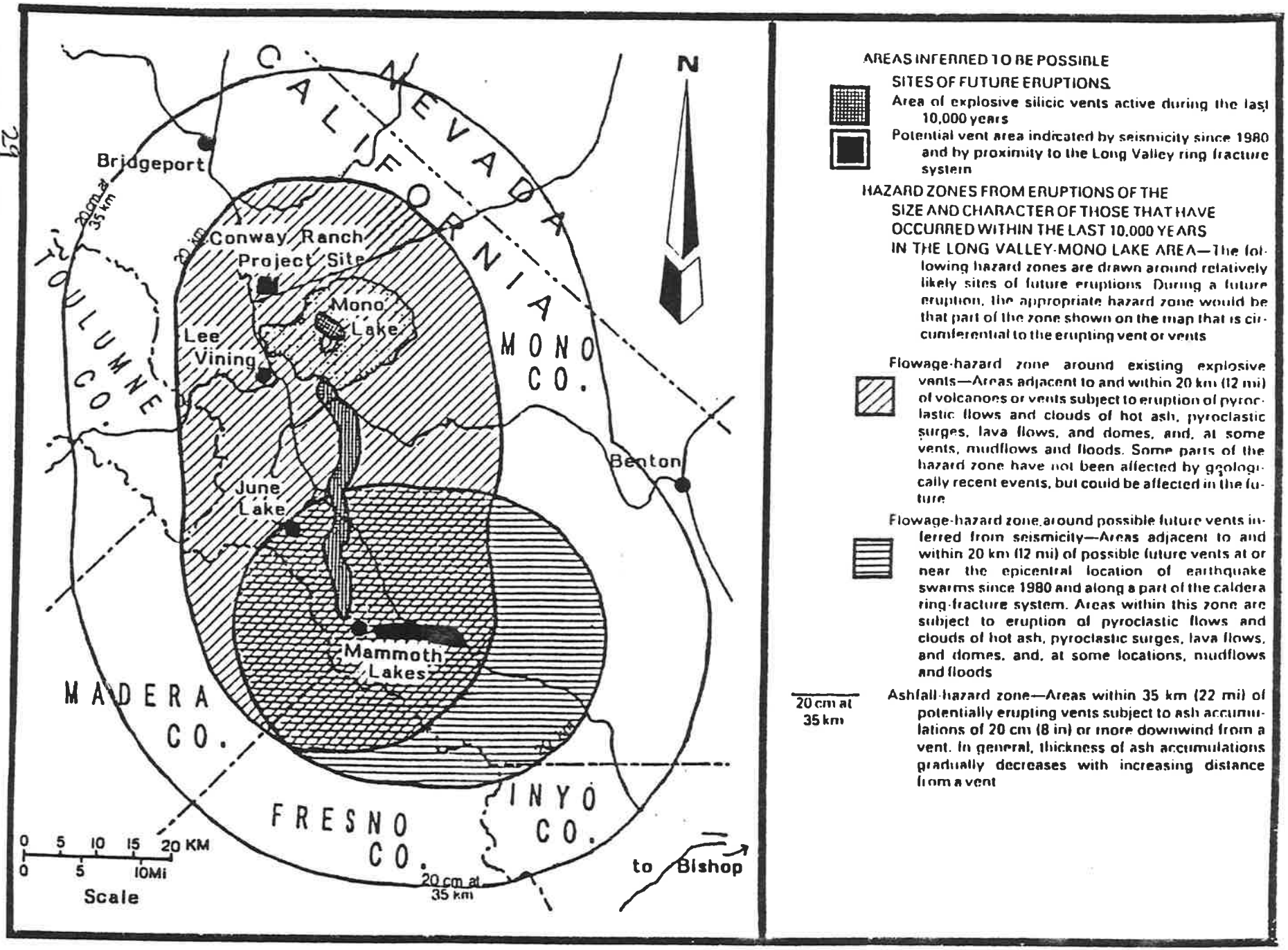


FIGURE 19.-- VOLCANIC HAZARDS.
SOURCE: Beak Consultants Incorporated, 1990.

