5. Affected Environment

5.1 Introduction

This chapter is a description of the biological, physical, and socioeconomic characteristics, including human uses that could be affected by implementing the action alternatives for this RMP/EIS (see Chapter 3). Where possible, the information and direction for Reclamation resources has been further broken down into fine-scale assessments and information. Specific aspects of each resource discussed in this section were raised during the public and agency scoping process. The level of information presented in this chapter is commensurate with and sufficient to assess potential effects of the action alternatives in Chapter 6.

5.2 Resources

This section contains a description of the biological and physical resources of the New Melones Lake Area and generally follows the order of topics addressed in Chapter 3, as follows:

- Air quality;
- Noise;
- Climate;
- Geology;
- Topography;
- Hydrology/water quality;
- Visual Resources;
- Vegetation;
- Fish and wildlife;
- Special status species;
- General land management;
- Access and transportation;
- Public health and safety;
- Invasive species control;
- Fire management;
- Cultural resources;
- Indian Trust Assets;
- Socioeconomic and environmental justice;
- General recreation;
- Facilities, land use, and management areas;
- Aquatic recreation;
- Land-based recreation;
- Interpretive services and visitor information; and
- Utilities.

5.2.1 Air Quality

The New Melones Lake Area's location in Calaveras and Tuolumne Counties places it in the Mountain Counties Air Basin in the central Sierra Nevada foothills. Air quality problems in this air basin include periodic high levels of ozone and suspended particulate matter. Other air pollutants generally do not occur in concentrations high enough to constitute a problem.

Air quality management programs in California are the responsibility of local air pollution control districts (APCDs), the California Air Resources Board (CARB), and the US EPA. The local air pollution control districts for the New Melones Lake Area are the Calaveras County APCD and the Tuolumne County APCD.

Federal and state air quality management programs have evolved using a combination of two different approaches:

- The state implementation plan (SIP) process of setting ambient air quality standards for acceptable exposure to air pollutants, conducting monitoring programs to identify locations experiencing air quality problems, and then developing programs and regulations designed to reduce or eliminate those problems; and
- The hazardous air pollutant process of identifying specific chemical substances that are potentially hazardous to human health and then setting emission standards to regulate the amount of those substances that can be released by individual commercial or industrial facilities or by specific types of equipment.

Both the EPA and CARB have adopted ambient air quality standards for various pollutants. Federal ambient air quality standards have been adopted for ozone, suspended particulate matter, carbon monoxide, nitrogen dioxide, sulfur dioxide, and lead. State ambient air quality standards have been adopted for these same pollutants, plus sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. Federal and state ambient air quality standards for suspended particulate matter have been established for two different size ranges of suspended particles: inhalable particles (designated as particulate matter less than 10 microns in equivalent aerodynamic diameter [PM_{10}]), and fine particles (designated as particulate matter less than 2.5 microns in equivalent aerodynamic diameter [$PM_{2.5}$]).

Ambient air quality in Tuolumne County is monitored in Sonora, specifically ozone, PM_{10}, $PM_{2.5}$, and carbon monoxide; ambient air quality in Calaveras County is monitored in San Andreas, specifically ozone and carbon monoxide. There is no PM_{10} or $PM_{2.5}$ monitoring in Calaveras County.

High ozone levels in Calaveras and Tuolumne Counties are due almost entirely to pollutant transport from the Central Valley and the San Francisco Bay Area (CARB 2001a). Air quality management programs for Calaveras and Tuolumne Counties rely

primarily on emission control programs in upwind source areas to provide for eventual attainment of state and federal ozone air quality standards.

Ozone monitoring data from Sonora and San Andreas show that the state and federal ozone standards typically are exceeded several times each year, with considerable year-to-year variation (CARB 2007a). Ozone monitoring data from Sonora and San Andreas show no clear trend in either the frequency of violations or the maximum measured ozone levels. PM_{10} monitoring data from San Andreas in Calaveras County do not show any clear trends in annual average PM_{10} levels (CARB 2007a).

Most hazardous air pollutant regulations relate to specific industrial sources and operations, but California has identified naturally occurring asbestos as a toxic air contaminant. Naturally occurring asbestos is found in serpentine rock and in some types of ultramafic rocks (those most often found in fault zones). CARB has adopted regulations for limiting the amount of naturally occurring asbestos in aggregate material used for surfaces, including those for roads, road shoulders, parking areas, trails, and playgrounds (CARB 2000). CARB also has adopted separate regulations for construction, grading, quarrying, and surface mining that disturb areas of serpentine, ultramafic rocks, or other areas found to have naturally occurring asbestos (CARB 2001b). The local APCDs enforce these regulations.

Air pollutant emission sources associated with New Melones Lake Area include car and truck traffic, boat and personal watercraft engine emissions, and generators, camp stoves, and campfires at campground facilities. Localized air quality can be lowered at boat ramps where cars, boats, and personal watercraft may idle while launching. Seaplanes and wildfires and prescribed burns on lands surrounding the New Melones Lake Area are additional but infrequent sources of air pollutant emissions. Facility construction is another, temporary and localized, source of fugitive dust and vehicle emissions.

5.2.2 Noise

In general, background noise levels vary with wind conditions and relative location (on the lake, along the shoreline, or inland). Typical background noise levels are expected to vary from 35 A-weighted decibels (dBA) to 50 dBA, depending on wind conditions. Aircraft overflights represent an intermittent contributor to overall background noise levels. Noise levels are often somewhat higher near such sources as highway traffic, occupied campgrounds, and areas of the lake with boat and personal watercraft use.

Intermittent but intense noise sources may occur as a result of floatplane landings and takeoffs, model aircraft flying, amplified music on wakeboard boats and houseboats, and construction or maintenance at various facilities (Reclamation 2006a) or detonations of explosives at the nearby Carson Hill Mine and at the Blue Mountain Minerals Mine in River Canyon. Hunting represents a seasonal, localized, and intermittent source of noise in areas away from campgrounds and other heavily used visitor facilities. Unauthorized off-road vehicle use represents another intermittent noise source affecting some portions of the New Melones Lake Area.

The highest overall noise levels are expected to be in the vicinity of campgrounds, the marina, boat launching facilities, and occupied day use areas. In general, noise conditions in the New Melones Lake Area would not interfere with recreational activities and experiences. However, in a 1993 survey during the Independence Day holiday, some visitors complained about excessive nighttime noise in campgrounds and high noise levels from boats. Boats and personal watercraft with underwater engine exhaust and at full throttle generally produce noise levels of 75 to 85 dBA at a distance of 50 feet (15 meters) (Lanpheer 2000).

5.2.3 Climate

The foothills in which New Melones Lake is located are part of the Sierra bioregion, which includes the entire Sierra Nevada, extending approximately 380 miles (610 kilometers) along California's eastern side. Climate at the lake is Mediterranean, meaning that it has wet winters and dry summers. The location of the lake between the higher elevations of the Sierra and the low-lying floor of the Central Valley means that temperatures are moderate and between those found at these two extremes. Because of this transitional location, climatic features, such as temperature and precipitation, fluctuate widely throughout the year. This fluctuation in turn leads to profound yet predictable seasonal variations in the conditions of various resources, including water temperatures and levels, vegetative vigor, and wildlife residency.

Localized fluctuations in temperature and precipitation within the project area result from aspect and elevation. These fluctuations are apparent as differences in vegetation patterns, soil formation and stability, and moisture retention. Although these localized variations in resource conditions may affect planning on a project level, climatic resource conditions for the RMP/EIS are reported on a regional level.

Climate data shown in Table 5-1 reflect average high and low temperatures and average precipitation from 1992 to 2006. During this time, the maximum recorded temperature at New Melones Dam was 110 degrees Fahrenheit (43 degrees Celsius), while the lowest temperature was 24 degrees F (- 5 degrees Celsius). Extended periods of temperatures at or below freezing are uncommon. Mean annual rainfall at the dam during this period was about 33 inches (83 centimeters) (Western Regional Climate Center [WRCC] 2006).

Table 5-1: New Melones Dam, Period of Record Monthly Climate Summary

Period of Record: 3/1/1992 to 10/31/2006													
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Annual**
Average maximum temperature (F)	56.2	59.3	64.8	69.2	79.3	88.1	96.5	95.8	90.1	79.2	64.6	56.6	75.0
Average minimum temperature (F)	38.4	40.1	43.6	45.2	52.5	58.2	65.0	63.8	59.4	51.9	43.3	38.1	50.0
Average total precipitation (in.)	7.67	5.35	4.18	2.75	1.82	0.48	0.05	0.07	0.23	1.33	2.86	5.71	32.50

Source: WRCC 2006

More annual precipitation is expected in some of the higher watersheds that ultimately contribute to New Melones Lake. Most precipitation in the immediate vicinity of the lake falls as rain, with a very small amount falling as snow, and occurs primarily between November and April (WRCC 2006). Although the dry season at New Melones is long, hot, and dry, lake levels are maintained during this time by melting snowpack. Other climatic variables, such as global warming, drought, or long-term regional changes in precipitation, may affect resources over the next 15 to 20 years.

5.2.4 Geology

Overall Geology

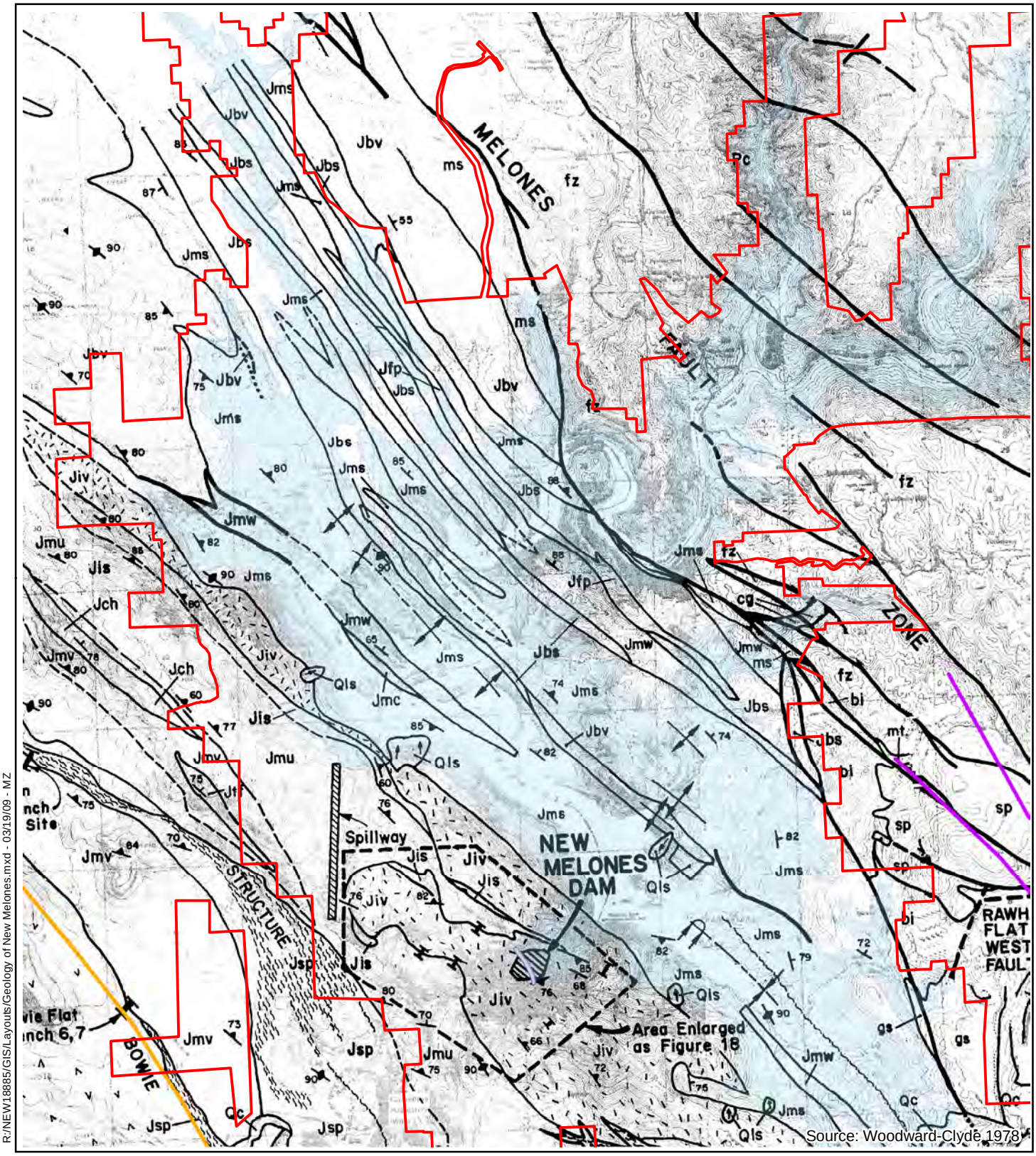
This section has been organized into the following subsections:

- **Geologic Formations—**Subterranean features that shape the topography of the lake and its surroundings;
- **Seismicity—**Faults found in the area;
- **Mineral Resources—**Minerals that have been mined commercially in the area or for which there may be specific management actions in the RMP/EIS;
- **Soils—**Soil types found in the area and the geologic features that produce them; and
- **Caves—**The numerous caves that are found in the limestone formations at the northern part of the lake.

Geologic Formations. The interpretation of the geology of the foothills of the Sierra Nevada is difficult because the understanding of the geology has undergone many changes and refinements. A narrative of the major geologic features has been included in this section to highlight the formations and stratigraphic units particularly influential to the New Melones Lake Area.

One of the noteworthy features of the study area that is apparent in Figure 5-1 is a general tendency of the mapped units and of lines representing structural features to have a northwest trend. In fact, it is clear that the main body of New Melones Lake is similarly oriented. This northwest trend is produced by the Foothills Metamorphic Belt (FMB), which extends about 150 miles (240 kilometers) from the Modoc Plateau in the north to about the latitude of Merced in the south. In the study area, the FMB is bounded on the east by the Calaveras Formation (also referred to as the Calaveras Complex) and on the west by sedimentary rocks of the Great Valley sequence. The two most prominent structural features within the FMB are the Melones Fault Zone and the Bear Mountain Fault Zone.

The Sierra Nevada is the result of relatively recent uplift of the range by faulting. The block containing the Sierra Nevada batholith was pushed up to the east and tilted down to the west. As this happened, the rocks into which the batholith had intruded eroded away,



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Geology of New Melones

Legend

- Project Boundary
- New Melones Lake

Late Quaternary Fault Segments (Jennings 1994)

- Bear Mountain
- Melones

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Miles

New Melones Lake Area, California
Central California Area Office

Figure 5-1

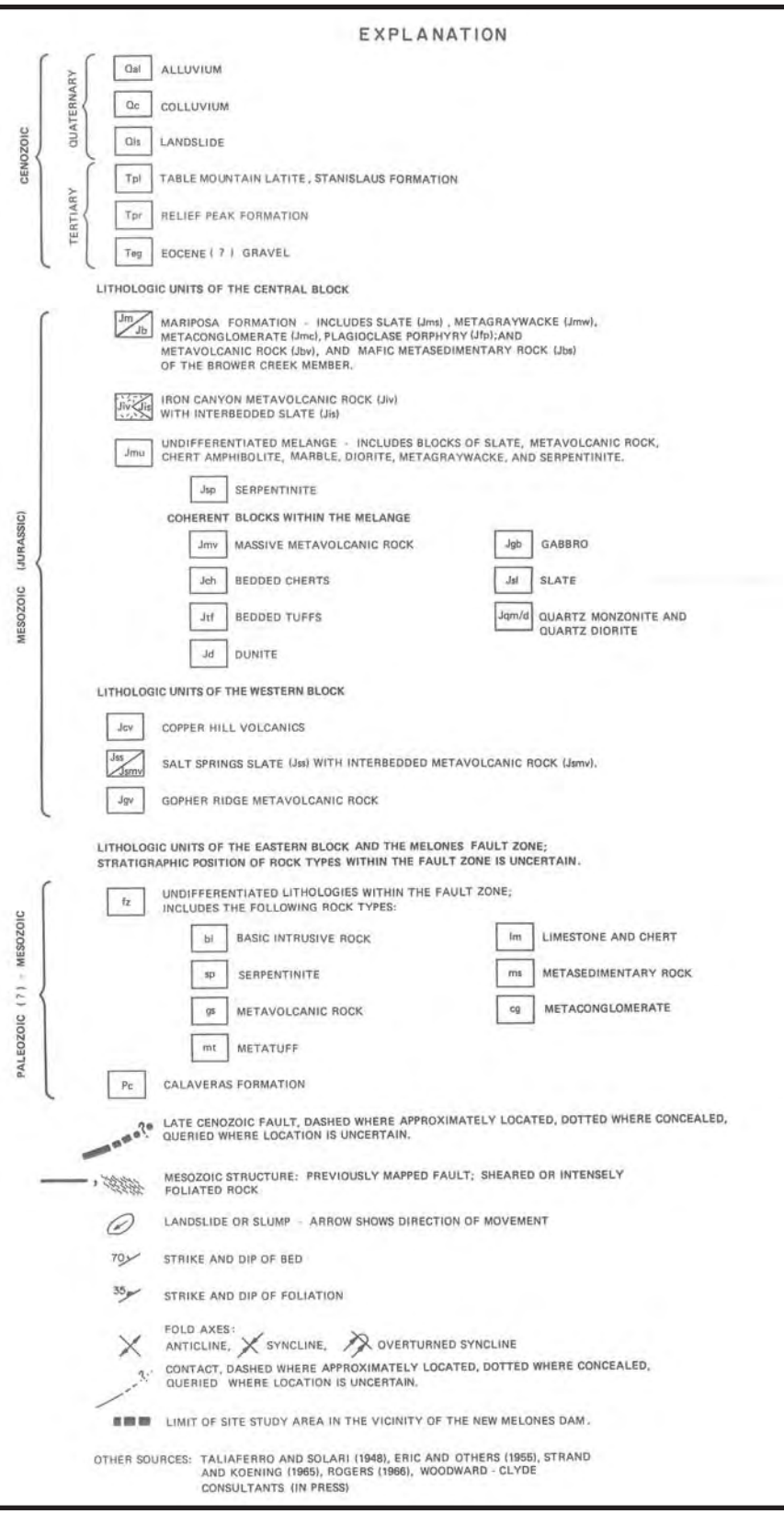

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Figure 5-1 Legend

New Melones Lake Area, California
Central California Area Office

exposing its younger and more resistant granitic rocks. However, small remnants of the original continental rocks were preserved, including bodies of limestone that belong to the Calaveras Formation.

The uplift of the Sierra Nevada was preceded and accompanied by volcanic activity that resulted in significant deposits of volcanic material, some of which have been given formation names, the most prominent of which within the study area is the Table Mountain latite.

Unique Geologic Features. Table Mountain is the cast of an ancient river valley. During the early to middle Miocene Period, large volumes of andesitic lava erupted from volcanoes east of the study area in what is now the Carson Pass area. Large quantities of andesitic mud and debris washed down the stream channels. Subsequent eruptions of latite lava followed and filled these ancient stream channels, forcing the rivers to find other routes. The river channels buried under these volcanic deposits contained placer gold deposits. The lava buried and preserved both the placer gold deposits and the Mehrten Formation deposits. Eventually, the surrounding land surface eroded, leaving behind flat-topped ribbons of the resistant latite lava.

Seismicity. The two major faults affecting the dam foundation are the Powerhouse Fault and the IF-83 Fault. The Powerhouse Fault passes through the Powerhouse foundation, across the canyon floor downstream of the toe of the dam, and curves toward the east, crossing the left abutment of the dam at an elevation of about 940 feet (290 meters). The IF-83 Fault strikes north 75 degrees west and dips 65 degrees south. It passes through the foundation of the sloping intake structure, under the extreme upstream toe of the dam, and continues up the left abutment, where it intersects the Powerhouse Fault. Two smaller faults occur within the foundation, one located high on the right abutment and the other on the lower left abutment (Reclamation 2006b).

Faults found in the vicinity of the New Melones Lake Area are not considered active, and the lake area's situation atop shallow bedrock would minimize shaking in the event of an earthquake. Reclamation would construct any new facilities in compliance with the California Building Code, which requires measures to minimize building failure in the event of an earthquake. Reclamation must also comply with the Alquist-Priolo Earthquake Zone Act, although this act would not restrict building because there are no Alquist-Priolo faults in the project area.

Mineral Resources. The mineral resources described below are found within the project area.

Gold. Gold occurs in lode deposits and placer deposits within the study area, which overlies the Carson Hill and Jamestown Gold Districts. The Carson Hill District (also known as the Melones District) includes the portion of the Mother Lode Belt, which extends from Carson Flat to the town of Melones on the Stanislaus River. (The town was abandoned when New Melones Lake was filled.) The Jamestown District extends south to the town of Stent. Milling ore of the Carson Hill District was usually low in grade, but the ore bodies were extensive (Oakland Museum of California 1998a, 1998b).