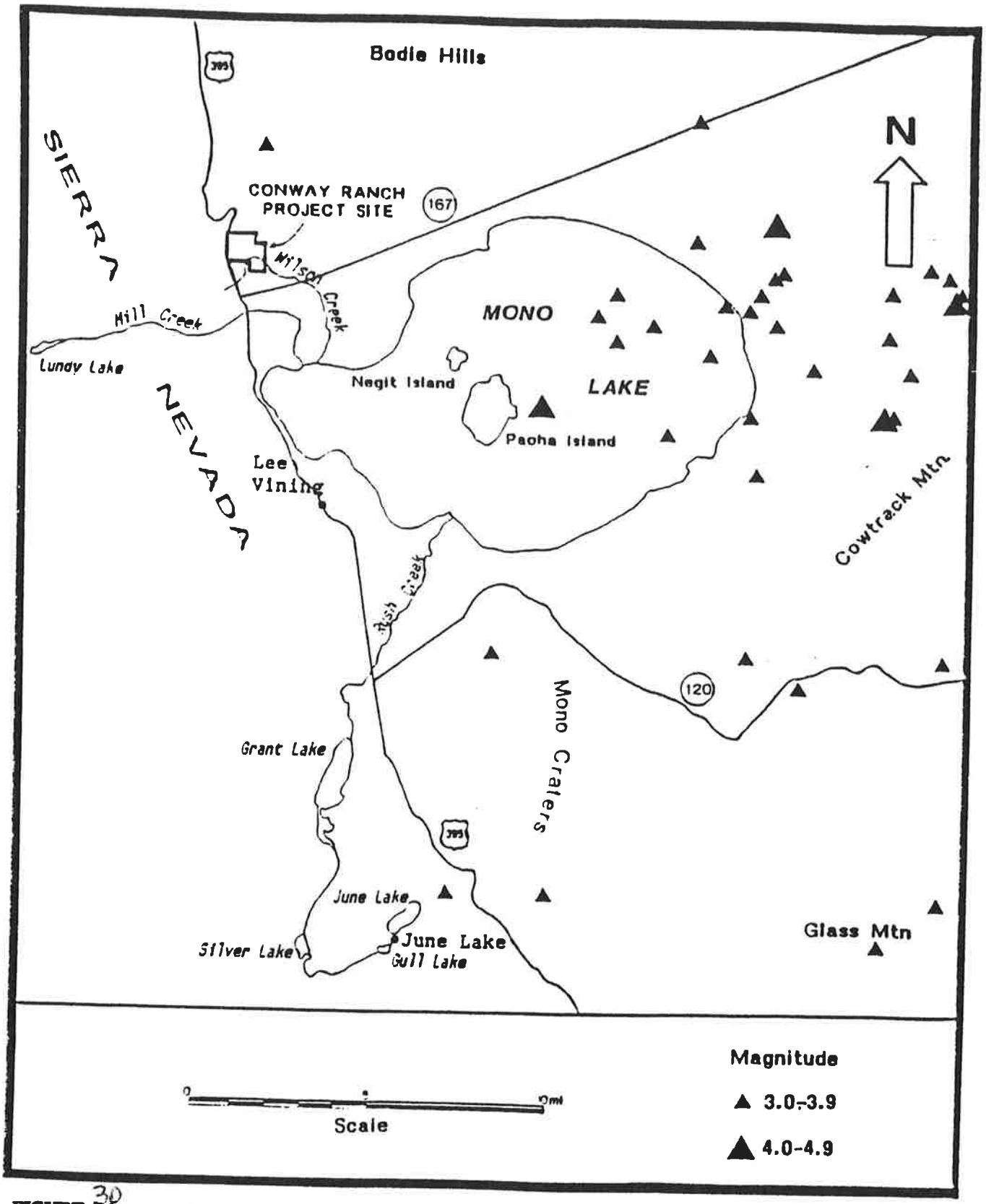


FIGURE 14 -- EARTHQUAKE EPICENTERS FOR THE PERIOD 1900 TO 1982.
SOURCE: Beak Consultants Incorporated, 1990.

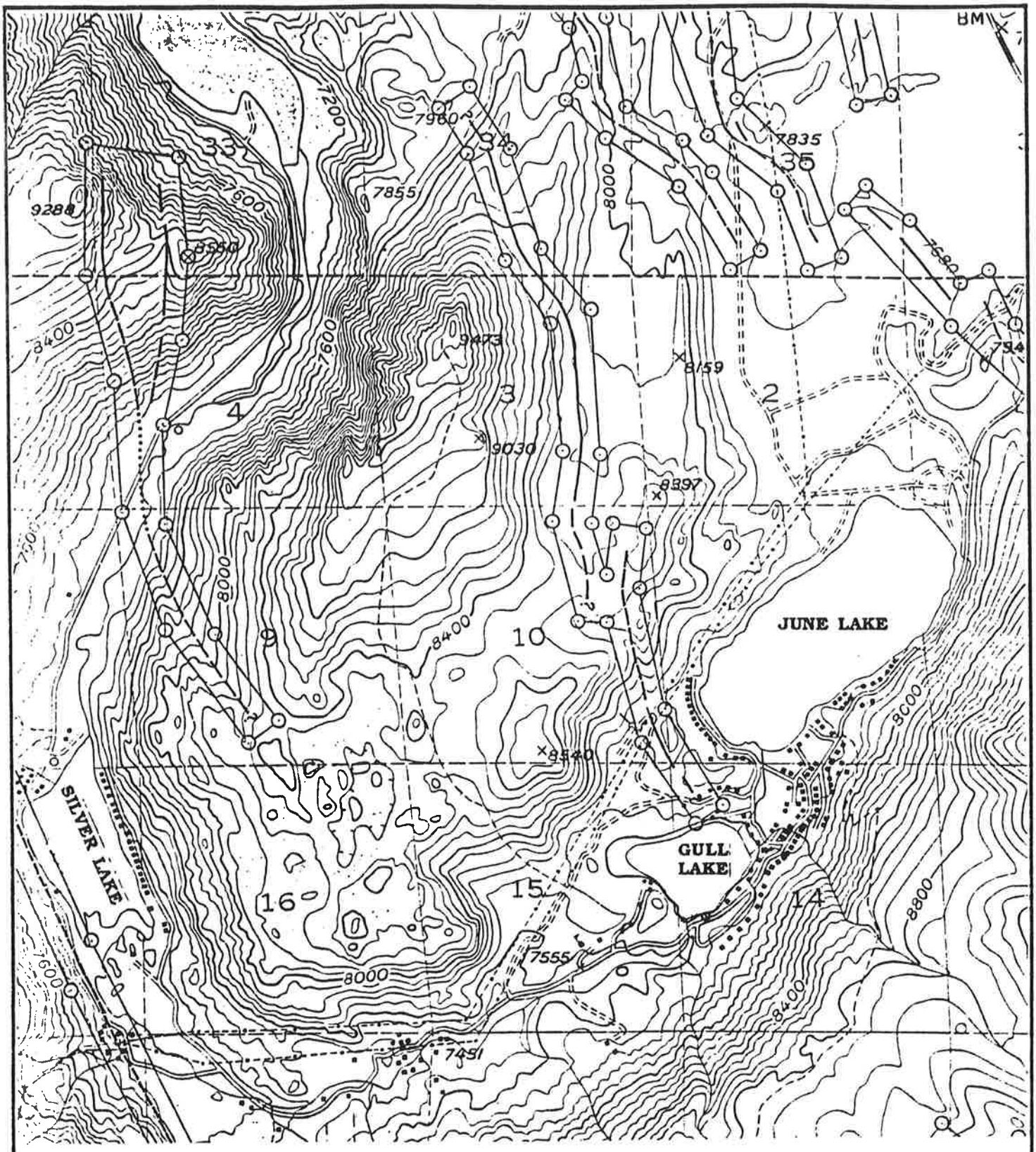


FIGURE 31
FAULT RUPTURE ZONES
Scale: .5" = 1,320'

SOURCE: California Division of Mines and Geology, 1989.