The Carson Hill (Melones) Mine is the largest recently active lode mining operation adjacent to New Melones Lake Area. It is between State Route (SR) 49 Stevenot Stanislaus River Bridge and Coyote Creek, just outside the study area boundary. The Jamestown Mine is on the southeast side of Table Mountain, outside the study area.

The town of Melones was historically the site of a placer gold dredging operation, and there are several former hydraulic mining locations within the study area. More important are the placer deposits contained in the ancient stream channels buried beneath Miocene Mehrten Formation and Table Mountain latite flows.

Chromite. Chromite deposits with moderate potential are present in the ultramafic rocks associated with the Bear Mountain Fault Zone. Little or no exploration has been conducted since the 1940s.

Limestone and dolomite. High-calcium limestone suitable for cement production is present in the Paleozoic limestone deposits of the Calaveras Complex.

Talc. Talc is present in localized hydrothermally altered schist deposits within the Melones Fault Zone. There are no active talc mining operations in the vicinity of the study area.

Asbestos. Asbestos minerals, such as chrysotile, are present in the serpentine deposits associated with the New Melones and Bear Mountain Fault Zones. The Jefferson Lake Asbestos Company operated the largest open pit asbestos mine in the United States at a site just south of the New Melones Dam, along the upper inlet of Lake Tulloch. The mine was closed in 1987. Calaveras Asbestos, Ltd. has operated the former pit as a landfill for disposing of asbestos-containing material and used tires.

Axonite. Axonite is a rare mineral known from only a few locations worldwide. Although not particularly valuable in and of itself, it is sought after by rock collectors due to its scarcity. Axonite has been identified at a single location on Reclamation lands, but collection of this mineral is not permitted.

Soils. Soils result from weathering rocks. They can be formed in place, or the parent material may be transported during a part of its history, as occurs with alluvial soils, which are deposited by flowing water. Soils reflect not only the geologic and mineral character of the parent rock material, but to an even greater extent, they reflect the climate conditions that the material is exposed to and the slopes that they form on. The study area is generally steep, with narrow V-shaped valleys and steep stream channels. There are few significant areas in which alluvium accumulates. The soils tend to be shallow and rocky. Soils on north-facing slopes are generally deeper than soils developed on south-facing slopes.

As part of an effort to classify the ecological regions of the United States into successively smaller units, the US Forest Service (USFS) has produced a map of the ecological subregions of California. Among other elements, the map identifies the broad categories of soils within the subregions (USFS 1997). The study area is in the Lower

Sierra Nevada Foothills Metamorphic Belt Ecological Subregion, where the soils are well drained. Bicarbonate weathering and leaching and clay accumulating in subsoils are the main processes driving soil formation. Soil temperature regimes are mostly thermic, and soil moisture regimes are xeric (requiring little moisture).

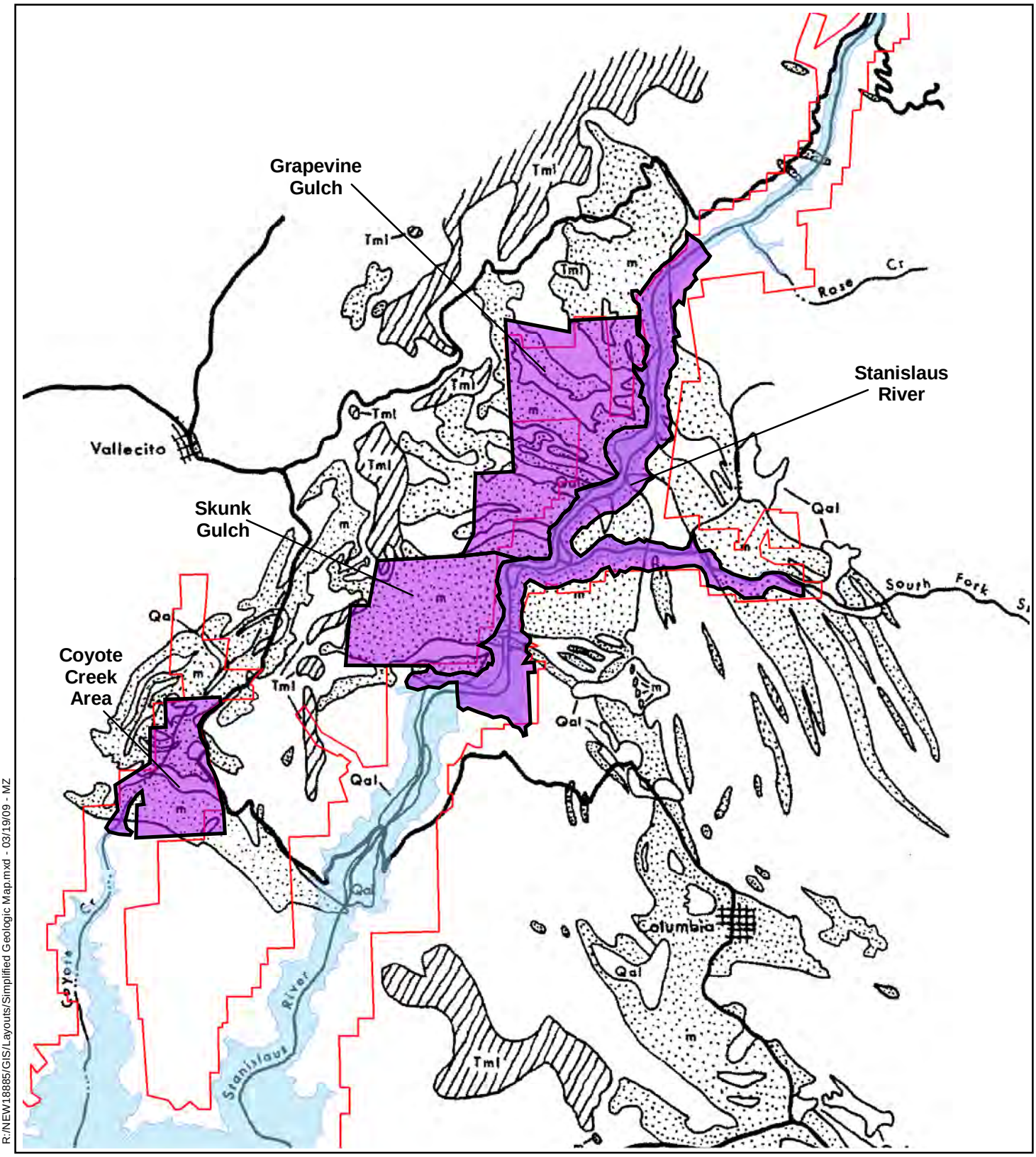
Serpentine soils are derived from serpentine, a type of rock with high magnesium to calcium ratios that was pushed up onto the continent during the subduction of the oceanic crust from the west. Serpentine rock weathers to soils which are often chemically different than the surrounding soils, with high amounts of magnesium, nickel, cobalt, chromium, and iron, while being poor in other plant nutrients (e.g., nitrogen, phosphorus). Therefore, the plants found on serpentine soils vary from those found on the surrounding soils. While serpentine soils occupy only 1 percent of the land area in California, 10 percent of native plant species are adapted to these soils. In California, these soils largely occur in the foothills of the Sierra Nevada and the Coast Ranges from San Luis Obispo County north to the Oregon border. These soils can also include naturally occurring asbestos derived from the serpentine source rock. The asbestos can be a hazard to public health and is considered in fire management plans.

Soils are most vulnerable where they have been denuded. In the New Melones Lake Area, this is most apparent where there has been a very hot wildfire or a landslide or below the top of the "bathtub ring" that is found beneath the high water mark of New Melones Lake. Soils in the bathtub ring are vulnerable to runoff from precipitation and also erode readily as a result of boat wakes or where vehicles have been driven across them.

Soil management measures are most apparent in the Shell Road and Peoria Wildlife Management Areas. Reclamation attempts to control illegal grazing and inappropriate vehicle use by fencing sensitive areas, installing educational or warning signs, closing access roads, maintaining roads and trails, and creating stormwater pollution prevention plans for areas where construction or other use may occur. Reclamation also limits the construction season to minimize soil disturbance, initiates park ranger patrols, and creates no-wake zones to minimize shoreline erosion.

Caves. This section addresses cave conditions in the Calaveras Terrain bordering the Stanislaus River, the South Fork Stanislaus River, and the headwaters of Coyote Creek. The cave area is north of the Melones Fault Zone, and most of it is north of the Parrotts Ferry Bridge (Figure 5-2). Limestone deposits within the Calaveras Formation consist of isolated blocks of recrystallized limestone and dolomite, which have been identified in some reports as marble. About 11,000 acres (4,450 hectares), or roughly half of the known marble and limestone within the Calaveras Formation, is found in the vicinity of the New Melones Lake Area, although most of these deposits are outside the management area.

The limestone and dolomite within the Calaveras Formation, known as the Calaveras Karst, is one of the most important karst areas in the state. Over 100 caves have been identified in the limestone of the Calaveras Formation. Before New Melones Lake was filled, the New Melones Reservoir Project (BLM 1978) studied cave resources, dividing



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Simplified Geologic Map of Columbia Area

Legend

Qal Quaternary Alluvium
Tml Table Mountain Latite
M Limestone/Dolomite/Marble

Project Boundary

Cave Inventory Areas (Mc Eachern & Grady 1978)

0 1
Miles

New Melones Lake Area, California
Central California Area Office

Figure 5-2

the study area into four subareas: the Stanislaus River Canyon, Coyote Creek, Skunk Gulch, and Grapevine Gulch. These areas overlap the New Melones Lake Area, as shown in Figure 5-2.

The 1978 study identified 87 caves in the inventory area. Thirty of the forty-four caves identified in the Stanislaus River Canyon are below the current spillway elevation of 1,088 feet (330 meters) above mean sea level and therefore are now inundated or subject to inundation by the lake. Nineteen caves were identified in the Coyote Creek Canyon. All but one of these (Lower Natural Bridges Cave) are above the current spillway elevation. Upper and Lower Natural Bridges caves are popular destinations for day hikers and have been since the Gold Rush. Coyote Creek flows through both caves. An early description of the Natural Bridges is included in a traveler's guide written by James Hutchings (Hutchings 1862). Moaning Caves, a large commercial cave, is in the Coyote Creek watershed upstream of the study area. Fifteen caves were identified in the Skunk Gulch Recreation Area (now part of the Parrotts Ferry Management Area), none of which are below the spillway elevation. Northeast of Skunk Gulch, the Grapevine Gulch Recreation Area (now part of the Stanislaus River Canyon Management Area) contains nine known caves, all above spillway elevation.

Table 5-2 gives a summary of the study areas and the numbers of caves in each. Appendix F lists the caves identified in the 1978 study and summarizes information on each cave. The specific locations of the caves are not provided in the report in order to protect fragile resources. The study ranked each cave based on priority for implementing mitigation recommendations for various resource values. The ranking criteria included geological, paleontological, archaeological, biological, aesthetic, and recreational significance. Also included was a taphonomic rating, which is concerned with the processes that affect animal and plant remains as they become fossilized. Caves 9, 16, 25, 43, 51, and 54 received the highest geological resource rankings. Of these, caves 25 and 54 are below the 1,088-foot (330-meter) elevation.

In December 1994, the Mother Lode Grotto of the National Speleological Society nominated five caves in the vicinity of New Melones Lake as significant and eligible for protection under the Federal Cave Resources Protection Act of 1988. These included Caves 25, 54, 77, Upper and Lower Natural Bridges (Caves 52 and 85, respectively), and Dragon's Breath caves. Lower Natural Bridges Cave may be inundated at high lake elevations.

Table 5-2: Summary of Pertinent Cave Study Area Information

Study Area	Elevation Range of Caves in Study Area (feet above sea level)	Number of Caves	Caves above High Water (1,088 feet)	Significant Caves*
Stanislaus River Canyon	910-1,550	44	13	3
Coyote Creek	1,060-1,980	20	19	2
Skunk Gulch	1,525-1,800	14	14	0
Grapevine Gulch	1,200-1,980	8	8	0

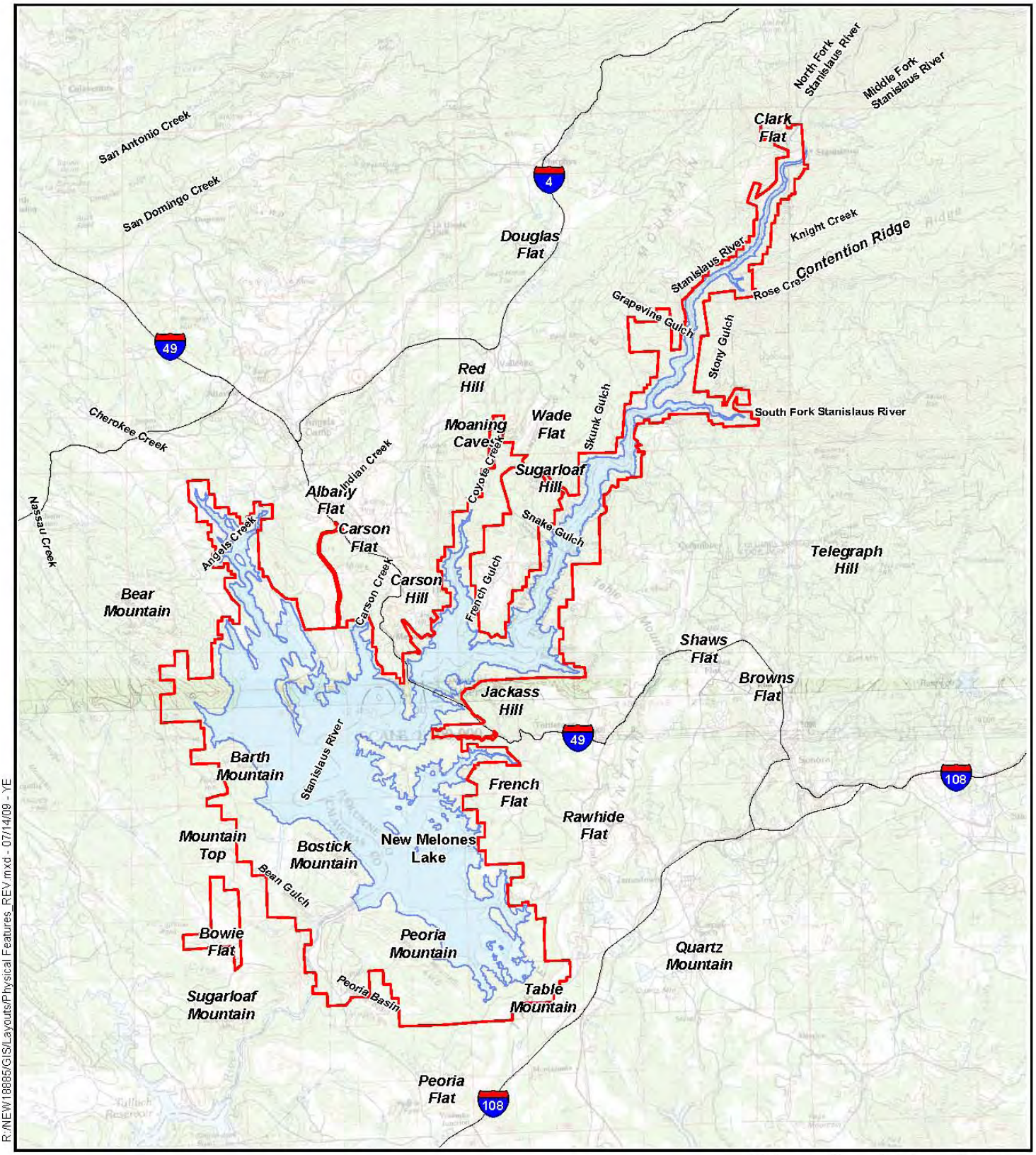
Notes: *Caves that have been nominated as "significant" and therefore eligible for protection under the Federal Cave Resources Protection Act of 1988.
Source: BLM 1978

5.2.5 Topography

Topographical features of the New Melones Lake Area include steep, rolling hills, incised river canyons, and distinct cliff and plateau features formed by unique geological processes. This variety of features contributes to a dramatic visual setting and provides for many recreational opportunities and habitat types. The lake itself is situated primarily along the historic canyon of the Stanislaus River, which was first flooded on completion and closure of Melones Dam and later by the much larger New Melones Dam. The orientation of the main stem of the Stanislaus River follows a general heading from northeast to southwest, with the canyons of several tributaries joining at different angles. The main body of the lake, stretching between Table Mountain in the south and Angels Arm in the north, follows a northwest-to-southeast bearing. The various ridges appear as islands as the lake is drawn down over the dry season or during a period of below-average precipitation.

Figure 5-3 shows the physical details of the planning area as well as the major topographical features. The main stem of the Stanislaus River between the Clark Flat and Mark Twain planning units is dominated by very steep canyon walls that make much of the lakeshore inaccessible except by boat. The original streambed of the Stanislaus River is evident upstream of Clark Flat, which is above the flooded zone. The northeast side of the main body of the lake, which includes the Tuttletown, Carson, and Glory Hole planning units as well as lake headquarters, has more gently rolling and accessible terrain. The south end of the main body of the lake is dominated by Table Mountain, which is within the Table Mountain planning unit and exhibits dramatic topographical relief provided by fluted cliffs and a flat top. Sheer cliff faces of up to 300 vertical feet (90 meters) are found on the north side of Table Mountain, which is composed of more erosion-resistant bedrock than the surrounding area and thus was exposed as fluvial processes eroded softer materials around it. The mesa top slopes gently downward to the west and ranges between 1,500 and 1,800 feet (450 to 550 meters). Both the cliffs and the flat top provide unique opportunities for recreation, as the cliffs offer climbing and bird-watching opportunities and the mesa top offers scenic views.

The topography of the top of Table Mountain, being flat and exposed to few eroding features, such as rockfalls or streams, creates conditions conducive to vernal pools. Such pools form where rainwater is trapped in impervious depressions and dissipates solely by



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Physical Features

New Melones Lake Area, California
Central California Area Office

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Miles

Figure 5-3

evaporation, allowing concentric rings of vegetation to become established. Plant and animal species that colonize vernal pools are often rare and endemic only to vernal pools.

In the Peoria Wildlife Area planning unit, 1,832-foot (560-meter) Peoria Mountain dominates the southwest end of the main body of the lake and, compared to terrain in the north fork arm, is marked by rolling topography and gentler ridgelines. This terrain and a north-facing aspect have allowed moderately deep to deep soils to develop, which in turn support a healthy and productive oak savannah habitat type. On the south side of the dam, Peoria Mountain's peaks plunge steeply into Iron Canyon, which contains New Melones Dam. On the north side of the dam, Bostick Mountain rises steeply to an elevation of 1,814 feet (550 meters), then gradually slopes down to Bowman Gulch, which spills into Bean Gulch before it enters Lake Tulloch. North of the spillway, Barth Mountain rises to an elevation of 1,916 feet (580 meters). Gently sloping terrain is found at the eastern foot of Bear and Barth Mountains in the Texas Charley planning unit and on the other side of the Angel Creek Arm in the vicinity of Glory Hole. Peoria, Bostick, Barth, and Bear Mountains form a major ridgeline on the west side of the main body of the lake. This ridgeline drops at a fairly steep angle into the lake, making development on this side of the lake difficult due to lack of access and staging areas.

5.2.6 Hydrology/Water Quality

Overall Hydrology

The hydrology section has been organized into two subsections. The first focuses on water resources in the New Melones Lake Area and gives a brief introduction to dam operations, including storage and release requirements; the second subsection focuses on water quality issues and current conditions in New Melones Lake.

Water Resources. Although dam operations are not managed by New Melones resource staff and will not be addressed in the RMP/EIS, this introduction is given to provide an overview of issues that relate to water levels, which in turn influence management of resources that will be addressed in the RMP/EIS.

One of the primary purposes of New Melones Lake is water storage for flood control. The primary operational criteria for New Melones Lake are provided in the California State Water Resources Control Board (SWRCB) Water Right Decision 1422, which was issued in 1973. This decision allowed Reclamation to appropriate water from the Stanislaus River into New Melones Lake for irrigation and municipal and industrial uses but required that lake operations include releases of water for existing water rights, fish and wildlife enhancement, and the maintenance of water quality conditions (primarily temperature and dissolved oxygen) on the Stanislaus and Lower San Joaquin Rivers (Reclamation 2005).

The maximum storage volume of the lake is 2,420,000 acre-feet (2.9 million megaliters), and the maximum surface area is 12,500 acres (5,000 hectares). The lake has a shoreline of approximately 100 miles (160 kilometers) when filled to capacity. Between 2000 and 2006, storage in New Melones Lake ranged from approximately 1.1 to 2.1 million acre-

feet (1.3 to 2.6 million megaliters), with the highest levels typically in early summer and the lowest levels at the beginning of the water year in October. According to Reclamation's rating curve for the lake, this translates into a maximum water level elevation of 1,061 feet (320 meters) above mean sea level. Water levels vary as a result of drought, varying amounts of precipitation, and discharge requirements for flood control, power generation, irrigation, municipal requirements, and maintenance of aquatic habitat. Surface levels may also vary as a result of managed releases from storage facilities on streams above New Melones Lake. At least 10 reservoirs, with storage capacities ranging from 250 acre-feet (310 megaliters) to 189,000 acre-feet (233,000 megaliters), store water above New Melones. Those facilities and their storage capacities are shown in Table 5-3. The New Melones Lake Area's position in the regional watershed is shown on Figure 5-4, and the watershed draining directly to the New Melones Lake Area is shown on Figure 5-5.

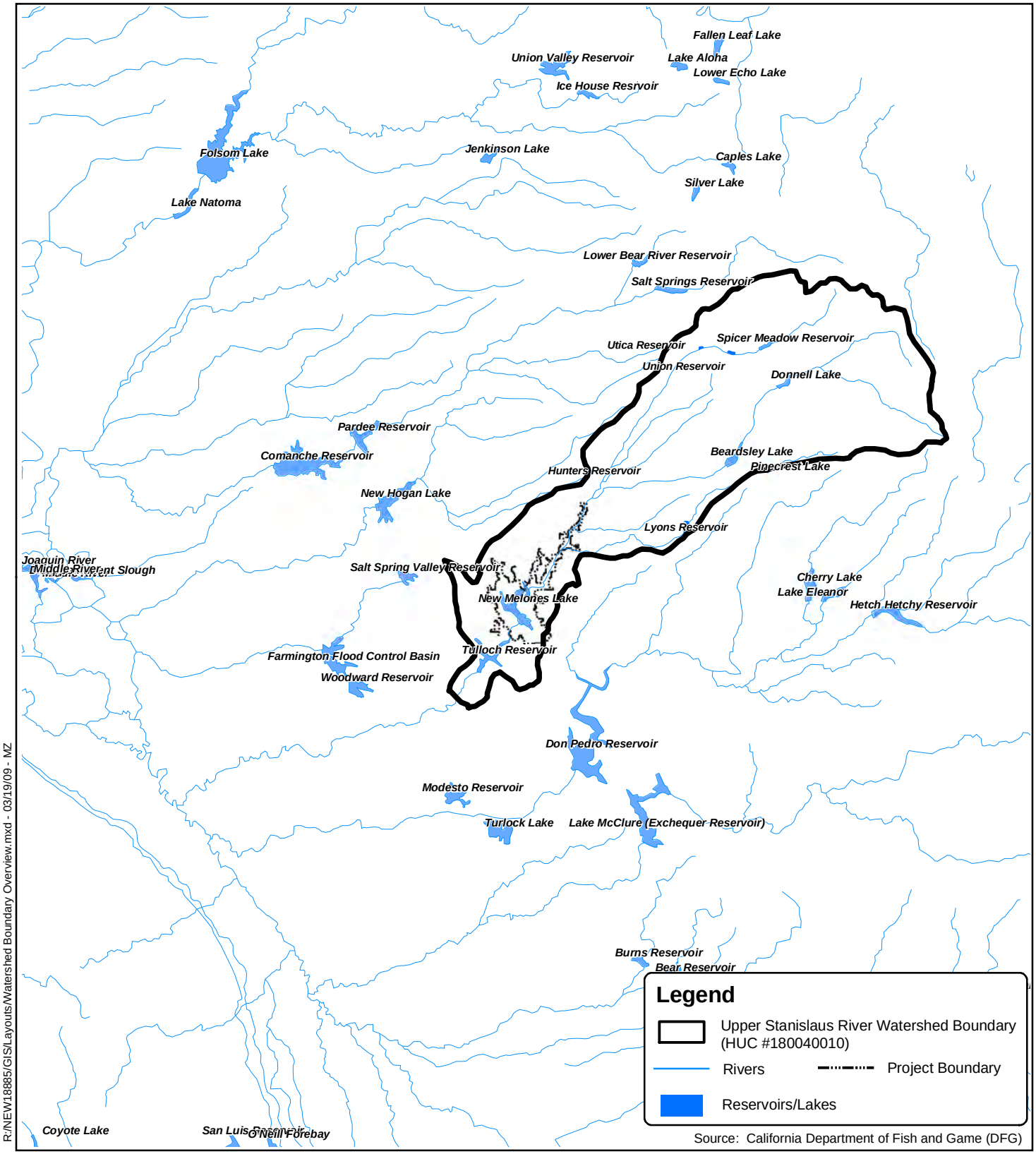
Daily outflows from the lake vary widely and are generally lowest during the rainy season (approximately October through April). Between 2000 and 2006, outflows ranged from 0 to 3,000 cubic feet per second (85 cubic meters per second), with the highest outflows typically in the summer (US Geological Survey [USGS] 2007).

Table 5-3: Existing Storage Above New Melones Lake

Fork of the Stanislaus River	Reservoir	Storage Capacity (acre-feet)
North		
	Lake Alpine	4,120
	Union Reservoir	3,130
	Utica Reservoir	2,330
	Spicer Meadows Reservoir	189,000
	Hunters Reservoir	250
Middle		
	Relief Reservoir	15,500
	Donnel Lake	64,300
	Beardsley Lake	97,800
South		
	Pinecrest Reservoir	18,310
	Lyons Reservoir	6,220

Source: Moore 1994

Streams. All three forks of the Stanislaus River originate in the Sierra Nevada. There are also a number of small creeks, both ephemeral (flowing only a portion of the year) and perennial (flowing year round), that discharge into New Melones Lake, including Coyote Creek, Carson Creek, and Angels Creek; however, the Stanislaus River is the main source of water for New Melones Lake. The main factor that determines whether streams within the planning area maintain perennial or ephemeral characteristics is their place of origin. In general, streams originating higher in the Sierra Nevada and fed by melting snowpack are more likely to flow year round than streams fed primarily by rainfall. The



Watershed Boundary Overview

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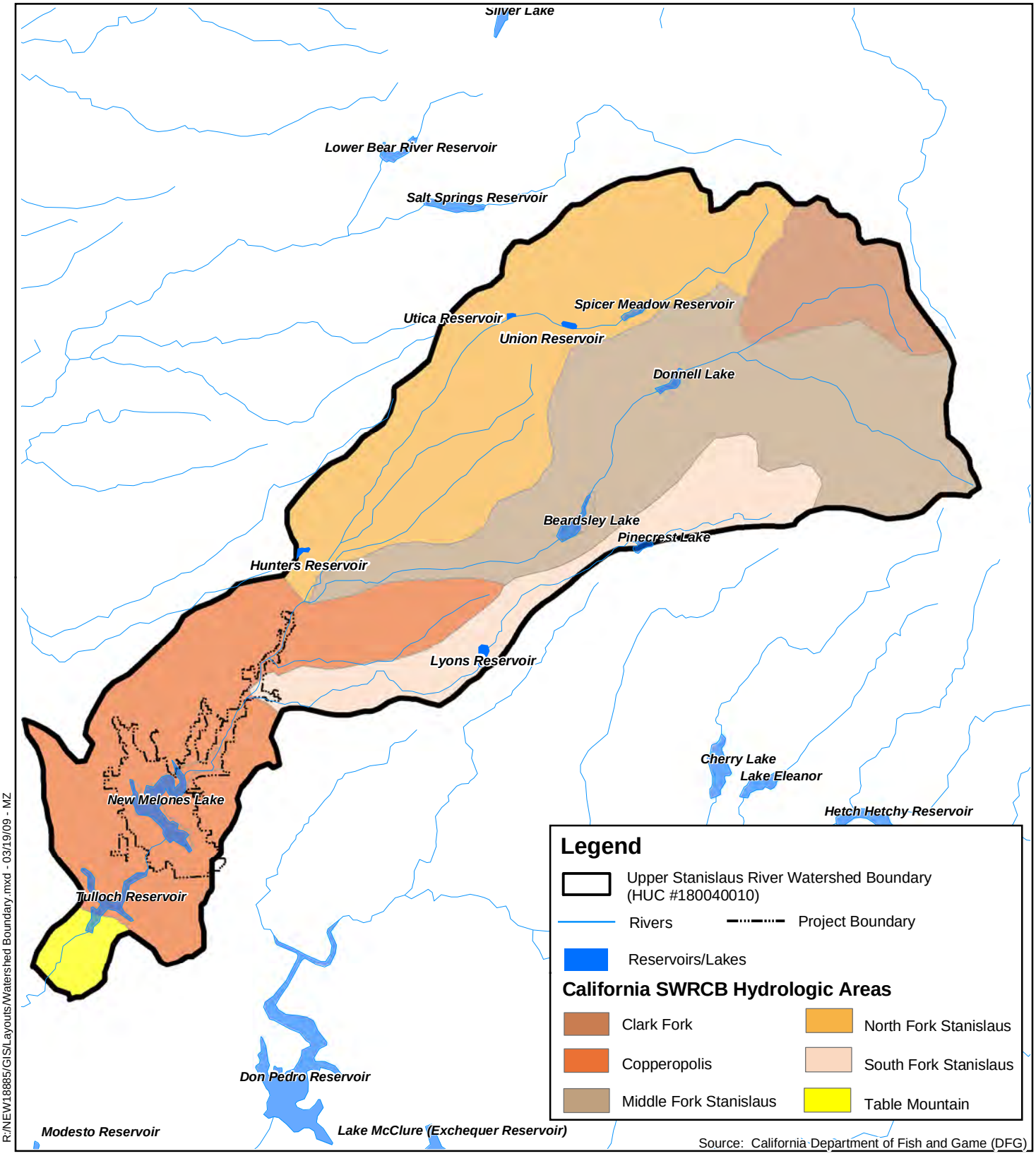
Miles

New Melones Lake Area, California
Central California Area Office

Figure 5-4



Watershed Boundary

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Miles

New Melones Lake Area, California
Central California Area Office

Figure 5-5

exception to this is Coyote Creek, which is spring fed and maintains year-round flows of cold clear water.

With the exception of the Stanislaus River, which contains weirs and other diversion structures, streams on Reclamation lands and their associated riparian areas are largely unaltered from their original conditions, except in cases where historic placer or dredge mining altered surface features. Some modification of stream substrate from recreational gold dredge operations may continue today, but these operations are small and focus on sandy or gravelly substrate that regains its natural form quickly.

Watersheds and Drainage. New Melones Dam is on the Stanislaus River below the confluence of its North, Middle, and South Forks, forming New Melones Lake. Most of the water comes from the North and Middle Forks, with a lesser amount coming from the South Fork drainage. New Melones Lake is in the Upper Stanislaus River watershed, USGS hydrologic unit code 18040010. (This watershed is called the Stanislaus River Hydrologic Unit in the SWRCB hydrologic code system.) Figure 5-5 shows the location of New Melones Lake within the Upper Stanislaus River watershed and several subbasins that have been delineated by the SWRCB. The Upper Stanislaus River watershed has a drainage area of approximately 980 square miles (250 hectares). Over 90 percent of this area (approximately 904 square miles [230 hectares]) drains into New Melones Lake. Those areas draining directly to the lake include the following:

- Subbasins draining directly to the Stanislaus River and New Melones Lake, below the confluence of the North and Middle Forks of the Stanislaus River;
- The portion of the South Fork of the Stanislaus River drainage basin below the confluence of Wet Gulch;
- The lower watersheds of eastern tributaries to the main stem of the Stanislaus River, including the Rose Creek, Knight Creek, and Stony Gulch drainage basins;
- Watersheds of several small eastern tributaries to the main stem, including Experimental Gulch, Sandy Wash, Wolf Gulch, Deadman Gulch, Chile Gulch, Quail Gulch, Grizzly Gulch, Devils Canyon, and Norwegian Gulch;
- Coyote Creek drainage basin below Wades Flat Gulch;
- Small western tributaries to the main stem, including Squirrel Gulch, Snake Gulch, Skunk Gulch, Deep Gulch, Mariana Gulch, Grapevine Gulch, Wool Hollow, Cataract Gulch, and Yea Hoo Gulch;
- Slopes along the eastern portion of the lake, including portions of Mormon Creek, Bear Creek, Jackass Hill, and French Flat; and
- Slopes along the northwestern portion of the lake, including portions of Carson Creek, Greenhorn Creek, Indian Gulch, Indian Creek, Six Mile Creek, Angels Creek, Vonich Gulch, and Texas Charley Gulch.

Upstream of New Melones Lake and within the lake's watershed, the Middle Fork of the Stanislaus is dammed at Beardsley Lake and Donnell Lake. Water from New Melones Lake feeds into Tulloch Lake, located directly downstream.

Water Quality. Water quality refers to physical, biological, and chemical properties of a water body. These properties include temperature, organic content, carbon and dissolved oxygen, turbidity, and pathogen content. Water quality is influenced by vegetation, soil and mineral substrate, livestock and human activities, and the source of the water. Surface water has less mineral content than groundwater and is indicative of the most water entering New Melones Lake.

Water quality issues at New Melones Lake are typical of those found in most reservoirs. Compared to natural lakes or streams, reservoirs may have elevated surface water temperatures in shallow areas or areas with poor circulation, high incidence of suspended sediments from shoreline erosion, high nutrient levels, and diminished dissolved oxygen. Localized water quality problems may occur as a result of recreational boaters, particularly in refueling areas or in areas where boaters congregate.

In some reservoirs, pollution from historic mining sites has been cited as a major water quality issue. Although this has not been reported as a problem at New Melones, its location in the heart of the Mother Lode gold mining region and its proximity to both active and abandoned mines greatly increases the chances that mine-based pollution will find its way into the lake. One of the most likely sources of mine-based pollution is acid mine drainage, which is metal-rich water formed from the chemical reaction between water and rocks containing sulfur-bearing minerals. The runoff formed is usually acidic and frequently comes from areas where ore or coal mining have exposed rocks containing pyrite, which is a sulfur-bearing mineral. Problems that can be associated with mine drainage include contaminated drinking water, disrupted growth, and reproduction of aquatic plants and animals and the corroding effects of the acid on parts of infrastructures, such as bridges (USGS 2008).

Under Section 303(d) of the 1972 Clean Water Act, states, territories, and authorized tribes are required to develop a list of water quality-limited segments. The waters on the list do not meet water quality standards, even after point sources of pollution have installed the minimum required levels of pollution control technology (SWRCB 2004).

The most recent 303(d) list for California is the 2002 list, which the EPA approved in July 2003. The 2002 list indicates that the Lower Stanislaus River is the only water body in the Stanislaus River watershed that is impaired. This segment of the Stanislaus River is at the bottom of the watershed, below both New Melones Lake and Tulloch Reservoir. Water quality impairments for this section of the Stanislaus River include diazinon, group A pesticides, and mercury. Total maximum daily loads (TMDLs) have not been established for these chemicals for this watershed.

A revision to the 303(d) list for California is in progress. The contributors to the draft revision recommend retaining diazinon, group A pesticides, and mercury on the 303(d) list for the Lower Stanislaus River. In addition, chlorpyrifos and water temperature are

proposed to be added. A TMDL for diazinon was expected to be established in 2008, but has not yet been approved (CVRWQCB 2009).

5.2.7 Visual Resources

The New Melones Lake Area is in Calaveras and Tuolumne Counties among the foothills of the west slope of the Sierra Nevada. The primary dominant visual elements are the hills, ridges, small valleys, the patterns created by the vegetation on the hills, and the surface of the lake (Reclamation 1995, 2007a).

The landscape within this region is characterized by relatively steep-sided and rolling hills that range from a few hundred to a thousand feet high (Photographs 1 and 2 in Appendix H) (Reclamation 1995, 2007a). Occasional rock outcrops are also visible (Photograph 3 in Appendix H). Visual contrast is provided by Table Mountain, which forms the watershed boundary to the south and is a long flat-topped ridge of volcanic origin (Photograph 4 in Appendix H).

The dominant natural vegetation is annual grassland and native oak woodlands occurring in varying densities (Photographs 5 to 8 in Appendix H) (Reclamation 2007a). The tree canopy cover and species diversity increases in small draws and valley bottoms where the moisture is more readily available. Gray pine and lower shrub masses are found in drier locations, mixed with oaks in some areas (Reclamation 1995). In summer, the grasses become dry and turn from bright rich green to soft golden yellow.

The New Melones Lake Area occupies two fairly distinct areas contained within the Stanislaus River Canyon: a long, narrow upper reach and the wider main body of the lake (Reclamation 1995). The upper reach of the lake extends north-northeast from the SR 49 Stevenot Stanislaus River Bridge across the middle fork of the Stanislaus River (Photograph 9 in Appendix H) (Reclamation 1995). This part of the lake becomes increasingly narrow from the bridge northward and is characterized by steep-sided slopes which give way to near vertical limestone cliffs in the canyon's far upper reaches. The Camp Nine, Stanislaus River Canyon, Parrotts Ferry, Carson, and Coyote Creek planning units are in this area. Also, the Mark Twain and Carson planning units straddle the SR 49 Stevenot Stanislaus River Bridge. In contrast to the main body of the lake, most of the upper reach resembles an enlarged river rising up the sides of the steep canyon walls (Photograph 10 in Appendix H).

The main body of the lake is south of the SR 49 Stevenot Stanislaus River Bridge. This area of the lake is relatively open, providing expansive views of the lake's primary body of water and the surrounding hillsides (Photograph 11 in Appendix H). Because of the many convolutions in the hills and their steep sides, the shoreline along this part of the lake is quite irregular. It features many fingers that project inward, and branches that extend back for varying distances from the main body of water (Photograph 12 in Appendix H). This configuration prohibits views of the entire main body of the lake surface at one time from any single location. Many areas of the lake are somewhat hidden from view until approached directly by boat. In a few areas, small hills that stood near the original river channel have been surrounded by water with the construction of the lake,

forming islands. These visual features are found in the vicinity of Tuttletown French Flat, Bear Creek, Peoria Wildlife Area, Dam and Spillway, Westside, Greenhorn Creek, and Glory Hole planning units.

In general, the qualities of the scenic landscape increase with distance from the lake. The long, narrow upper reaches have dramatic aesthetic qualities. Farther down the river and around the main body of the lake, the aesthetic qualities of the landscape are compromised by greater development, including administration and recreational facilities, homes in the upper watershed, and a large mine that is visible from the visitor center and other areas (Photographs 13 and 14 in Appendix H).

Due to the orientation of the lake in the river canyon, views of the water and surrounding shoreline are possible only from locations within the basin itself, and usually only from points relatively close to the lake (Reclamation 1995). Views of the upper reach of the lake are generally limited to a vehicular turnout and scenic overlook on the east side of Highway 49 near the west end of the bridge, from recreation areas, from Parrotts Ferry Road, and from Camp Nine Road. In general, views of the main body of the lake are limited to the developed recreation facilities associated with the lake (Tuttletown and Glory Hole Recreation Areas), from the lake surface itself, and to a lesser extent from the SR 49 Stevenot Stanislaus River Bridge.

From some of the higher elevation points near the main body of the lake, such as at the admission/park ranger booth on the entrance road to the Glory Hole Recreation Area, more distant, open, and panoramic views of the basin and portions of the lake are available (Reclamation 1995). Distant features are often the focus of attention, even though details are not readily perceptible (Photograph 15 in Appendix H). From points that are mid-range in terms of elevation with respect to the lake surface and the surrounding ridges, such as some of the day use areas and parking lots above the boat ramps, views become somewhat confined by the surrounding topography and are more focused on the lake and the hillsides that rise from the edge of the water (Photograph 16 in Appendix H). From the shore of the lake and the water's surface, views become oriented out across the water, which is by far the most dominant element of the scene, and up the hillsides to the ridgetops that form the skyline. At these locations, views are relatively confined and tend to be focused on foreground details.

Fluctuation Zone. One of the most striking visual characteristics of the lake basin is the band-like scar created by the high water mark of the lake and zone of former inundation (the area between the present water level and the high water mark), referred to as the fluctuation zone (Photograph 17 in Appendix H) (Reclamation 1995). The fluctuation zone forms a wide horizontal band that completely encircles the lake and stands out in sharp contrast with the hillsides immediately above it. The contrast is created by an abrupt and complete absence of shrubs and trees on the hills below the high water mark resulting in significant differences in texture and color above and below the high water mark. Above the mark, the hillsides appear to be in a relatively natural state with respect to vegetation and land surface. Some portions of the fluctuation zone contain stands of

dead trees and shrubs that were originally inundated but have since been exposed as the water has receded.