LEGEND

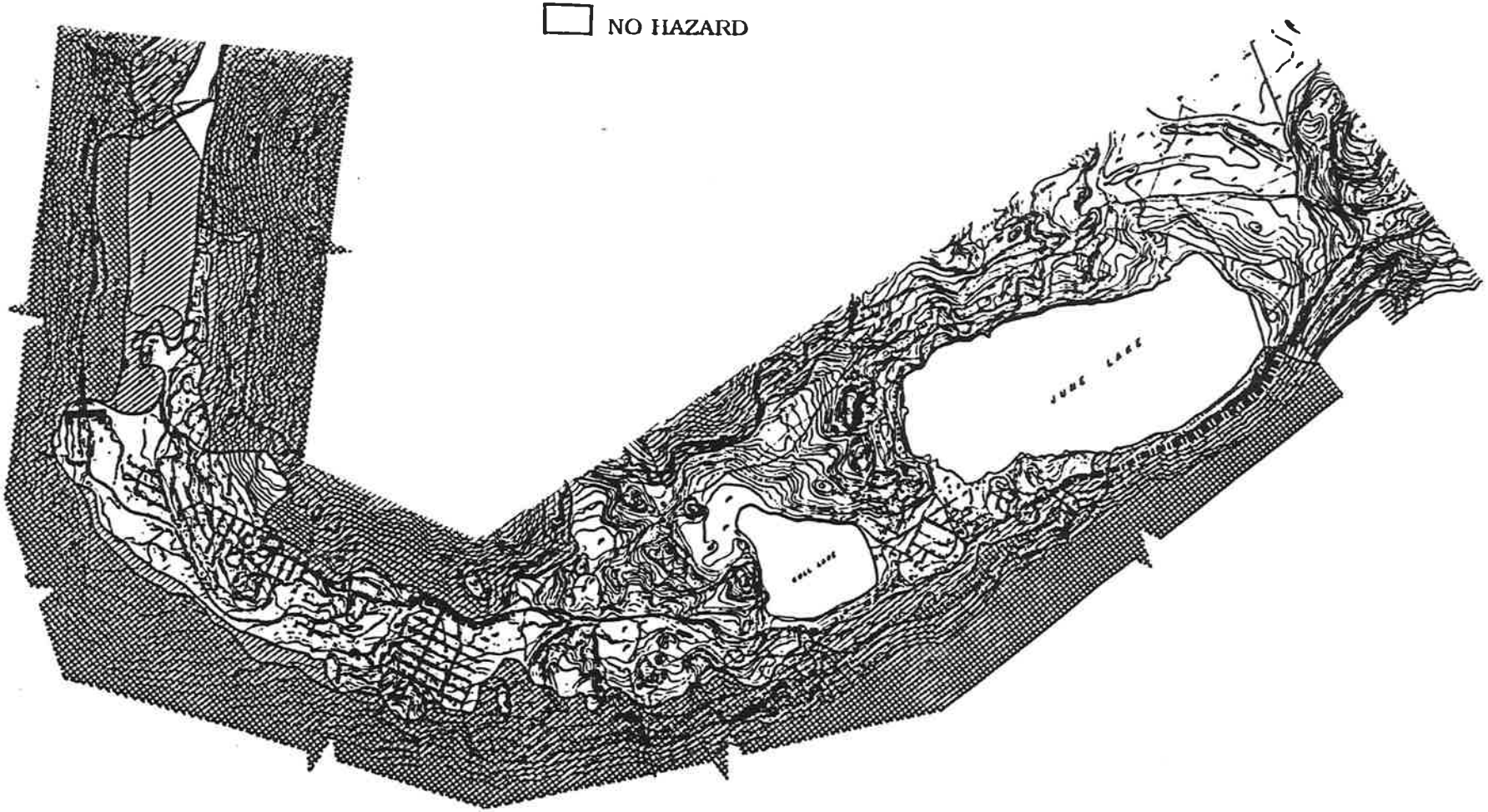
- ROAD CLOSURE
- POTENTIAL ROAD PROTECTION
- HIGH HAZARD
- POTENTIAL HAZARD
- NO HAZARD

north

FIGURE 16
AVALANCHE HAZARDS

0 1000

SOURCE: Sedway/Cooke, 1974.