Within the upper reach of the lake, riparian vegetation becomes established as the lake recedes (Reclamation 1995). This area begins to resemble its former river corridor as the water course narrows and the shoreline vegetation thickens. However, as water levels rise, it forces the inundation zone farther up into this section of the lake, thereby inundating the reestablished vegetation.

Below the high water mark, and within the main body of the lake, few live trees or shrubs occur (Reclamation 1995). Live vegetation in this zone is limited to grasses and some riparian vegetation, which have become established as the water has receded to its present levels and the area has remained dry. In some locations, minor rock outcrops are visible within this barren zone and in a few areas evidence of erosion can be seen.

Development. The overall visual character of the lake basin is distinctly rural and undeveloped, although there are numerous indicators that the landscape has been strongly affected in several ways by human influence (Reclamation 1995). In general, the most noticeable developed features are the various recreation facilities at the Tuttletown and Glory Hole Recreation Areas (Photograph 18 in Appendix H). However, these features appear relatively minor in scale within the overall visual context of the basin, particularly when viewed from a distance. Widely scattered private residential development within the basin, for the most part, is quite unobtrusive. Communications facilities that exist within the basin, such as hillside microwave towers and antennae, are minor features that do not attract the viewer's attention. Overhead utility lines, while present and noticeable in a few locations, seem to attract little attention.

Prominent human-made features within the basin, aside from the lake, are the spillway situated along the ridge on the west side of the main body of the lake (Photograph 19 in Appendix H) and the Marble Quarry. Also noticeable are the mined hillsides at Carson Hill (Photograph 20 in Appendix H) (Reclamation 1995). The abrupt, strong contrast in color and landform created by the stepped benches, together with their very large scale, are readily evident from many locations and are capable of attracting and holding the viewer's attention. In this way, the features compete for visual dominance with the surrounding hillsides and with the lake itself.

The Tuttletown and Glory Hole Recreation Areas are the two primary locations within the basin where land-based recreation occurs (Reclamation 1995). Both feature a network of roadways providing public access to a host of facilities that serve the needs of visitors. Together, they include campgrounds and boat launch areas consisting of concrete ramps and extensive parking for cars and trailers.

At both Tuttletown and Glory Hole, boat ramps were designed to provide service under differing lake surface elevations (Reclamation 1995). In these cases, the ramps appear on the hillsides as large abandoned slabs of concrete. The New Melones Marina complex is in an inlet within the Glory Hole Recreation Area. The marina complex is contained far

enough back in the inlet that it can be seen only from a few relatively nearby locations or from Tuttletown (across the lake).

Many of the recreation facilities—that is, most campsites and the day use areas—are located among groves of trees, taking advantage of topography to screen views of these uses from other areas (Reclamation 1995). Some facilities, particularly the boat launch ramps and adjacent parking areas, are fully exposed to view.

Some of the smaller recreation areas appear as little more than roadways that disappear beneath the surface of the lake (Reclamation 1995). The Camp Nine Recreation Area at the north end of the lake's upper reach is rustic, and here the water body takes on the appearance of a flowing river corridor rather than a lake, particularly during times of low lake levels.

5.2.8 Vegetation

General Plant Species and Communities

Five broad categories of vegetation are found within the planning area: woodlands, grasslands, wetlands, serpentine, and other. These are subdivided into more specific vegetation associations. The most common plant communities, as well as their acreage and percentage of the planning area can be found in Table 5-4.

Blue oak woodland is the most common, blue oak-foothill pine woodland is the second most common, and annual grassland is the third most common vegetation type within the planning area (Reclamation 1997).

Table 5-4: Plant Communities Found in the Planning Area

Plant Community	Acreage	Percentage of Study Area
Woodlands		
Blue oak woodland	7,915	52 %
Blue oak-foothill pine woodland	2,082	14%
Montane hardwood woodland	592	4%
Montane hardwood-conifer woodland	257	2%
Grasslands and chaparral		
Annual grassland	1,709	11%
Chamise chaparral	1,090	7%
Wetlands		
Valley and foothill riparian woodland	249	2%
Wet meadow	91	< 1%
Vernal pool	53	< 1%
Serpentine-based communities		
Serpentine foothill pine-chaparral	669	4%
Blue oak woodland and serpentine foothill pine-chaparral	84	< 1%

Table 5-4: Plant Communities Found in the Planning Area

Plant Community	Acreage	Percentage of Study Area
Other land use designations		
Not classified	203	1%
Barren land	148	1%
Residential or park	18	< 1%
Total	15,168	

Source: Reclamation 1997

Montane hardwood and montane hardwood-conifer woodlands are the dominant vegetative communities in the northeasterly portion of the planning area. Wetland vegetation is found in some locations along the edges of the lake and in moist canyons. There are many riparian communities, seeps, and wet meadows in the upper reaches of streams that are tributaries of the lake (Reclamation 1995). Each vegetation community is described in detail below.

Blue oak woodland (Sawyer and Keeler-Wolf 1995: blue oak series). In this community, blue oaks average 47 percent of the vegetation cover and grasses make up nearly 100 percent of the understory (Allen et al. 1989 *in* Reclamation 1995). Oaks usually form an open canopy on hills and ridges, usually on slopes of less than 45 percent, particularly on the rolling hills surrounding the lake (Reclamation 1995). Blue oak woodlands grow on all types of soils and parent materials (Allen et al. 1989 *in* Reclamation 1995) and occur in the planning area between 300 and 1,000 feet (90 and 300 meters) in elevation. Characteristic plant species include blue oak (*Quercus douglasii*), bromegrass (*Bromus* sp.), and wild oats (*Avena* sp.). Other species that may be found in blue oak woodland communities are ponderosa pine (*Pinus ponderosa*), California buckeye (*Aesculus californica*), manzanita (*Arctostaphylos* spp.), ceanothus (*Ceanothus* spp.), yerba santa (*Eriodictyon californicum*), foothill pine (*Pinus sabiniana*), scrub oak (*Quercus berberidifolia*), black oak (*Q. kelloggii*), valley oak (*Q. lobata*), interior live oak (*Q. wislizenii*), coffeeberry (*Rhamnus californica*), redberry (*R. crocea*), holly-leaved cherry (*Prunus ilicifolia*), and needlegrass (*Stipa* sp.) (Reclamation 1997).

Blue oak woodland is a common community type within the Tuttletown, Dam and Spillway, Glory Hole, Greenhorn Creek, and Westside Management Areas. It is also the most extensive plant community in the Peoria Wildlife Management Area (PWMA), where it occurs along the southern two-thirds of the access road and is also present at the Peoria Basin trailhead site (Reclamation 2007a). Within the PWMA, blue oak woodlands are particularly prevalent where steep rock outcrops and fields with boulders occur, including the talus slopes of Table Mountain and the rocky slopes overlooking the lake and the dam output. Stands of blue oak woodland also occur in a riparian corridor in the PWMA (Evens et al. 2004).

Blue oak woodlands are common but are under considerable development and grazing pressure in the California foothills (Reclamation 1995). Other activities threatening oaks in the planning area, particularly along the PWMA access road, include illegal OHV

traffic and unregulated camping, fire building, trash dumping, and woodcutting (Reclamation 2007a). Soil compaction from concentrated recreational use, such as camping, also threatens oak trees. In addition, fluctuating levels in New Melones Lake impact oaks because high water levels occasionally inundate and kill lower growing oaks.

Blue oak-foothill pine woodland (Sawyer and Keeler-Wolf 1995: blue oak series). In this community, mixed stands of oak and pine occur. The open oak canopy ranges from 20 to 40 feet (6 to 12 meters) high, with occasional less open pine canopies above. Frequent fire favors blue oak over pine. This community occurs between 500 and 3,000 feet (150 and 920 meters) in elevation (Verner *in* GWH 1988 *in* Reclamation 1995) on steep, rocky, or exposed, largely north-facing sites along ridges or canyons with poor or shallow soils (Holland 1986 *in* Reclamation 1995). Dominant species in this woodland are foothill pine and blue oak, with associated species, including California buckeye, coast live oak (*Quercus agrifolia*), scrub oak, valley oak, interior live oak, poison oak (*Toxicodendron diversilobum*), woodland star (*Lithophragma heterophylla*), sugar cups (*Saxifraga californica*), shooting stars (*Dodecatheon hendersonii*), Chinese houses (*Colinsia heterophylla*), and gooseberry (*Ribes quercetorum*) (Reclamation 1997).

Blue oak-foothill pine woodlands are found in the Westside and Bowie Flat Wildlife Management Areas and PWMA on gentle to moderate slopes with variable parent material. In particular, this community type occurs on all of the slopes at the immediate base of Table Mountain, with foothill pine, blue oak, California buckeye, and toyon as the common species (Ayres 2005; Evens et al. 2004). Additionally, mixed oak woodlands are found in the Bear Creek planning area.

Montane hardwood woodland (Sawyer and Keeler-Wolf 1995: Interior live oak series). Vegetation in this community is broad-leaved and grows up to 50 feet (15 meters), where dense canopy closure and abundant, persistent leaf litter preclude an herbaceous understory (Holland 1986 *in* Reclamation 1995). It occurs on north-facing hillsides farther upstream and at higher elevations (300 to 3,000 feet [91 to 910 meters]) than the blue oak woodland, above the reservoir's historic high water mark (GWH 1988 *in* Reclamation 1995). Slopes where this vegetation occurs are steep to very steep. Dominant plant species include interior live oak, blue oak, buckeye, and California bay laurel (*Umbellularia californica*). Species that are less abundant in the montane hardwood woodland include canyon oak (*Quercus chrysolepis*), elderberry (*Sambucus mexicana*), western redbud (*Cercis occidentalis*), redberry (*Rhamnus crocea*), buck brush (*Ceanothus cuneatus*), and poison oak. Special status plant species that may occur in this woodland include Layne's butterweed (*Packera layneae*) and Red Hills soaproot (*Chlorogalum grandiflorum*) (Reclamation 1995). A more detailed discussion of special status plants can be found in Section 5.2.10 below.

This community type can be found in the Camp Nine Management Area at elevations ranging from 1,500 to 2,000 feet (450 to 610 meters). Upstream of Camp Nine, the Stanislaus River flows through very narrow steep canyons. Montane hardwood woodland vegetation, such as interior live oak, canyon oak, and black oak, is found along the

canyon walls. Stands of this community type occur throughout the PWMA, usually on somewhat steep cool slopes with moderately high rockiness. In particular, it is found on the north-facing slope of Table Mountain and on the metavolcanic slopes overlooking the lake (Evens et al. 2004). In addition, montane hardwood woodland is present along the northern third of the PWMA access road and on the slopes between the road and Table Mountain.

Montane hardwood-conifer woodland (Sawyer and Keeler-Wolf 1995: Black oak series or canyon live oak series). This community occurs most commonly on north-facing slopes (between 25 and 66 percent grade) in canyons upstream of the lake between 1,000 and 2,400 feet (300 and 730 meters) in the planning area. It occurs mainly on soils having sandstone parent material, but metamorphic and igneous parent materials are also known to support this community (Allen et al. 1989 *in* Reclamation 1995). Species of this community are less tolerant of dry conditions than montane hardwood woodland and are adapted to regular but light ground fires (Holland 1986 *in* Reclamation 1995). Dominant species are black oak, canyon oak, interior live oak, and coast live oak. Species that may associate with this community type include foothill pine, California buckeye, mariposa manzanita (*Arctostaphylos viscida*), deer brush (*Ceanothus intergerrimus*), toyon (*Heteromeles arbutifolia*), redbud, mountain mahogany (*Cercocarpus betuloides*), and poison oak (Reclamation 1997).

The composition and diversity of these woodlands has changed as a result of fire suppression throughout California (Reclamation 1997). In particular, densities of incense cedar (*Calocedrus decurrens*) and white fir (*Abies concolor*) have increased in previously ponderosa pine-dominated forests (Vankat 1970, in Reclamation 1997). Continuation of fire suppression policies may further shift the dominant species in the montane woodlands to incense cedar and white fir (Reclamation 1997).

Annual grassland (Sawyer and Keeler-Wolf 1995: California annual grassland series). This vegetation type is characterized by dense to sparse cover of annual grasses and some perennial bunchgrasses. Flower heads are generally one to two feet high, although they may be as tall as eight feet in a moist year. Annual grasslands occur between 800 and 3,000 feet (240 and 910 meters) on relatively flat plains and rolling hills of valleys or on steep slopes of foothill regions. Perennial grasslands are often found on finely textured moist soils. Common annual plant species include wild oats, soft chess (*Bromus mollis*), ripgut (*B. diandrus*), fiddleneck (*Amsinckia* sp.), longbeak stork's bill (*Erodium botrys*), and redstem stork's bill (*E. cicutarium*). Dominant perennial grasses may include triple-awned grass (*Aristida* spp.), wheat grass (*Agropyron* spp.), bent grass (*Agrostis* spp.), wild-rye (*Elymus triticoides*), melic grass (*Melica* spp.), needle-grass (*Stipa pulchra, S. cernua, S. lepida*), and muhly (*Muhlenbergia* spp.). Other plant species that may be associated with grasslands are foothill pine, blue oak, California poppy (*Eschscholzia californica*), and lupines (*Lupinus* spp.) (Reclamation 1997).

Annual grasslands are found within the PWMA and the Bowie Flat and Glory Hole Management Areas. It is the principal plant community on the top of Table Mountain. Throughout these areas, grasslands are often correlated with areas burned in the mid-

1990s or along roads and power lines where native shrub vegetation has been cleared. They are also found on relatively gentle volcanic and serpentine substrates, particularly the long narrow draws on the ridgetop of Table Mountain that collect more soil than the surrounding, more exposed rocky areas of the ridgetop (Evens et al. 2004). Annual grassland also occurs in a narrow band along the PWMA access road and is a component of the understory of the oak woodlands along the PWMA access road corridor. In this area, the characteristic grasses are soft chess, ripgut brome, medusahead (*Taeniatherum caput-medusae*), and Italian ryegrass (*Lolium multiflorum*). The forb component is diverse, composed of both native and nonnative species, including winecup clarkia (*Clarkia purpurea*), popcornflower (*Plagiobothrys* sp.), yellowflower tarweed (*Holocarpha virgata*), sky lupine (*Lupinus nanus*), winter vetch (*Vicia villosa*), and clover (*Trifolium* sp.) (Reclamation 2007a).

Nonnative grasses dominate annual grasslands and cannot realistically be eliminated under current rangeland management practices (Reclamation 1997). Further, grazing livestock and wildlife depend on some introduced species for forage, such as soft chess (*Bromus hordeaceus*), wild oats (*Avena fatua*), slender wild oats (*A. barbata*), and annual ryegrass.

Chamise chaparral (Sawyer and Keeler-Wolf 1995: Chamise series). This community type is dominated by the chamise shrub (*Adenostoma fasciculatum*), generally three to ten feet tall. Vegetation can be very dense, reaching 50 percent cover in 10 years. This community is adapted to frequent fires by stump sprouting, and plants will reach maturity in 25 to 60 years in the absence of fire. Chamise chaparral occurs between 1,000 and 2,000 feet (300 and 610 meters) in elevation on dry, south- or west-facing slopes and ridges. Limestone soils in the middle basin above the reservoir but not far upstream in the lake area support chamise. Species that may co-occur with chamise in this community include several manzanitas (*Arctostaphylos glauca, A. tomentosa, A. viscida*), ceanothus species (*Ceanothus cuneatus, C. papillosus*), mountain mahogany, buckwheat (*Eriogonum fasciculatum*), yerba santa, deer brush, holly-leaf cherry, and scrub oak (Reclamation 1997).

Chamise chaparral occurs on various substrates throughout the PWMA (Evens et al. 2004). This community type is intermixed with oak woodland in the PWMA access road corridor (Reclamation 2007a). In addition, several stands were located on the volcanic ridgetop of Table Mountain (Evens et al. 2004).

Valley and foothill riparian woodland (Sawyer and Keeler-Wolf 1995: California sycamore series). Vegetation in this community consists of tall, dense, winter-deciduous, broad-leafed, riparian forest whose canopy may be closed with a shade-tolerant understory. It grows on relatively fine-textured alluvium, somewhat receded from river channels, in the floodplains of low gradient streams and rivers. Dominant species in this community include box elder (*Acer negundo californica*), sycamore (*Platanus racemosa*), Fremont cottonwood, and several willow species (*Salix gooddingii variabilis, S. laevigata, S. lasiandra*). White alder (*Alnus rhombifolia*) and big-leaf maples (*Acer macrophylla*) are less common species (Reclamation 1997). California vervain (*Verbena*

californica) is a special status plant species that may grow in valley and foothill woodlands, particularly near streams that run through serpentine areas, as in the northernmost reach of the north fork of the Stanislaus River (Reclamation 1997).

Little riparian vegetation exists along the shoreline because fluctuating water levels make it hard for riparian vegetation to become established (Reclamation 1997). Riparian vegetation is more commonly found in the upstream reaches of some of the perennial drainages that flow into the reservoir, within the Stanislaus River Arm, Tuttletown, Greenhorn Creek, Carson, and Coyote Creek Management Areas. Other management areas that support riparian vegetation are Camp Nine, Parrotts Ferry, Mark Twain, Bear Creek, and Dam and Spillway.

Wet meadow (Sawyer and Keeler-Wolf 1995: Sedge series). This community is composed of generally grass (or grasslike) species and forbs, ranging from six inches to three feet (15 cm to 1m) high. Cover may be sparse to dense, depending on the intensity of grazing, if any. In the planning area, wet meadows are found at elevations between 800 and 2,000 feet (240 to 610 meters). This natural community develops on flats or in bowl-like basins, which may have rapid drainage or none at all. Soils may vary from 20 percent organic material to sandy loam with almost no organic material. In wet meadows, water is at or near the soil surface most of the growing season, rather than having standing water (Holton Associates 1987 *in* Reclamation 1997). They may dry up in the summer or stay ponded all year. Meadow-type indicator species include short-hair sedge (*Carex exserta*), shorthair (*Calamagrostis breweri*), gentian-aster (*Gentian newberryi aster* sp.), few-flowered spikerush (*Heleocharis pauciflora*), carpet clover (*Trifolium monathum*), bentgrass (*Agrostis scabra*), pull-up muhly (*Muhlenbergia filiformis*), beaked sedge (*Carex rostrata*), Nebraska sedge (*C. nebrascensis*), Kentucky bluegrass (*Poa pratensis*), longstalk clover (*Trifolium longipes*), and tufted hairgrass (*Deschampsia caespitosa*) (Ratliff 1982 *in* Reclamation 1995). Special status plant species that grow in wet meadows are California vervain and Ahart's dwarf rush (*Juncus leiospermus* var. *aharti*).

Field observations at the Angels Creek arm, conducted by Reclamation in 1997, found no typical wet meadow community or topography, despite previous documentation of wet meadows in this planning area (Reclamation 1995). However, the bunch grass (reed canarygrass) found on a hillside at Angels Creek grows in moist areas, indicating a seep-like condition, which is considered a wetland community (Reclamation 1997). Such a unique upland site with more available water than the surrounding upland areas increases wildlife habitat values and the overall biodiversity at the lake.

Vernal pool (Sawyer and Keeler-Wolf 1995: Northern basalt flow vernal pools). Vernal pools are an ephemeral wetland vegetative community with predominantly low-growing ephemeral herbs. Germination and early growth occur in winter and early spring, often while plants are submerged, and pools dry out by summer. Flowering is often in bands at the margins of the pools. This community type occurs in shallow depressions, ranging from a few meters to tens of meters in diameter. Characteristic plant species found in vernal pools are Pacific foxtail (*Alopecurus saccatus*), common blennosperma

(*Blennosperma nanum*), Cleveland's shooting star (*Dodecatheon clevelandii* var. *patulum*), toothed downingia (*Downingia cuspidata*), spiny-sepaled button-celery (*Eryngium spinosepalum*), hedge-hyssop (*Gratiola ebracteata*), Fremont's goldfields (*Lasthenia fremontii*), Douglas' meadowfoam (*Limnanthus douglasii* var. *rosea*), white-headed navarretia (*Navarretia leucocephala* ssp. *leucocephala*), adobe popcorn flower (*Plagiobothrys acanthocarpus*), miniature popcorn flower (*P. stipitatus* var. *micranthus*), Sacramento pogogyne (*Pogogyne zizyphoroides*), Delta woolly marbles (*Psilocarphus brivissimus* var. *multiflorus*), greater duckmeat (*Spirodela polyrrhiza*), and Wildenov's clover (*Trifolium willdenovii*) (Stone et al. 1993 *in* Reclamation 1995). Special status plant species that may grow in the planning area vernal pools include Tuolumne button-celery (*Eryngium pinnatisectum*), spiny-sepaled button-celery (*Eryngium spinosepalum*), and pincushion navarretia (*Navarretia myersii* ssp. *myersii*).

Within the planning area, ephemeral pools appear after rainfall or snowmelt on top of Table Mountain, between 1,200 feet (360 meters) in elevation in the south and 2,600 feet (790 meters) in the north. Although these pools share some of the characteristics of some vernal pools in the Central Valley, they are not true vernal pools in that they do not have a clay under layer that prevents percolation. Instead, they form in swales in the rocky surface of Table Mountain. The soil is poorly drained and the parent material on Table Mountain is a Pliocene lava flow (andesite). Intermittent pools occur on Table Mountain in seasonally wet to saturated rocky meadows that have slight soil development (Evens et al. 2004). They are interspersed within the annual grassland (Reclamation 2007a). Intermittent pools at Table Mountain do not support the range of species found in vernal pools in the Central Valley, possibly due to differences in substrate (primarily shallow, rocky substrate versus clay substrate in valley vernal pools). Although vernal pool habitats are very delicate and easily disturbed in general, this is even more pronounced on Table Mountain, where soils are poor, shallow, and loose.

To date, vernal pools have resisted invasion by exotic plant species, probably due to their ephemeral nature (Reclamation 1997). However, the scientific community is concerned that exotic plants may colonize vernal pool communities, possibly displacing the highly specialized native vernal pool species (Reclamation 1997). Despite these concerns, there is no supporting evidence that this change is occurring in vernal swales found on Table Mountain (Reclamation 1997).

Serpentine foothill pine-chaparral (Sawyer and Keeler-Wolf 1995: Foothill pine series). This natural community consists of an open woodland with some chaparral on Redhills soils derived from serpentine. Serpentine soils are high in magnesium, iron, silicates, and asbestos and low in nitrogen and phosphorus (Reclamation 1997). Serpentine soils in the planning area are of the Delpiedra and Henneke Series. The Redhills form a rounded rolling terrain and occur at elevations between 800 and 2,000 feet (240 and 610 meters). Characteristic plant species on Delpiedra soils are foothill pine and buckbrush, while on Henneke soils manzanitas (*Arctostaphylos manzanita* and *A. viscida*), chamise, and toyon are prevalent. A number of special status plant species prefer serpentine foothill-pine chaparral habitat, including Rawhide hill onion (*Allium tuolumnense*), Chinese Camp brodiaea (*Brodiaea pallida*), Red Hills soaproot, Congdon's lomatium (*Lomatium*

congdonii), shaggyhair lupine (*Lupinus spectabilis*), Layne's butterweed, and California vervain.

Stands of this community type have been found in the southwest and lower central portions of the PWMA on serpentine parent material (Evens et al. 2004). Serpentine soils provide habitat for only very specialized plant species that are highly adapted to the relatively inhospitable soil type. There is no evidence of ecological stages in serpentine vegetation (Kruckberg 1984, *in* Reclamation 1997); therefore, unless severely disturbed by humans or natural causes, the composition and structure of serpentine-based vegetative communities at the New Melones Lake will likely change little over time.

Blue oak woodland and serpentine foothill pine-chaparral (Sawyer and Keeler-Wolf 1995: foothill pine series). This type of chaparral is similar to serpentine foothill pine-chaparral, with blue oaks interspersed throughout. It occurs upland on gentle to steep slopes. Soils are shallow, infertile, moderately to excessively drained. The soil surface may be covered with stones and rock outcrops. Foothill pine emerges from a shrub canopy composed of blue oak, black oak, California buckeye, coast live oak, Coulter pine, interior live oak, valley oak, and western juniper. Vegetation height is less than 70 feet (20 meters) and occurs at elevations of between 1,000 and 7,000 feet (300 and 2,100 meters).

Serpentine chaparral plant communities can be found in the Stanislaus River Canyon, PWMA, and Dam and Spillway planning areas (Reclamation 1995).

Sensitive Habitat Types

Several sensitive habitat types, as listed by the CDFG due to their rarity and threat, occur in the planning area. These are serpentine communities and wetlands, such as vernal pools and valley and foothill riparian woodlands.

Serpentine communities. Serpentine is considered an ultramafic rock formation, meaning that it is high in ferromagnesian silicate minerals (Kruckberg 1984, USFWS 2002 *in* Ayres 2005). These minerals produce soils with several unique characteristics, including low calcium levels, high magnesium levels, high concentrations of heavy metals (especially iron, chromium, and nickel), and nitrogen, potassium, and phosphorus levels below that needed to grow agricultural crops (Kruckberg 1984 *in* Ayres 2005). These chemical characteristics usually co-occur with a distinctive vegetation pattern of sparse amounts of plant biomass, even in areas known for their productivity, such as coastal forests. The sparse vegetation in these environments contributes to low turnover of nitrogen and phosphorus, high temperatures, high water stress, and low soil stability (Kruckberg 1984, USFWS 2002 *in* Ayres 2005). The coexistence and interdependence of these biochemical factors in the same environment has been dubbed the serpentine effect (Kruckberg 1984 *in* Ayres 2005). However, this sparse vegetation is also characterized by a high degree of endemic plant species (found only in California or only on West Coast serpentine). In California, endemic serpentine species make up ten percent (215 species) of the total endemic flora of California (2,125 species), while serpentine soils make up only 0.6 percent of the area of California (Raven and Axelrod 1978; Kruckberg

1984, *in* Ayres 2005). In addition, many of these endemic species are endangered, threatened, or rare. Of the five federally listed plant species potentially occurring in the planning area, three are found on serpentine soils. This community's small land area and high proportion of endemic plant species makes it particularly important to the preservation of biodiversity. Further, the barren appearance of serpentine communities falsely indicates that they lack ecological value; as a result, they are threatened by disturbance and degradation (e.g., grazing or mining) (Reclamation 1997). Serpentine communities are found within the Westside, Peoria Wildlife Area, and Dam and Spillway planning units.

Wetlands. In California's Mediterranean climate, with hot dry summers, wetlands have always been scarce and limited in size. These small isolated areas are very productive because associated plants have longer growing periods. Further, wetlands are valuable to animals because they provide abundant food and water. Since the distribution of wetlands has generally declined, associated plants and animals have, in some cases, become rare and endangered (Reclamation 1995). Further, wetlands play a critical role in the watershed as the most productive of all ecosystems, as habitat for many sensitive plant and wildlife species, as flood control areas, as natural water quality purification systems, and as buffers against erosion (Reclamation 1995). Wetlands are found in all planning areas.

Vernal pools. The ponded water in vernal pools prevents annual grasses and other introduced forbs from growing in these depressions. Instead, the depressions are host to a number of native plants that may be limited in distribution to the pools of one particular area. Many vernal pool plants are known for their medicinal value (BLM 2006). Frequently, the endemic plant species are considered endangered or threatened due to lack of habitat caused by development and urban encroachment (Reclamation 1995). Due to their ephemeral nature, vernal pools provide habitat for short-lived invertebrates and breeding habitat for amphibians, such as the Pacific tree frog and western toad. Species that inhabit surrounding grasslands may also use the pools as a temporary water source. An extremely seasonal water regime provides foraging habitat for waterfowl and a number of bird species during spring migrations, as well as habitat for endemic species specifically adapted to vernal pool soil conditions (Reclamation 1995). More than 70 rare species are restricted to vernal pools, with new species discovered regularly (BLM 2006).

Only about 10 to 25 percent of the vernal pools that originally occurred in California remain. The two biggest threats to vernal pools now are development and agricultural conversion (USFWS 2007a). Vernal pools have not been documented in the New Melones Lake Area, although vernal swales may be found on the top of Table Mountain.

Valley and foothill riparian woodland. Riparian areas along larger streams that are tributaries of New Melones Lake provide important habitat for a diverse array of species, including nesting habitat for a great variety of birds. More than 225 species of mammals, birds, reptiles, and amphibians rely on riparian areas. These shaded, moist, and typically well-vegetated corridors serve as escape cover and facilitate movement and dispersal of several species, such as black-tailed deer. Perennial stream courses also provide a year-

long source of water for mammals, reptiles, and amphibians; a large range of species require riparian zones for breeding and foraging needs (Reclamation 1995).

Riparian systems are vulnerable and are easily altered by human activities. Even a slight change in the vegetation can modify the flow of the system, the temperature and pH of the water, the amount of oxygen in the water, and even the substrate. All of these changes have a subsequent impact on the species that depend on the systems. River corridors and riparian areas with natural flows and qualities are becoming a diminished resource throughout all of California (BLM 2006). Riparian woodlands can be found in the Camp Nine, Stanislaus River Canyon, Parrotts Ferry, Mark Twain, Tuttletown, French Flat, Bear Creek, Dam and Spillway, Greenhorn Creek, Carson, and Coyote Creek Planning Areas.

5.2.9 Fish and Wildlife

Fish

The Stanislaus River and New Melones Lake are part of the Sacramento-San Joaquin drainage system, a large interior system draining the west slope of the Sierra Nevada Mountains, the east slope of the Coast Ranges, and the southern Cascade Mountains, Warner Mountains, and Goose Lake to the north (Reclamation 1995). The native fish of the Stanislaus River likely included spring-run Chinook salmon (*Oncorhynchus tschawytscha*), rainbow trout (*O. mykiss)*, Sacramento sucker (*Catostomus occidentalis)*, large minnows, such as hardhead (*Mylopharodon conocephalus*), Sacramento squawfish (*Ptychocheilus grandis)*, hitch (*Lavinia exilicauda*), and one or two species of sculpin (*Cottus* spp.). Some of the numerous fish species introduced by humans to the Sacramento-San Joaquin system likely also colonized the Stanislaus River prior to dam construction, and others, such as bass (*Micropterus* spp.) and catfish (*Ictalurus catus, I. nebulosus, I. punctatus*), have been introduced to New Melones Lake as sport fish.

The fish species known to occur or most likely to occur in the reservoir or its tributaries are listed in Table 5-5.

Table 5-5: Fish Species of New Melones Lake

Common Name	Scientific Name	Origin	Comments
Minnows and Carps	**Cypriniformes**		
Sacramento sucker	*Catostomus occidentalis*	N	C
Common carp	*Cyprinus carpio*	I	C
Hitch	*Lavinia exilicauda*	N	P
Hardhead	*Mylopharodon conocephalus*	N	P
Golden shiner	*Notemigonus crysoleucas*	I	C
Sacramento blackfish	*Orthodon microlepidotus*	N	C
Sacramento squawfish	*Ptychocheilus grandis*	N	C
Catfish	**Siluriformes**		
White catfish	*Ictalurus catus*	I	C
Brown bullhead	*I. nebulosus*	I	C

Table 5-5: Fish Species of New Melones Lake

Common Name	Scientific Name	Origin	Comments
Channel catfish	*I. punctatus*	I	C
Trout and Salmon	**Salmoniformes**		
Rainbow trout	*Oncorhynchus mykiss*	N	C
Kokanee salmon	*O. nerka*	I	C
Brown trout	*Salmo truna*	I	C
Livebearers	**Cyprinodontiformes**		
Western mosquitofish	*Gambusia affinis*	I	P
Scorpion Fish	**Scorpaeniformes**		
Prickly sculpin	*Cottus asper*	N	P
Riffle sculpin	*C. gulosus*	N	P
Perch, Freshwater Sunfish	**Perciformes**		
Green sunfish	*Lepomis cyanellus*	I	C
Bluegill	*L. macrochirus*	I	C
Red-eye bass	*Micropterus coosae*	I	C
Spotted bass	*M. punctularus*	I	C
Largemouth bass	*M. salmoides*	I	C
White crappie	*Pomoxis annularis*	I	C
Black crappie	*P. nigromaculatus*	I	C

Notes: N = native species, I = introduced species, C = confirmed, P = probable, U = unlikely
Sources: USGS 2007, Lewis 2008

Chinook salmon are restricted to the river downstream from New Melones Lake, although the CDFG successfully planted them in the lake in 1985 to enhance the sport fishery. Those salmon are no longer present, and a Chinook salmon fishery in the lake could be maintained only by regular stocking. The present sport fishery in the lake is focused on rainbow and brown trout (*Salmo truna*), largemouth bass (*Micropterus salmoides*), other sunfishes, such as black crappie (*Pomoxis nigromaculatus*) and bluegill, and three species of catfish. Kokanee salmon (*Oncorhynchus nerka*), which are land-locked sockeye salmon, were introduced to the lake in 1997. The CDFG annually stocks rainbow trout, Kokanee salmon, and brown trout, while largemouth bass are stocked in smaller numbers by local bass clubs, with guidance from the CDFG (Lewis 2008).

The large native minnows and suckers, and introduced carp, although edible and catchable, are generally ignored by sport fisherman. The bass, crappie, bluegill, and smaller species of catfish (white catfish and brown bullhead) are regarded as shallow-water, warm-water species, and are sought by fisherman. These fish are caught in the warm upper layer of water on New Melones Lake, mainly around the shoreline. The catfish live on the soft lake bottom, whereas the bass and crappie typically occupy territories offering some kind of cover, such as snags, logs, rocks, and emergent plants. Thus, prime areas for fisherman seeking sunfishes are shorelines with a lot of relief, such as cliffs or rock outcrops, and especially those narrow arms and coves with many

drowned trees, logs, and marsh areas. Shorelines from which trees and brush have been cleared for aesthetic or other purposes are much less important to these species.

Rainbow trout, brown trout, and the large channel catfish are generally restricted to colder, deeper water during the summer when New Melones Lake has two distinct thermal layers of water, although large brown trout and channel catfish are often caught in shallow water near steep banks at night, when they ascend in search of food. Rainbow trout generally feed in deep water during the daytime and feed in shallower areas at night. In fall, when the lake "turns over," thermal stratification disappears and both species of trout may be caught in shallower water through winter and spring. Trout are also vulnerable to shallow-water fishing in tributary arms in late summer, when they enter tributaries to spawn.

The lake's perennial tributary streams and their associated lake arms are critically important aquatic habitat. The cool clean water and gravel beds of these tributaries are likely to be trout spawning and rearing areas. Artificial habitat was created at the time of construction.

Wildlife

The planning area contains a diverse range of wildlife habitats typical of the lower Sierra Nevada foothills, including open water, riparian, and oak woodland communities in the lower lake area to montane hardwood and montane hardwood-conifer woodlands in the upstream canyon area. Consequently, a diverse range of bird, mammal, reptile, amphibian, and invertebrate species are also present. Numbers and species of birds vary by season, habitat, weather, and migration patterns. Section 5.2.8 (Vegetation) contains additional information on vegetation communities that make up wildlife habitats. The following sections describe wildlife resources by habitat type.

Open Water and Riparian Areas. The open water of New Melones Lake, along with associated shoreline vegetation, provides foraging and resting habitat for a variety of waterfowl and shorebirds, such as ruddy duck (*Oxyura jamaicensis*), ring-necked duck (*Aythya collaris*), and mallard ducks (*Anas platyrhynchos*), grebes, and coots. Several fish-eating bird species, such as grebes, forage in the open water; other species, such as ducks, herons, and egrets, dabble along the shoreline foraging on seeds and small fish in shallow areas.

Trees along the shoreline provide nesting substrate adjacent to preferred foraging habitat for some of these species, such as osprey. Riparian areas along larger tributaries to New Melones Lake provide important habitat for a diverse species assemblage. These shaded, moist, and typically densely vegetated corridors provide food, cover, water, and nesting habitat, and they serve as travel corridors for species such as black-tailed deer (*Odocoileus hemionus columbianus*). Perennial streams provide a year-long source of water for mammals, reptiles, and amphibians. A large assortment of species, including several bird species, require riparian zones for breeding and foraging needs.

Oak woodlands. Oak woodlands are interwoven with grasslands at lower elevations and more conifer-dominated woodlands at higher elevations. In association with a grassy understory, oak woodlands cover virtually all of the gently rolling hills that surround New Melones Lake. Where oak woodland occurs adjacent to open grasslands, many species move between and use resources provided by both communities. Oak woodlands provide important food resources, such as acorns, fungi, lichens, galls, and mistletoe. They also provide shelter, shade, and nesting sites for numerous species, including mule deer (*Odocoileus hemionus californicus*), which winter in the Railroad Flat area, black-tailed deer, which winter in the Stanislaus River Canyon and Parrotts Ferry areas, western grey squirrel (*Sciurus griseus*), gray fox (*Urocyon cinereoargenteus*), raccoon (*Procyon lotor*), feral pig (*Sus scrofa*), striped skunk (*Mephitis mephitis*), mountain lion (*Felis concolor*), bobcat (*F. rufus*), California quail, wild turkeys, woodpeckers, and mourning doves. Tree cavities provide nesting opportunities for several species. The PWMA contains large areas of representative high quality oak woodlands.

Grasslands. While grasslands offer relatively few roosting or nesting sites for birds, they provide a large number of seeds for seed-eating species, such as mice, voles, quail, meadowlarks (*Sturnella neglecta*), horned larks (*Eremophila alpestris*), and sparrows. These species, in turn, provide food for predatory species, such as black-shouldered kite (*Elanus caeruleus*), northern harrier (*Circus cyaneus*), great horned owl (*Bubo virginianus*), red-tailed hawk (*Buteo jamaicensis*), and Swainson's hawk (*B. swainsoni*), which nest and roost in adjacent oak woodlands, wetlands, and riparian areas.

Chaparral. Often merging with oak woodlands and grasslands, chaparral provides large amounts of dead material and leaf litter, as well as almost impenetrable cover, for reptiles, birds, and smaller mammals. Although not restricted to this habitat type, fence lizards (*Sceloporus occidentalis*), quail, wren tits (*Chamaea fasciata*), deer mice (*Peromyscus maniculatus*), feral pigs, California thrashers (*Toxostoma redivivum*), and bobcats often use chaparral communities for cover and forage.

Table Mountain. The Table Mountain area, located primarily to the west and south of New Melones Lake, includes unique habitat conditions and opportunities not found elsewhere in the vicinity. The relatively steep cliffs and ledges (including caves and crevices) associated with Table Mountain provide nesting and roosting substrate required by several bird and bat species, several of which are special status species described in Section 5.2.10. On the top of Table Mountain, vernal swales are interspersed with grassland and rock. Due to their short-lived nature, vernal swales provide habitat for short-lived invertebrates and breeding habitat for amphibians, such as Pacific tree frog (*Hyla regilla*). Species that inhabit surrounding grasslands may also use the pools as a temporary water source. An extremely seasonal water regime in this habitat type provides foraging habitat for waterfowl and other birds in the spring, as well as habitat for endemic species specifically adapted to vernal swale conditions.

Montane hardwood. Once established, the montane hardwood community is relatively stable, with a dense canopy and supporting wildlife species that rely on acorns as a primary food source or that browse on hardwood foliage. The forest floor, as opposed to

lower elevation oak woodlands, is covered by a persistent leaf litter that provides habitat for many species of amphibians and reptiles. Representative wildlife species found in this community include gray fox, coyote (*Canis latrans*), striped skunk, opossum (*Didelphis virginiana*), quail, wild turkey, band-tailed pigeon (*Patagioenas fasciata*), Nuttall's woodpecker (*Picoides nuttallii*) and acorn woodpecker (*Melanerpes formicivorus*), scrub jay (*Aphelocoma californica*) and Steller's jay (*Cyanocitta stelleri*), titmouse, western gray squirrel, dusky-footed woodrat (*Neotoma fuscipes*), black-tailed deer, black bear (*Ursus americanus*) in the Camp Nine region, mountain lion, bobcat, California mountain kingsnake (*Lampropeltis zonata*), and western rattlesnake (*Crotalus viridis*). Special status species that use this habitat type are described in Section 5.2.10.

Montane hardwood-conifer. This typically climax community supports a variety of wildlife species and is transitional between dense coniferous forests and montane hardwood, mixed chaparral, or open oak woodlands and savannahs. Mature trees provide nest cavities and acorns for some birds and mammals. Variability in canopy cover and understory vegetation provides structural diversity within this community. Representative wildlife species include mule deer, mountain lion, bobcat, pine siskin evening grosbeak (*Pinicola enucleator*), Steller's jay, western bluebird (*Sialia mexicana*), western tanager (*Piranga ludoviciana*), acorn woodpecker, wild turkey, western rattlesnake, and gopher snake (*Pituophis catenifer*). Special status species associated with this community are described in Section 5.2.10.