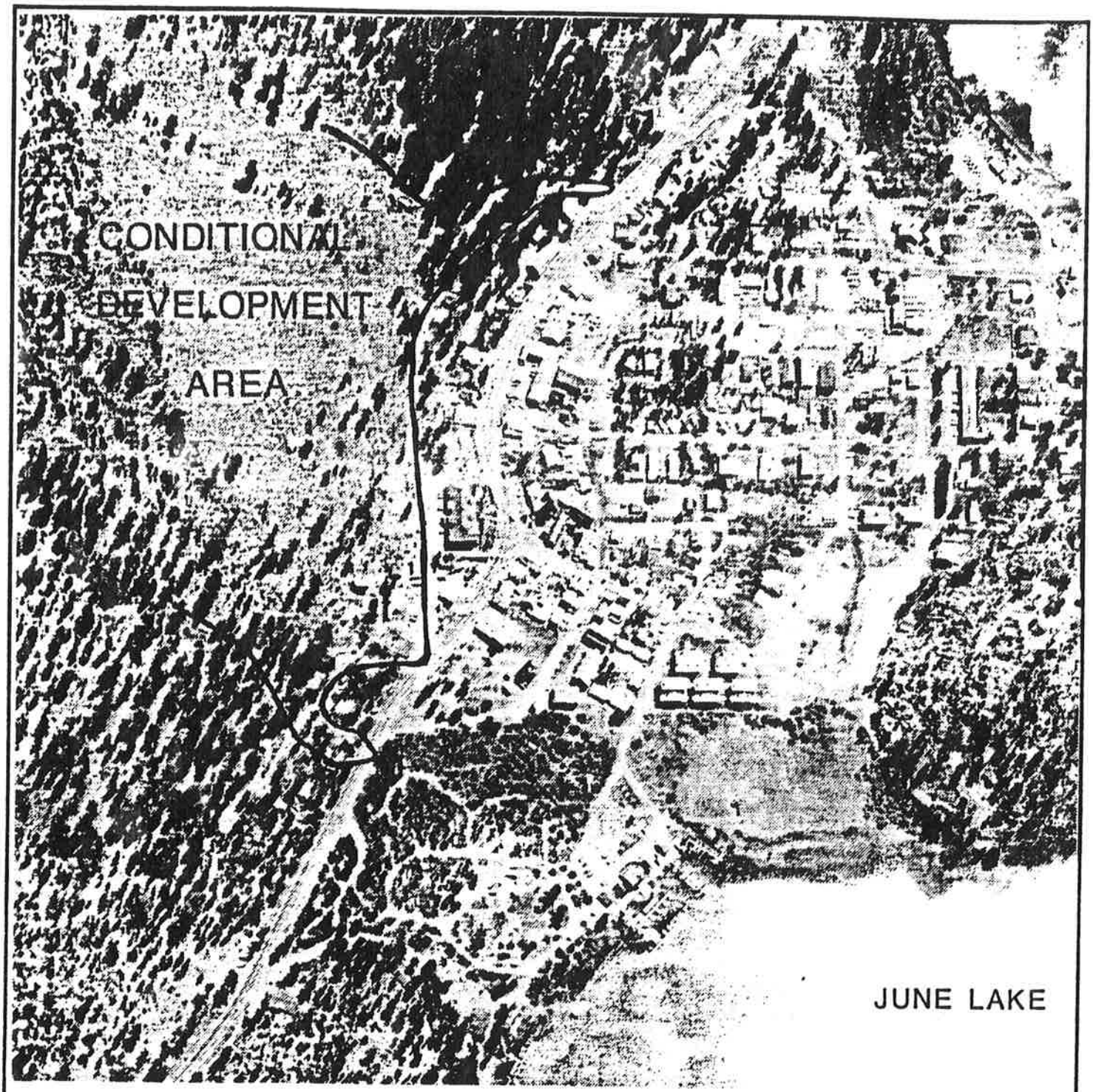


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FIGURE 17
CONDITIONAL DEVELOPMENT AREA, AVALANCHES

SOURCE: June Lake Avalanche Committee, 1988.