Limestone Caves/Outcrops. Some limestone caves and outcrops provide temperature, light, and moisture suitable for endemic invertebrate species. Cave and cavity-dwelling mammals, such as bats, may also find suitable habitat in these features. Two genera of bats, *Myotis* and *Corynorhinus* (*Plecotus*), are known to use the caves for roosting and breeding. The interior of some caves provides unique habitats where over 50 species of invertebrates have developed adaptations specific to the cave conditions. Several species of special status bats and invertebrates have been found in this type of habitat in the region and are described in Section 5.2.10.

When New Melones Dam was constructed, many limestone caves were inundated, and species' habitats were lost. To mitigate these effects on the New Melones harvestman (*Banksula melones*), a type of rare spider, the USACE transplanted individuals of this species to other caves that would not be affected by inundation. Monitors of these transplants have found that they have successfully become established in the caves where they were transplanted (CDFG 2009).

Game species. Hunting is permitted in the New Melones Lake Area and is regulated by the CDFG. Game species include waterfowl, mourning dove (*Zenaida macroura*), California quail (*Callipepla californica*), wild turkey (*Meleagris gallopavo*), and deer (See Section 5.2.22 for further discussion of hunting opportunities).

5.2.10 Special Status Species

Federally Endangered, Threatened, Proposed, or Candidate Species of Wildlife

There are eleven species or subspecies that are listed as threatened or endangered under the federal Endangered Species Act that could occur and be affected by projects in Calaveras or Tuolumne Counties (Table 5-6) (USFWS 2009). In addition six species are candidates for listing. No species that occur in the counties are currently proposed for listing.

Table 5-6: Federal Threatened, Endangered, Proposed, and Candidate Wildlife Species That Occur in or That May Be Affected by Projects in Calaveras and Tuolumne Counties

Scientific Name	Common Name	Habitat	Status E=Endangered T = Threatened C = Candidate SC = Species of Concern DL = Delisted CH = Critical Habitat	Potential Occurrence in the Planning Area C = Confirmed P = Possible U = Unlikely
Invertebrates				
Branchinecta lynchi	Vernal pool fairy shrimp	Vernal pools	T	U
Desmocerus californicus dimorphus	Valley elderberry longhorn beetle	Riparian habitats and associated upland habitats where elderberry grows	T	P
Lepidurus packardi	Vernal pool tadpole shrimp	Vernal pools	E	U
Fish				
Oncorhynchus clarki henshawi	Lahontan cutthroat trout	Lahontan Basin of northern Nevada, eastern California, and southern Oregon	T	U
O. clarki seleniris	Paiute cutthroat trout	Watershed of Silver King Creek and its isolated tributaries in Alpine County	T	U
O. mykiss	Central Valley steelhead	Sacramento and San Joaquin Rivers and their tributaries (excluding steelhead from San Francisco and San Pablo Bays and their tributaries)	T CH	U
O. tshawytscha	Winter-run Chinook salmon, Sacramento River	Sacramento River and its tributaries in California	E	U

Table 5-6: Federal Threatened, Endangered, Proposed, and Candidate Wildlife Species That Occur in or That May Be Affected by Projects in Calaveras and Tuolumne Counties

Scientific Name	Common Name	Habitat	Status E=Endangered T = Threatened C = Candidate SC = Species of Concern DL = Delisted CH = Critical Habitat	Potential Occurrence in the Planning Area C = Confirmed P = Possible U = Unlikely
Amphibians				
Ambystoma californiense	California tiger salamander, central population	Vernal pools and permanent waters in grasslands; burrows in adjacent upland sites	T CH	U
Bufo canorus	Yosemite toad	Lakes or ponds with grassy margins, wet meadows, and quiet areas of streams above 4,800 feet (1,460 meters) elevation	C	U
Rana aurora draytonii	California red-legged frog	Aquatic habitat (for breeding); use a variety of habitat types, including riparian and upland areas	T CH	P
R. muscosa	Mountain yellow-legged frog	Rocky and shaded streams with cool waters above 4,500 feet (1,460 meters) elevation	C	U
R. sierrae	Sierra Nevada yellow-legged frog	Rocky and shaded streams with cool waters at high elevation	C	U
Reptiles				
Thamnophis gigas	Giant garter snake	Inhabits natural and artificial wetlands, irrigation supply and drainage canals, freshwater marshes, sloughs, ponds, and other aquatic habitats	T	U
Birds				
Coccyzus americanus occidentalis	Western yellow-billed cuckoo	Deciduous riparian woodlands, especially dense stands of cottonwood and willow	C	P

Table 5-6: Federal Threatened, Endangered, Proposed, and Candidate Wildlife Species That Occur in or That May Be Affected by Projects in Calaveras and Tuolumne Counties

Scientific Name	Common Name	Habitat	Status E=Endangered T = Threatened C = Candidate SC = Species of Concern DL = Delisted CH = Critical Habitat	Potential Occurrence in the Planning Area C = Confirmed P = Possible U = Unlikely
Synthliboramphus hypoleucus	Xantus's murrelet	Islands off the Pacific coastline	C	U
Mammals				
Martes pennanti (pacifica) DPS	Fisher	Mature coniferous forest and dense riparian habitats at high elevations	C	U
Vulpes macrotis mutica	San Joaquin kit fox	Annual grasslands with scattered shrubs and loose soils for burrowing	E	U

Source: USFWS 2009

The valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) occurs in association with elderberry (*Sambucus* spp.) shrubs in riparian areas and oak savanna habitats. Because these habitat types and elderberry occur in the New Melones Lake Area and the species has been documented nearby, it is possible that the species occurs in the planning area.

The California red-legged frog (CRLF) (*Rana aurora draytonii*) inhabits a variety of aquatic habitats, usually with submerged and emergent vegetation. CRLF typically inhabit the margins of still or very slow water where bordering and aquatic vegetative cover is very dense and large populations of forage species occur, including aquatic macroinvertebrates, rodents, and Pacific tree frogs (*Hyla* [=*Pseudacris*]) regilla) (Storer 1925; Hayes and Tennant 1986; Hayes 1989; Jennings and Hayes 1994 *in* Barry 2007). Most of the low gradient riparian stream zones that may have offered this type of habitat in the New Melones Lake Area were inundated when the lake was filled, and any such habitat in the planning area is remnant and fragmented at best. A 2006-2007 survey of Sierra Nevada foothill streams in the counties north of the project area found that the nearest extant population of CRLFs was west of New Hogan Lake, approximately 25 miles (40 kilometers) northwest of the project area (Barry 2007). A valid historical record of a CRLF sighting occurred near Columbia, approximately five miles from the lake, but this record was not confirmed during the recent survey. The overall results of this survey indicated that although CRLFs can and do occupy streams at similar elevations as those in the New Melones Lake Area, populations are relatively rare and depend on high-quality habitat.

No records exist of CRLFs in streams in the planning area, and there is a low probability that the species occurs in the planning area.

The rest of the listed species that could occur in the counties are unlikely to occur in the New Melones Lake Area due to lack of appropriate habitat or documented range, including elevation.

Federally Endangered, Threatened, Proposed or Candidate Species of Plants

The project area encompasses portions of Tuolumne and Calaveras Counties. Within these counties, the five federally listed plant species that may occur include Ione manzanita (*Arctostaphylos myrtifolia*), Chinese Camp brodiaea (*Brodiaea pallida*), Hartweg's golden sunburst (*Pseudobahia bahifolia*), Layne's ragwort (*Packera layneae*), and California vervain (*Verbena californica*) (USFWS 2009). These are presented in Table 5-7 and are described in detail below.

Table 5-7: Federally Endangered, Threatened, Proposed, or Candidate Plant Species That Occur in or That May Be Affected by Projects in Calaveras and Tuolumne Counties

Scientific Name	Common Name	Preferred Habitat	Status E= Endangered T = Threatened	Potential Occurrence in the Planning Area C = Confirmed P = Possible U = Unlikely
Arctostaphylos myrtifolia	Ione manzanita	Chaparral or oak-dominated, open-canopied woodlands	T	U
Brodiaea pallida	Chinese Camp brodiaea	Valley and foothill grassland, vernal swales, or serpentine clay	T	U
Pseudobahia bahifolia	Hartweg's golden sunburst	Valley and foothill grasslands at the margins of blue oak woodland	E	P
Packera layneae	Layne's ragwort	Dry serpentine or granular igneous soils in chaparral and foothill pine/oak woodlands	T	P
Verbena californica	California vervain	Cismontane woodland, valley and foothill grassland, and foothill pine-blue oak woodland, often on serpentine	T	P

Sources: California Native Plant Society (CNPS) 2009; CDFG 2009; Reclamation 2007a; USFWS 2007b; Ayres 2005

The California Natural Diversity Database (CNDDB) (CDFG 2009) has no recorded occurrence of Ione manzanita, Chinese Camp brodiaea, or Hartweg's golden sunburst within the planning area (CDFG 2009). Further, Ione manzanita and Chinese Camp brodiaea were not found during surveys conducted in the planning area for these species (Evens et al. 2004; Reclamation 2007a). As such, these species are considered unlikely to occur in the planning area and are given no further consideration in this document.

Layne's ragwort. This species is federally listed as threatened and is listed as rare in California (CDFG 2009). It is a perennial herb with yellow flowers (CNPS 2009). Layne's ragwort has eight to thirteen ray flowers and fewer than 40 disk flowers that bloom April through July (Reclamation 1995, 2007a).

The species can be found on dry serpentine or granular igneous soils in chaparral and foothill pine/oak woodlands (Ayres 2005). It has been found in the Red Hills area, approximately 10 miles (16 kilometers) south of the lake area (BLM 2006), and a possible population was recorded in a drying stream margin in Peoria basin (Ayres 2005). The CNDDB does not have a recorded occurrence of this species within the project area (CDFG 2009).

California vervain. This species is federally listed as threatened and is found in Tuolumne County (CNPS 2009). It is a perennial or biennial herb, with violet to purple flowers that bloom May through September (CNPS 2009; Reclamation 1995).

The species is known from ten occurrences in the Red Hills and is threatened by grazing, mining, development, recreation, and vehicles (CNPS 2009). It is protected in part at Red Hills Area of Critical Environmental Concern (ACEC) on BLM land (CNPS 2009). California vervain may grow in cismontane woodland, valley and foothill grassland, and foothill pine-blue oak woodland (CDFG 2009; Ayres 2005). It has been found on mesic sites on Delpiedra serpentine, usually seeps, creeks, swales, or in wet meadows at 830 to 1,300 feet (250 to 400 meters) (CDFG 2009; BLM 2006; Ayres 2005). It is often associated with Cleveland's butterweed, which was observed on Peoria serpentine (Ayres 2005). The CNDDB does not have a recorded occurrence of this species within the project area; further, the species was not recorded during surveys conducted on PWMA serpentine (CDFG 2009; Reclamation 2007a). California vervain has been recorded at Yosemite Junction, approximately seven miles from the lake area (Reclamation 1995).

Federally Proposed or Designated Critical Habitat for Fish and Wildlife

Two threatened species have critical habitat designated within Calaveras or Tuolumne Counties, Central Valley steelhead (*Onchorhynchus mykiss*) and California tiger salamander (*Ambystoma californiense*), central population (USFWS 2009). The planning area is not within either of these designated areas (NMFS 1999; USFWS 2006).

Federally Proposed or Designated Critical Habitat for Plants

Within Tuolumne County there is designated critical habitat for four special status plant species: succulent owl's clover (*Castilleja campestris* ssp. *succulenta*), Hoover's spurge

(*Chamaesyce hooveri*), Colusa grass (*Neostapfia colusana*), and Greene's tuctoria (*Tuctoria greenei*) (USFWS 2009).

For all species, critical habitat was designated in FR 68:46683, on August 6, 2003. The designation was revised in FR 70:46923 on August 11, 2005, and species by unit designations were published in FR 71:7117 on February 10, 2006 (USFWS 2009). The critical habitat in Tuolumne County is present as a small band on the western edge of the county, outside of the planning area.

None of the four species have been recorded within the planning area, and Greene's tuctoria has not been recorded within either Calaveras or Tuolumne County. Due to a lack of recorded occurrences and distance to the designated critical habitat, these four species are considered unlikely to occur within the planning area.

All Other Special Status Wildlife

Twenty special status species (state endangered, state threatened, California species of special concern, state fully protected, and federal birds of conservation concern) have been documented in the planning area. These species are presented in Table 5-8.

The MBTA prohibits the take, harm, or trade of any migratory bird species and requires that all agencies must have a policy in place to prevent harm to such species as a result of that agency's actions. Birds protected by the MBTA include raptors, waterfowl, shorebirds, and neotropical migrants. Due to the large number of MBTA-protected bird species that could be found within the planning area, this section will not include a species-specific discussion of MBTA birds. All potentially occurring MBTA species are not listed in Table 5-8.

The USFWS prepared the Birds of Conservation Concern report (USFWS 2008) to help identify birds that, without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act. Birds identified in this report are given no additional legal protection, but are included in this RMP/EIS since they are species that could potentially be impacted by management actions.

Several invertebrates that are tracked by the CNDDB are included in Table 5-8. This is because, when New Melones Dam was constructed, many limestone caves were inundated, and species' habitats were lost. To mitigate these effects on the New Melones harvestman (*Banksula melones*), a type of rare spider, the USACE transplanted individuals of this species to other caves that would not be inundated. The invertebrates listed in Table 5-8 all potentially occur within caves in the planning area, and thus could be impacted by management actions.

Table 5-8: Special Status Wildlife Species* That Occur in or That May Be Affected by Projects in Calaveras and Tuolumne Counties

Scientific Name	Common Name	Preferred Habitat	Status SE= CA State Endangered ST = CA State Threatened DL = Federally delisted FP = Fully protect in CA BCC=Birds of Conservation Concern CSC = CA Species of Special Concern ** = Tracked by the CNDDB	Potential Occurrence in the Planning Area C = Confirmed P = Possible U = Unlikely
Invertebrates				
Aphrastochthonius grubbsi	Grubbs' Cave pseudoscorpion	Caves	**	P
Banksula melons	New Melones harvestman	Limestone caves with temperatures between 57 and 60 degrees F (14 and 16 degrees Celsius) and humidity between 82 and 97 percent. Found under rocks or wandering on floor or walls.	**	P
B. Tuolumne	Tuolumne cave harvestman	Caves	**	P
B. tutankhamen	King Tut Cave harvestman	Caves	**	P
Larca laceyi	Lacey's Cave pseudoscorpion	Caves	**	P
Pseudogarypus orpheus	Music Hall Cave pseudoscorpion	Caves	**	P
Stygobromus gradyi	Grady's Cave amphipod	Mostly found in caves, but one collection from a spring.	**	P
Fish				
Lavinia symmetricus ssp. 1	San Joaquin roach	Generally found in small, warm, intermittent streams. Most abundant in mid-elevation streams in the Sierra foothills and in the lower reaches of some coastal streams.	CSC	U
L. symmetricus ssp. 3	Red Hills roach	Small streams in areas with serpentine soil.	CSC	P

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Amphibians				
Ambystoma californiense	California tiger salamander, central population	Vernal pools and permanent waters in grasslands; burrows in adjacent upland sites.	CSC	U
Bufo canorus	Yosemite toad	Ponds used as breeding areas and nearby meadows that provide food.	CSC	U
Hydromantes platycephalus	Mount Lyell salamander	Caves, granite exposures, rock fissures, and seepages from springs and melting snow.	CSC	U
Rana aurora draytonii	California red-legged frog	Aquatic habitat (for breeding); a variety of habitat types, including riparian and upland areas.	CSC	P
Rana boylii	Foothill yellow-legged frog	Permanent water.	CSC	C
R. muscosa	Mountain yellow-legged frog	Rocky and shaded streams with cool waters above 4,500 feet (1,460 meters) elevation.	CSC	U
R. sierrae	Sierra Nevada yellow-legged frog	Rocky and shaded streams with cool waters at high elevation.	CSC	U
Scaphiopus hammondii (=*Spea hammondii*)	Western spadefoot	Grasslands; nests in temporary wetlands.	CSC	U

Table 5-8: Special Status Wildlife Species* That Occur in or That May Be Affected by Projects in Calaveras and Tuolumne Counties

Scientific Name	Common Name	Preferred Habitat	Status SE= CA State Endangered ST = CA State Threatened DL = Federally delisted FP = Fully protect in CA BCC=Birds of Conservation Concern CSC = CA Species of Special Concern ** = Tracked by the CNDDB	Potential Occurrence in the Planning Area C = Confirmed P = Possible U = Unlikely
Reptiles				
Emys (=*Clemmys*) *marmorata*	Western pond turtle	Permanent or near permanent water bodies with logs, vegetation, or mudflats for basking.	CSC	P
E. (=*Clemmys*) *marmorata marmorata*	Northwestern pond turtle	Permanent or near permanent water bodies with logs, vegetation, or mudflats for basking.	CSC	P
Phrynosoma coronatum (frontale population)	Coast (California) horned lizard	Lowlands along sandy washes with scattered low bushes.	CSC	P
Birds				
Accipiter gentilis	Northern goshawk	Woodlands with suitable prey source.	CSC	U
A. striatus	Sharp-shinned hawk	Woodlands with suitable prey source.	CSC	C
Agelaius tricolor	Tri-colored blackbird	Marsh vegetation or vegetation near small water bodies.	CSC, BCC	C
Aquila chrysaetos	Golden eagle	Cliffs or isolated trees.	CSC	C
Aphelocoma insularis	Island scrub-jay	Open oak woodland, brushland, and chaparral on Santa Cruz Island.	BCC	U
Athene cunicularia	Burrowing owl	Flat open grasslands.	CSC, BCC	C
Baeolophus inornatus	Oak titmouse	Oak and pine-oak woodlands, tall chaparral, and oak-riparian associations.	BCC	P
Bucephala islandica	Barrow's goldeneye	Open water bodies.	CSC	C
Buteo regalis	Ferruginous hawk	Open grasslands.	CSC	C

Table 5-8: Special Status Wildlife Species* That Occur in or That May Be Affected by Projects in Calaveras and Tuolumne Counties

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B. swainsoni	Swainson's hawk	Oak savannah; isolated trees or riparian areas.	ST	C
Calidris canutus population 1 (*roselaari* type)	Red knot	Sea coasts on tidal flats and beaches.	BCC	U
Calypte costae	Costa's hummingbird	Desert, semi-desert, arid, brushy foothills, and chaparral in southern California.	BCC	U
Campylorhynchus brunneicapillus	Cactus wren	Desert, mesquite, arid scrub, and coastal sage scrub in southern California.	BCC	U
Carduelis lawrencei	Lawrence's goldfinch	Oak woodland, chaparral, riparian woodland, and pinyon-juniper woodland.	BCC	P
Charadrius alexandrinus nivosus	Snowy plover	Beaches, dry mud or salt flats, and sandy shores of rivers, lakes, and ponds.	CSC, BCC	U
C. montanus	Mountain plover	Short-grass plains and fields, plowed fields, and sandy deserts.	CSC, BCC	U
Circus cyaneus	Northern harrier	Marshlands	CSC	C
Coccyzus americanus occidentalis	Western yellow-billed cuckoo	Deciduous riparian woodlands, especially dense stands of cottonwood and willow.	SE, BCC	P
Coturnicops noveboracensis	Yellow rail	Freshwater and brackish marshes and deep grass.	CSC, BCC	U
Cypseloides niger	Black swift	Cliffs near waterfalls.	CSC, BCC	U

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Dendroica petechia brewsteri	Yellow warbler	Riparian areas; chaparral.	CSC, BCC	C
Empidonax traillii	Willow flycatcher	Riparian areas; dense willows.	SE	U
Eremophila alpestris actia	California horned lark	Open grasslands or treeless areas.	CSC	C
Falco columbarius	Merlin	Open areas by woods.	CSC	C
F. mexicanus	Prairie falcon	Mountainous grasslands, open hills, plains, cliffs adjacent to open areas; prairies.	CSC, BCC	C
F. peregrinus anatum	American peregrine falcon	Forages over a variety of habitats with aerial prey; nests on cliffs or ledges.	DL, SE, FP, BCC	C
Gelochelidon nilotica	Gull-billed tern	Coastlines, salt marshes, rivers, and lakes in southern California.	CSC, BCC	U
Geothlypis trichas sinuosa	Saltmarsh common yellowthroat	Salt marsh and coastal areas of California.	CSC, BCC	U
Haematopus bachmani	Black oystercatcher	Pacific coastline.	BCC	U
Haliaeetus leucocephalus	Bald eagle	Large bodies of open water, such as lakes, marshes, coasts, and rivers. Also need tall trees for nesting and roosting. Three bald eagle nests were recorded in 2006 and 2007 at New Melones Lake. Also use the lake for foraging and roosting in the winter.	DL, SE, BCC	C

Table 5-8: Special Status Wildlife Species* That Occur in or That May Be Affected by Projects in Calaveras and Tuolumne Counties

Scientific Name	Common Name	Preferred Habitat	Status SE= CA State Endangered ST = CA State Threatened DL = Federally delisted FP = Fully protect in CA BCC=Birds of Conservation Concern CSC = CA Species of Special Concern ** = Tracked by the CNDDB	Potential Occurrence in the Planning Area C = Confirmed P = Possible U = Unlikely
Lanius ludovocianus	Northern loggerhead shrike	Open habitat with scattered perches.	CSC, BCC	C
Laterallus jamaicensis coturniculus	Black rail	Coastal and freshwater marshes.	ST, FP, BCC	U
Limnodromus griseus	Short-billed dowitcher	Salt water wetlands.	BCC	U
Limosa fedoa	Marbled godwit	Marshes and flooded plains.	BCC	U
Melanerpes lewis	Lewis's woodpecker	Open forest and woodland, riparian woodland, and ponderosa pine forest.	BCC	P
Melospiza melodia ssp. *graminea*	Channel Island song sparrow	Brushy, shrubby, and deep grassy areas along seacoasts and waterways on the Channel Islands.	CSC, BCC	U
M. melodia ssp. *maxillaris*	Suisun song sparrow	Brushy, shrubby, and deep grassy areas along seacoasts and waterways in the Suisun Bay area.	CSC, BCC	U
M. melodia ssp. *pusillula*	Alameda song sparrow	Brushy, shrubby, and deep grassy areas along seacoasts and waterways in the San Francisco Bay region.	CSC, BCC	U
M. melodia ssp. *samuelis*	San Pablo song sparrow	Brushy, shrubby, and deep grassy areas along seacoasts and waterways near San Pablo Bay.	CSC, BCC	U
Numenius americanus	Long-billed curlew	Beaches and mudflats.	BCC	U

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N. phaeopus	Whimbrel	Beaches, tidal mudflats, marshes, and flooded fields and pastures.	BCC	U
Oceanodroma homochroa	Ashy storm-petrel	Islands off the Pacific coastline.	CSC, BCC	U
Otus flammeolus	Flammulated owl	Wooded and open areas in lowlands and mountains.	BCC	P
Pandion haliaeetus	Osprey	Large water bodies.	CSC	C
Phalacrocorax auritus	Double-crested cormorant	Large water bodies.	CSC	C
Phoebastria nigripes	Black-footed albatross	Islands off the Pacific coastline.	BCC	U
Pica nuttalli	Yellow-billed magpie	Oak woodland interspersed with grasslands or cultivated fields; also open riparian woodland.	BCC	P
Picoides albolarvatus	White-headed woodpecker	Conifer woodland at high elevations.	BCC	U
P. nuttallii	Nuttall's woodpecker	Oak woodland, chaparral, and riparian woodland.	BCC	P
Pipilo maculatus clementae	San Clemente spotted towhee	Islands off the central California coast.	CSC, BCC	U
Ptychoramphus aleuticus	Cassin's auklet	Pacific coastline.	CSC, BCC	U
Puffinus creatopus	Pink-footed shearwater	Islands off the Pacific coastline.	BCC	U
P. opisthomelas	Black-vented shearwater	Islands off the Pacific coastline.	BCC	U
Riparia riparia	Bank swallow	Riparian areas; stream banks.	ST	C

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Rynchops niger	Black skimmer	Pacific coastline.	CSC, BCC	U
Selasphorus sasin	Allen's hummingbird	Chaparral, thickets and open coniferous woodlands in coastal and southern California.	BCC	U
Spizella atrogularis	Black-chinned sparrow	Chaparral, sagebrush, and arid scrub.	BCC	P
Strix nebulosa	Great gray owl	Old growth coniferous forests.	SE	U
S. occidentalis	Spotted owl	Dense forest and deep, wooded canyons.	CSC, BCC	U
Synthliboramphus hypoleucus	Xantus's murrelet	Islands off the Pacific coastline.	ST, BCC	U
Toxostoma lecontei	LeConte's thrasher	Sparsely vegetated desert flats and dunes in southeastern California.	CSC, BCC	U
Tyto alba	Barn owl	Open habitats, including grassland, chaparral, riparian, and wetlands.	**	C
Mammals				
Antrozous pallidus pacificus	Pallid bat	Grasslands, shrublands, woodlands; roosts in locations protected from general disturbance.	CSC	C
Aplodontia rufa californica	Sierra Nevada mountain beaver	Dense riparian areas.	CSC	U
Corynorhinus (=*Plecotus*) *townsendii*	Townsend's big-eared bat	Rocky areas with caves.	CSC	C
Euderma maculatum	Spotted bat	Roosts in caves, crevices, and cracks, and canyons.	CSC	U

Table 5-8: Special Status Wildlife Species* That Occur in or That May Be Affected by Projects in Calaveras and Tuolumne Counties

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Eumops perotis californicus	Western mastiff bat	Primarily roosts in high buildings and cliff faces, also trees.	CSC	C
Gulo gulo	California wolverine	High-elevation habitats; open terrain above timberline.	ST	U
Lasiurus blossevillii	Western red bat	Habitat edges and mosaics with trees that are protected from above and open below with open areas for foraging.	CSC	P
Lepus americanus tahoensis	Sierra Nevada snowshoe hare	Boreal zones, riparian communities with thickets of deciduous trees and shrubs.	CSC	U
Lepus townsendii	Western white-tailed jackrabbit	Open areas with scattered shrubs at high elevations.	CSC	U
Martes pennanti (pacifica) DPS	Pacific fisher	Mature and old growth forests; use large areas of primarily coniferous forests with fairly dense canopies and large trees, snags, and down logs.	CSC	U
Sorex lyelli	Mount Lyell shrew	High elevation riparian areas in the southern Sierra Nevada.	CSC	U
Taxidea taxus	American badger	Dry open grasslands, fields, and pastures.	CSC	U

Table 5-8: Special Status Wildlife Species* That Occur in or That May Be Affected by Projects in Calaveras and Tuolumne Counties

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Vulpes vulpes necator	Sierra Nevada red fox	Forest openings, meadows, and barren rocky areas associated with its high elevation habitats.	ST	U

Notes: *Special Status species in this table include state-listed threatened and endangered species and California special concern species, USFWS Birds of Conservation Concern (USFWS 2008), species that are tracked by the CNDDB (CDFG 2009) for Tuolumne or Calaveras County, or those otherwise documented in the planning area. Tracked species are those that do not have special legal protection, but are tracked by the CNDDB due to their rarity, restricted distribution, or threats to the species' survival.

Sources: CDFG 2009; USFWS 2006a.

Other Special Status Plant Species

A list of other special status plant species that may occur within the planning area was compiled from USFWS, CNDDB, and CNPS lists for Tuolumne and Calaveras Counties and is presented in Table 5-9 (CDFG 2009; CNPS 2009).

Table 5-9: Special Status Plant Species* That Occur in or That May Be Affected by Projects in Calaveras and Tuolumne Counties

Scientific Name	Common Name	Preferred Habitat	Status SE= CA State Endangered ST = CA State Threatened Rare = CA State Rare 1A = Presumed extinct in CA 1B = Rare, threatened, or endangered in CA and elsewhere 0.1 = Seriously endangered in CA 0.2 = Fairly endangered in CA 0.3 = Not very endangered in CA	Potential Occurrence in the Planning Area C = Confirmed P = Possible U = Unlikely
Allium jepsonii	Jepson's onion	Serpentine soils in open areas.	1B.2	P
A. tribracteatum	Three-bracted onion	Chaparral and coniferous forest above 3,300 feet (1,000 meters) elevation.	1B.2	U
A. tuolumnense	Rawhide Hill onion	Serpentine soil in foothill pine chaparral.	1B.2	P
A. yosemitense	Yosemite onion	Chaparral, woodland, and coniferous forest above 1,650 feet (500 meters) elevation.	Rare 1B.3	U
Arctostaphylos myrtifolia	Ione manzanita	Chaparral or oak-dominated, open-canopied woodlands.	1B.2	U
A. nissenana	Nissenan manzanita	Coniferous forest and chaparral.	1B.2	P
Brodiaea pallida	Chinese Camp brodiaea	Valley and foothill grassland, vernal swales, or serpentine clay.	SE 1B.1	U
Calochortus clavatus var. *avius*	Pleasant Valley mariposa lily	Coniferous forest.	1B.2	U
Calycadenia hooveri	Hoover's calycadenia	On exposed, rocky, barren soil in cismontane woodland and valley and foothill grasslands.	1B.3	P
Chlorogalum grandiflorum	Red Hills soaproot	Coniferous forest, woodlands, and chaparral.	1B.2	C
Clarkia australis	Small's southern clarkia	High elevation woodlands and coniferous forest.	1B.2	U

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Scientific Name	Common Name	Preferred Habitat	Status SE= CA State Endangered ST = CA State Threatened Rare = CA State Rare 1A = Presumed extinct in CA 1B = Rare, threatened, or endangered in CA and elsewhere 0.1 = Seriously endangered in CA 0.2 = Fairly endangered in CA 0.3 = Not very endangered in CA	Potential Occurrence in the Planning Area C = Confirmed P = Possible U = Unlikely
C. rostrata	Beaked clarkia	Woodlands and valley and foothill grassland.	1B.3	P
Cryptantha crymophila	Subalpine cryptantha	Subalpine coniferous forest	1B.3	U
C. mariposae	Mariposa cryptantha	Serpentine outcrops in chaparral.	1B.3	P
Draba asterophora var. *asterophora*	Tahoe draba	Subalpine coniferous forest.	1B.3	U
Epilobium howellii	Subalpine fireweed	Subalpine coniferous forest and meadows.	1B.3	U
Eriogonum luteolum var. *saltuarium*	Jack's wild buckwheat	Coniferous forest at high elevations.	1B.2	U
Eriophyllum nubigenum	Yosemite woolly sunflower	High elevation coniferous forest and chaparral.	1B.3	U
Eryngium pinnatisectum	Tuolumne button-celery	Vernal pools, woodlands, and coniferous forest.	1B.2	P
E. racemosum	Delta button-celery	Seasonally inundated riparian scrub with clay depressions.	SE 1B.1	P
E. spinosepalum	Spiny-sepaled button-celery	Vernal pools and valley and foothill grassland.	1B.2	P
Erythronium taylorii	Pilot Ridge fawn lily	Coniferous forest at high elevations	1B.2	U
E. tuolumnense	Tuolumne fawn lily	Coniferous forest, woodlands, and chaparral above 1,650 feet (500 meters) elevation.	1B.2	U
Horkelia parryi	Parry's horkelia	Openings in chaparral or woodlands.	1B.2	P

Table 5-9: Special Status Plant Species* That Occur in or That May Be Affected by Projects in Calaveras and Tuolumne Counties

Scientific Name	Common Name	Preferred Habitat	Status SE= CA State Endangered ST = CA State Threatened Rare = CA State Rare 1A = Presumed extinct in CA 1B = Rare, threatened, or endangered in CA and elsewhere 0.1 = Seriously endangered in CA 0.2 = Fairly endangered in CA 0.3 = Not very endangered in CA	Potential Occurrence in the Planning Area C = Confirmed P = Possible U = Unlikely
Hulsea brevifolia	Short-leaved hulsea	High elevation coniferous forest.	1B.2	U
Iris hartwegii ssp. *columbiana*	Tuolumne iris	Woodland and coniferous forest above 1,300 feet (400 meters) elevation.	1B.2	U
Juncus leiospermus var. *aharti*	Ahart's dwarf rush	Mesic valley and foothill grassland.	1B.2	U
Lomatium congdonii	Congdon's lomatium	Serpentine soils with serpentine chaparral plants and foothill pines.	1B.2	C
L. stebbinsii	Stebbin's lomatium	Openings in yellow pine forest at high elevation.	1B.1	U
Lupinus gracilentus	Slender lupine	Subalpine coniferous forest.	1B.3	U
L. spectabilis	Shaggyhair lupine	Serpentine chaparral and cismontane woodland.	1B.2	P
Mimulus filicaulis	Slender-stemmed monkeyflower	Coniferous forest and woodlands above 3,000 feet (900 meters) elevation.	1B.2	U
M. pulchellus	Yellow-lip pansy monkeyflower	Moist meadows and coniferous forest.	1B.2	P
M. whipplei	Whipple's monkeyflower	Yellow pine forest above 2,000 feet (600 meters) elevation.	1A	U
Navarretia myersii ssp. *myersii*	Pincushion navarretia	Vernal pools and valley and foothill grassland.	1B.1	P
Packera layneae	Layne's ragwort	Dry serpentine or granular igneous soils in chaparral and foothill pine/oak woodlands.	Rare 1B.2	P

Table 5-9: Special Status Plant Species* That Occur in or That May Be Affected by Projects in Calaveras and Tuolumne Counties

Scientific Name	Common Name	Preferred Habitat	Status SE= CA State Endangered ST = CA State Threatened Rare = CA State Rare 1A = Presumed extinct in CA 1B = Rare, threatened, or endangered in CA and elsewhere 0.1 = Seriously endangered in CA 0.2 = Fairly endangered in CA 0.3 = Not very endangered in CA	Potential Occurrence in the Planning Area C = Confirmed P = Possible U = Unlikely
Pseudobahia bahifolia	Hartweg's golden sunburst	Valley and foothill grasslands at the margins of blue oak woodland.	SE 1B.1	P
Senecio clevelandii var. *heterophyllus*	Red Hills ragwort	Serpentine seeps in cismontane woodland.	1B.2	P
Streptanthus oliganthus	Masonic Mountain jewelflower	Pinyon-juniper woodland at high elevations.	1B.2	U
Verbena californica	California vervain	Cismontane woodland, valley and foothill grassland, and foothill pine-blue oak woodland.	ST 1B.1	P

Notes: *Special Status species in this table include state-listed threatened, endangered, and rare species and CNPS 1A or 1B list species for Tuolumne or Calaveras County.

The PWMA has documented occurrences of special status plant species. Other planning areas may have suitable habitat for several special status species but have not been surveyed. In addition, special status plants have been documented on lands near, but not within, the planning area. These species may occur within the planning area, particularly in areas that have not been surveyed.

Table Mountain. On Table Mountain, *Allium jepsonii* occurs near Rawhide Flat (Reclamation 1995). In addition, *Eryngium spinosepalum* is found in vernal pools of the Sierra Nevada foothills and may occur on Table Mountain (Reclamation 1995).

Peoria Wildlife Management Area. In the Peoria Wildlife Area Management Area, several occurrences of *Lupinus spectabilis* and one occurrence of *Packera clevelandii* and *Monardella douglasii* ssp. *venosa* have been documented (Ayres 2005; Vasquez 2007). Populations of *Allium tuolumnense* and *A. jepsonii* have been identified in the lower Peoria basin (Ayres 2005; Vasquez 2007), and this species also occurs on Rawhide Hill and in the BLM Red Hills Management Area adjacent to the planning area (Reclamation

1995). *Chlorogalum grandiflorum* is endemic only to the Red Hills of Tuolumne County, as well as El Dorado and Placer Counties, south of the planning area (Reclamation 1995). Potential populations of this species have been found in the Peoria basin (Ayres 2005; Evens et al. 2004). The species was found adjacent to the PWMA access road (Reclamation 2007a). *Lomatium congdonii* can be found in the Red Hills Management Area (Reclamation 1995) and has been recorded throughout the Peoria basin (Ayres 2005; Evens et al. 2004).

5.2.11 General Land Management

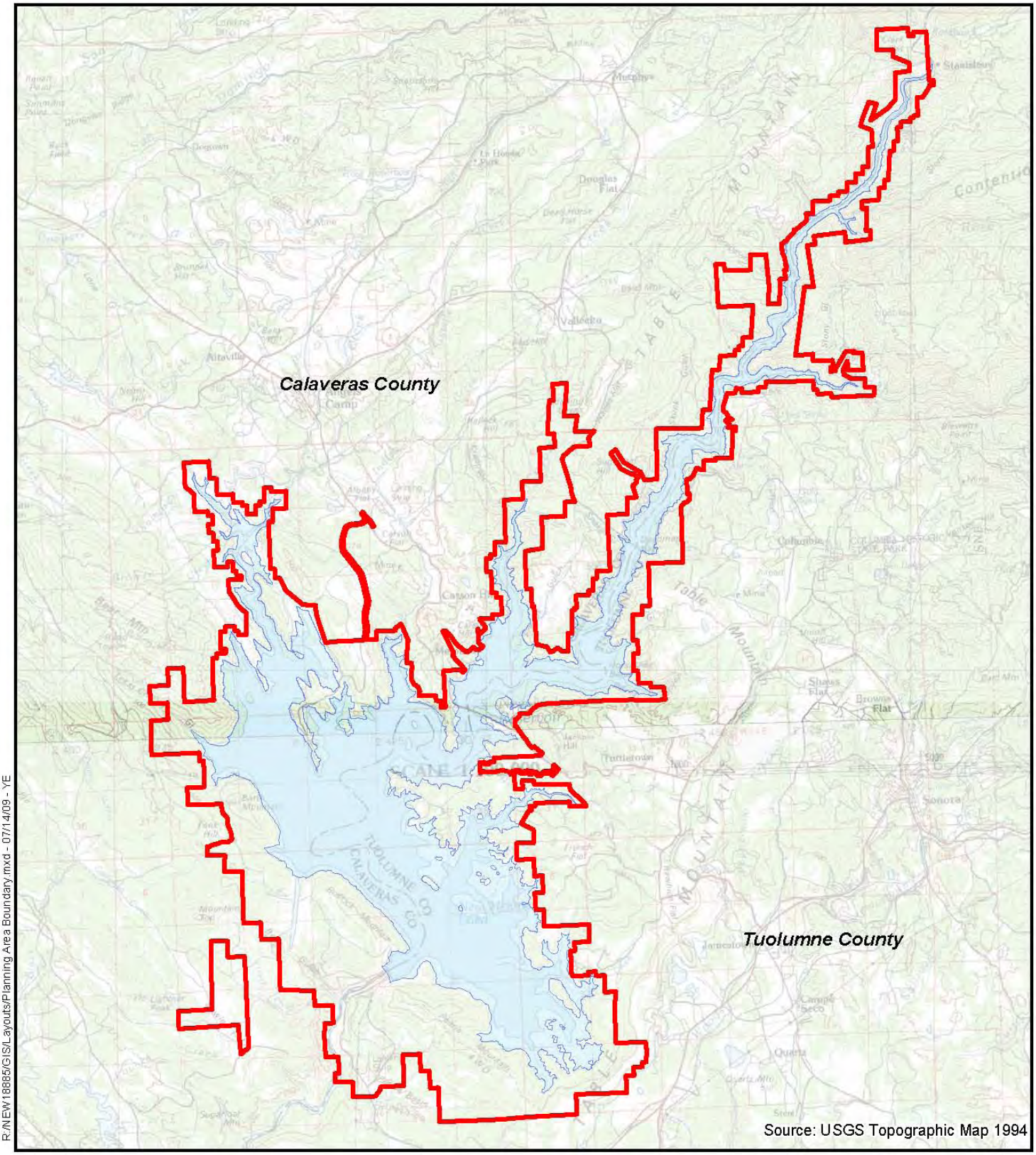
General Land Use

Reclamation administers approximately 15,168 acres (6,140 hectares) of land above the gross pool reservoir level (1,088 feet [330 meters] above mean sea level) surrounding the New Melones Lake Area (Figure 5-6). Approximately 5,405 acres (2,190 hectares) of the surrounding lands are designated for recreation and wildlife purposes, and 4,065 acres (1,650 hectares) are held as operations or open space lands.

Included in the 5,405 acres (2,190 hectares) of land designated for recreation and wildlife purposes, 2,520 acres (1,020 hectares) encompass the PWMA. The USACE acquired the PWMA to partially mitigate for loss of approximately 10,000 acres (4,050 hectares) of fish and wildlife habitat associated with expanding New Melones Lake.

Within Reclamation resource area lands, both Reclamation and adjacent landowners manage easements. Pacific Gas and Electric (PG&E) maintains a transmission line easement along the southwestern edge of the Reclamation boundary at the base of Table Mountain. Also, PG&E operates and has an easement for an afterbay dam that is related to the Stanislaus Powerhouse near Camp Nine. Also in the Camp Nine Management Area, Northern California Power Agency and Calaveras County Water District jointly operate the Collierville Powerhouse, which is also partially located on Reclamation lands near Clarks Flat. Tuolumne County Irrigation District (TCID) also maintains a permanent easement for a water intake structure, pumping plant, switchyard, 100,000-gallon (380,000-liter) storage tank, 16-inch (40-centimeter) pipeline, and roadway access to the pump station. The TCID easement is off of Old Abbeys Ferry Road, approximately two miles north of Parrotts Ferry Bridge.