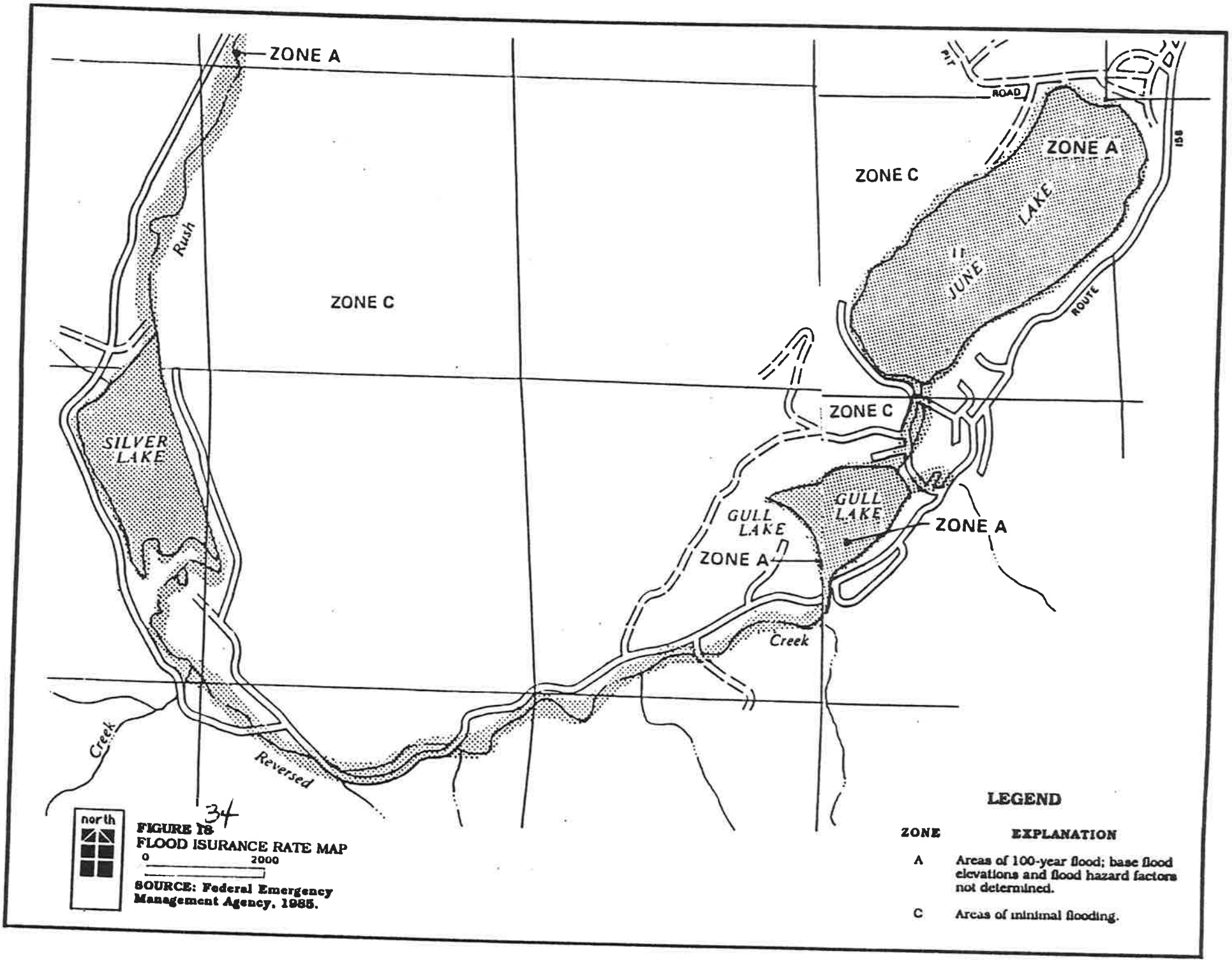

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FIGURE 18
FLOOD ISURANCE RATE MAP

SOURCE: Federal Emergency Management Agency, 1985.