Adjacent Land Management and Uses. Lands adjacent to the project boundary are mostly undeveloped and are used primarily for grazing and for open space values. The largest adjacent landowners are the BLM and USFS (Figure 5-7). Adjacent BLM lands are managed primarily for watershed protection and for preserving and improving forage and wildlife habitat. Six grazing allotments and twenty-two mining claims are held on BLM lands that adjoin Reclamation lands. The grazing allotments are categorized as custodial allotments with a year-round season of use. Of the 22 mining claims adjacent to the New Melones Lake Area, only one is actively mined near French Flat on the southeastern side of New Melones Lake.



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Planning Area Boundary

New Melones Lake Area, California
Central California Area Office

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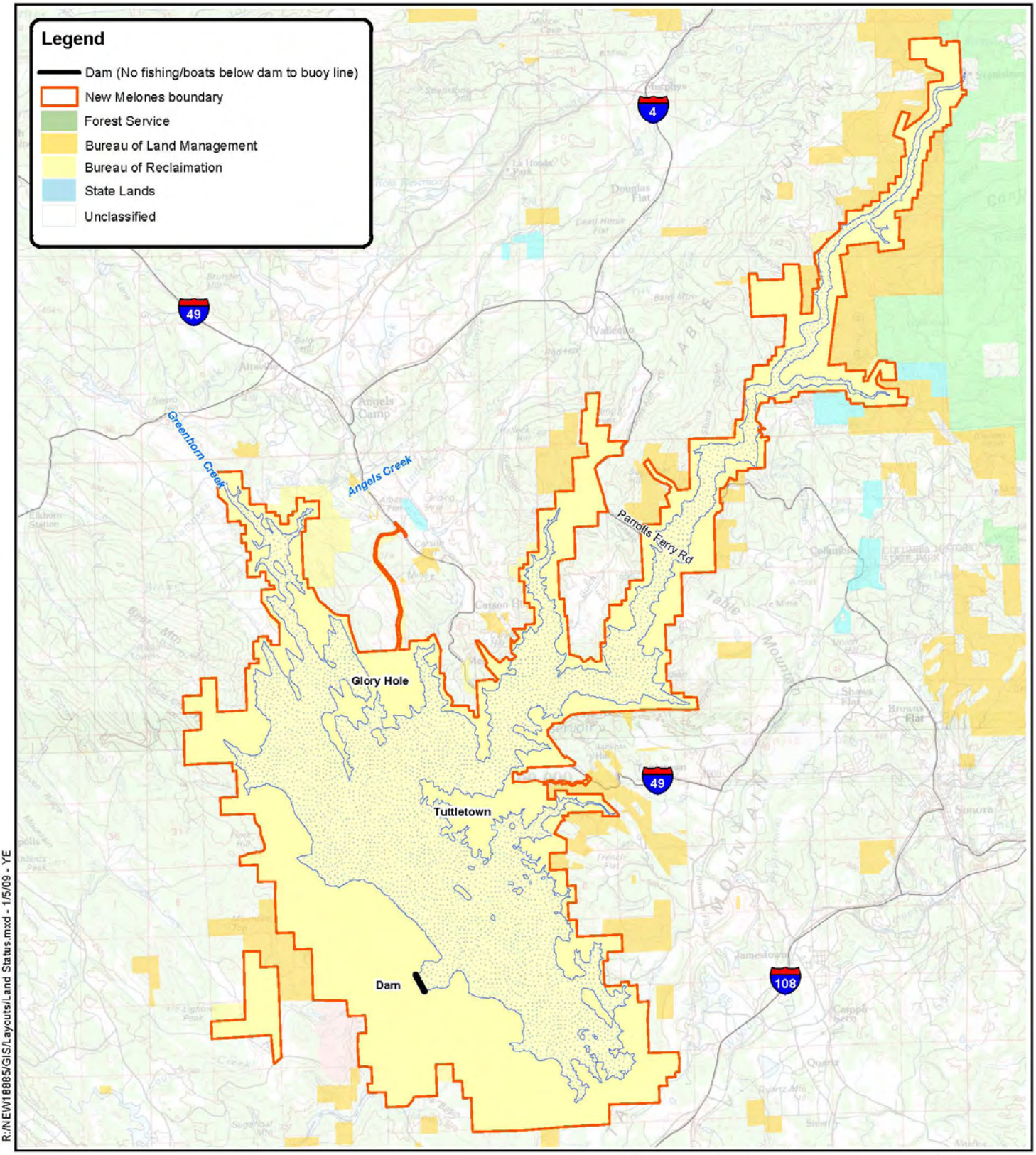
Figure 5-6



New Melones Land Status

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New Melones Lake Area, California
Central California Area Office

Figure 5-7

The Stanislaus National Forest adjoins Reclamation lands at Clarks Flat and near the South Fork area of the New Melones Lake Area. The USFS has one grazing allotment adjacent to Reclamation lands in Clarks Flat. The 480-acre (190 hectare) allotment has a season of use from May 1 through September 15.

Residential development continues to encroach on Reclamation lands as population in the area increases, causing increased trespass and land management issues. Rural residential development has expanded around existing clusters, such as areas along Jackass Hill and French Flat Road.

Trespass

Certain activities are prohibited on federal land without a special use permit. These activities include grazing or watering livestock, trespass into areas specified as off limits to public access (e.g., operations facilities and areas with sensitive ecological or cultural resources), using motorized vehicles in any areas other than on paved or specified roads, and constructing, placing, or maintaining any kind of road, trail, structure, fence, enclosure, communication equipment, pump, well, or other improvements.

Trespassing, vandalism, illegal dumping, and illegal mining and mineral extraction are common problems within the New Melones Lake Area, especially in areas that are difficult to access or patrol. Adjacent grazing livestock often access Reclamation lands through poorly maintained fencing or areas where fencing has been taken out illegally.

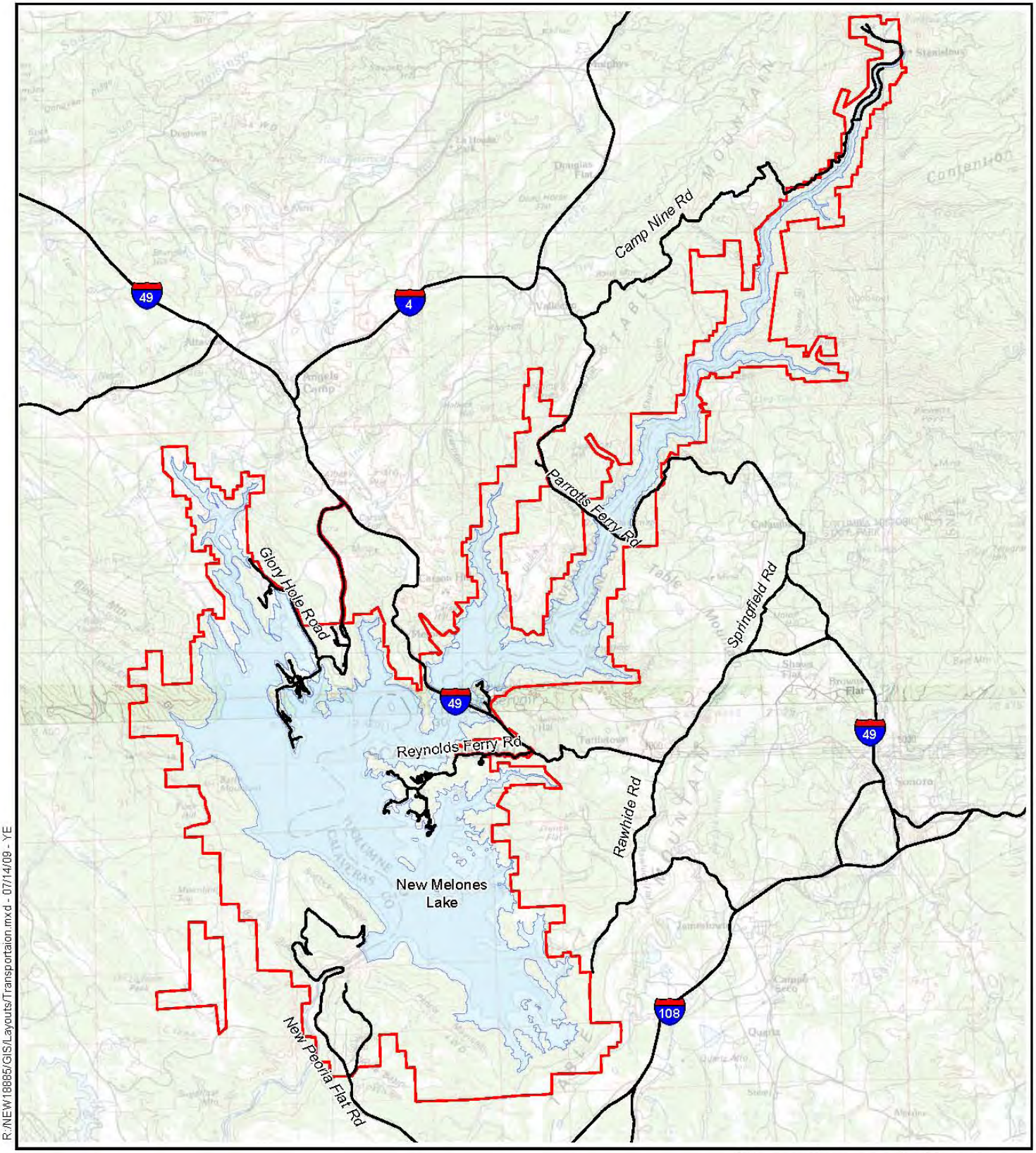
Several areas within the New Melones Lake Area have been closed as critical to infrastructure or due to public health and safety concerns. These closures are presented in the Current Closures Memorandum in Appendix E.

Reclamation will continue to enforce policies related to trespass onto or the unauthorized use of the land and water under its jurisdiction. Trespass and unauthorized use, when permitted to continue, deprive the public of its rightful use and enjoyment of the public lands. It is the general policy of Reclamation to facilitate and ensure the proper use of land resources. Benefits to the public as a whole resulting from nonexclusive uses of federal lands is the primary management emphasis.

5.2.12 Access and Transportation

Road Access. The road system serving the project area consists of the state highways, county roads, and private roads, as seen in Figure 5-8.

State Route (SR) 49. SR 49 provides access to the recreational areas of the New Melones Lake Area from Angels Camp in the north and Sonora in the south. Both commuters and tourists use the highway, as it is the primary access roadway between Tuolumne County and Calaveras County. The highway links communities in the Sierra foothills and acts as "Main Street" for the City of Angels (Angels Camp). SR 49 meets with SR 4 at the north end of Angels Camp. Both state routes are owned and maintained by Caltrans.



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Roads and Access

New Melones Lake Area, California
Central California Area Office

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Miles

Figure 5-8

Annual Average Daily Traffic (AADT) volume is defined as the total two-way traffic volume on a roadway over the year divided by 365 days. Caltrans traffic counts reflect an estimate of AADT by compensating for seasonal fluctuation, weekly variation, and other variables. Recording AADT is necessary for presenting a comprehensive picture of traffic flow, evaluating traffic trends, computing accident rates, and planning and designing highways. Roads surrounding the New Melones Lake Area include SR 49, Highway 108/120, O'Byrnes Ferry Road, Glory Hole Road, Rawhide Road, Tuttletown Road, Springfield Road, Parrotts Ferry Road, Camp Nine Road, New Peoria Flat Road, and Peoria Flat Road. The highest AADT volume in Calaveras County in 2006 was 17,200, observed on SR 49 in Angels Camp on Murphy's Grade Road. The highest AADT volume in Tuolumne County in 2006 was 25,500 on SR 49 in Sonora at the East Junction of SR 108 (Caltrans 2008). AADT data for 2004, 2005, and 2006 are presented in Table 5-10 for SR 49, Table 5-11 for SR 4, Table 5-12 for SR 108, and Table 5-13 for SR 120.

Whittle Ranch Road turnoff to Glory Hole Recreation Area. Reclamation owns and maintains Whittle Ranch Road, which consists of two lanes and is in good condition. Circulation and roadways within the campground areas are generally well positioned and adequately signed and maintained. Access to the marina from Whittle Ranch Road is well marked, but the road leading down to the marina is somewhat hazardous due to its steep incline and composition of loose gravel material at lower lake levels. Access to the boat ramps is generally good.

Table 5-10: Annual Average Daily Traffic SR 49

SR 49	2004	2005	2006
Calaveras County			
Angels Camp, south junction Route 4, North	15,600	15,900	16,100
Angels Camp, Murphys Grade Road, south	16,700	17,000	17,200
Angels Camp, north junction Route 4, south	11,900	12,100	12,200
Tuolumne/Calaveras County Line	5,900	6,000	6,100
Tuolumne County			
Tuttletown, north	5,600	5,700	5,800
Rawhide Road, south	5,800	5,900	6,000
Sonora, Washington Street/Shaws Flat Road, north	16,200	16,500	16,700

Source: Caltrans 2008

Table 5-11: Calaveras County Annual Average Daily Traffic SR 4

SR 4	2004	2005	2006
O'Byrnes Ferry Road, west	5,100	5,200	5,200
Angels Camp, east junction, Rt. 49 East	6,800	6,900	7,000
Rolleri Bypass Road, south	6,500	6,600	6,700

Source: Caltrans 2008

Table 5-12: Tuolumne County Annual Average Daily Traffic SR 108

SR 108	2004	2005	2006
East Jct. Rte. 120, Yosemite junction	12,500	13,000	13,200
West Jct. Rte. 49, Montezuma Rd.	12,500	13,000	13,200
East jct. Rte 49, Sonora jct.	18,500	19,500	19,600

Source: Caltrans 2008

Table 5-13: Calaveras County Annual Average Daily Traffic SR 120

SR 120	2004	2005	2006
Keystone, La Grange Road	13,000	15,200	15,200
East jct. Rte. 108, Yosemite jct.	15,000	3,600	3,200
Chinese Camp, north jct. Rte 49, Montezuma Road	17,000	3,600	3,200

Source: Caltrans 2008

Reclamation lands and facilities are accessible from SR 49 at the locations described below.

Reynolds Ferry Road turnoff to Tuttletown Recreation Area. Reclamation owns and maintains Reynolds Ferry Road at about a mile from SR 49 to its terminus. This road is in excellent condition. Boat ramp access is generally good at the Tuttletown Recreation Area.

Minor paved road to Reclamation Headquarters and Mark Twain Unimproved Day Use Recreation Area. The two-lane paved road from SR 49 to the lake access/recreation area is the former SR 49, now called Melones Court, and is owned and maintained by Reclamation. It is in good condition to the park administration office and visitor center gate but deteriorates from the gate to the lake access/unimproved recreation area. In 2008, vehicle access has been limited to within 100 to 200 feet (30 to 60 meters) of the water's edge, and trailered boat launching is no longer permitted due to deteriorated road conditions and user conflicts in this narrow lake access corridor. The park administration office and visitor center are accessed by turning right from Melones Court onto

Studhorse Flat Road. The lands and facilities are approximately a quarter mile from the intersection on well-maintained roads.

Minor paved road to Old Town (Melones) Unimproved Day use Recreation Area. The two-lane paved road from SR 49 to the recreation area is gated approximately 0.1 mile (160 meters) from the SR 49 junction. However, there is nonmotorized public access to Old Town (Melones) Unimproved Day Use Recreation Area.

Rawhide Road (Tuolumne County Road E5) turnoff to Shell Road to Table Mountain and PWMA. Rawhide Road is a well-maintained, paved, two-lane county road that is accessible from two points along SR 49. Shell Road, a county road for the first 2.59 miles (4.2 kilometers) from its intersection at Rawhide Road, starts as a well-maintained two-lane then one-lane paved road. At the 1.6 mile (2.5 kilometer) mark, the pavement ends and the road becomes a poorly maintained, two-track dirt road through private property and across a county road easement. It is used for public vehicles, emergency vehicles, and Reclamation staff and contractors to access Reclamation's Table Mountain Trailhead staging area of the PWMA. After the 2.59 mile (4.2 kilometer) point, the road crosses onto Reclamation property, where it is gated to prevent public vehicle access. The road continues through the PWMA as a service road for authorized vehicles only. This road is open to public equestrian use, hiking, biking, and hunting. PWMA is closed to public vehicles, a change called for in the PWMA EA (Reclamation 2007a). Another way to access Bear Creek Management Area, an unimproved recreation area, would be to travel to the PWMA, as described, then to travel north and west of the public parking along Shell Road. No vehicle access into the Bear Creek Management Area is permitted.

Rawhide Road (Tuolumne County Road E5) turnoff to French Flat Road to French Flat Unimproved Day Use Recreation Area. Rawhide Road is a well-maintained, paved, two-lane county road that is accessible from two points along SR 49. French Flat Road, a county road, is a well-maintained two-lane paved road, which at two miles (3.2 kilometers) enters gated BLM land. This half-mile-long, unpaved road crosses BLM land, and connects with Reclamation property. No public vehicles are permitted on Reclamation property in French Flat.

Rawhide Road (Tuolumne County Road E5) turnoff to Old Melones Road to Bear Creek Unimproved Day Use Recreation Area. Rawhide Road is a well-maintained, paved, two-lane county road that is accessible from two points along SR 49. Old Melones Dam Road, a county road, is a well-maintained, two-lane paved road, which at approximately half a mile, is gated to restrict nonmotorized vehicle access to Bear Creek Recreation Area.

Parrotts Ferry Road. Reclamation lands and facilities are accessible from Parrotts Ferry Road at the locations described below.

The two-lane paved road from Parrotts Ferry Road to the recreation area is gated approximately 0.1 mile (160 meters) from the Parrotts Ferry Road junction. However, motorized vehicles are not allowed into the Old Parrotts Ferry Unimproved Day Use Recreation Area and New Melones Lake.

Camp Nine Unimproved Day Use Recreation Area. Approximately three miles of Camp Nine Road is on land owned by Reclamation, which also owns this portion of the road. However, this portion is maintained via a road maintenance agreement with the Collierville Power Plant, which the Calaveras County Water District owns and the Northern California Power Authority (NCPA) operates under a Federal Energy Regulatory Commission (FERC) licensing agreement. The remainder of Camp Nine Road is privately owned by 22 landowners, with easements to PG&E and NCPA. In exchange for access rights, the power companies are responsible for maintaining the road. Reclamation's access rights across the privately owned portion of Camp Nine Road are based on prescriptive easement. PG&E's Stanislaus Power Plant is across the New Camp Nine Bridge and at the end of the road, along the Tuolumne County side of the river. This road is on Reclamation property until it reaches land owned by PG&E for the power plant. PG&E has easement rights to access the power plant across Reclamation land, and Reclamation has easement rights to access across PG&E land. The road is in fair to poor condition, with numerous potholes, eroded shoulders, and deteriorated guardrails. It has two lanes, which in some places, have deteriorated to one lane. PG&E operates the power plant under a FERC licensing agreement.

Coyote Creek Nature Trail and Natural Bridges. Reclamation owns and maintains the paved two-lane turnoff and dead end public road from Parrotts Ferry Road to the trailhead. The road is in fair condition. Designated parking stalls are not available, and the Natural Bridges area has limited parking.

Peoria Flat Road. Reclamation lands and facilities are accessible from SR 108/ SR120 at the locations described below.

Minor paved road to Peoria Equestrian Staging Area to Peoria Wildlife Area. From SR108/SR120 to get to the Peoria Equestrian Staging Area, one turns west onto county road E15/O'Byrne's Ferry Road for approximately .2 mile (320 meters) and then turns north onto New Peoria Flat Road for approximately three miles (five kilometers), until the Baseline Conservation Camp entrance. At this point, a public parking lot is available to the right, approximately .2 mile (320 meters) down an access road. The parking lot provides access for nonmotorized vehicles to the PWMA and the radio-controlled flyers facility.

Minor paved road to Dam Overlook. From SR108/SR 120 to get to the Overlook, one turns west onto county road E15/O'Byrne's Ferry Road for approximately 0.2 mile (320 meters) and then turns north onto New Melones Dam Road/New Peoria Flat Road for approximately three miles. From this point, public motorized vehicle access to the Overlook is restricted, but nonmotorized access to the Overlook is possible by following the paved former Overlook access road on foot.

Lake Only Access. Public access to the Dam and Spillway Management Area, Westside Management Area, and Bowie Flat Management Area is only via New Melones Lake.

Boat and Personal Watercraft Use. Motorized boats are the principal means to access and enjoy many of the recreation opportunities at the New Melones Lake Area. However,

kayaks, canoes, and sailboats are also used to access the lake. Boat launch ramps with courtesy docks are located in the Glory Hole and Tuttletown Recreation Areas.

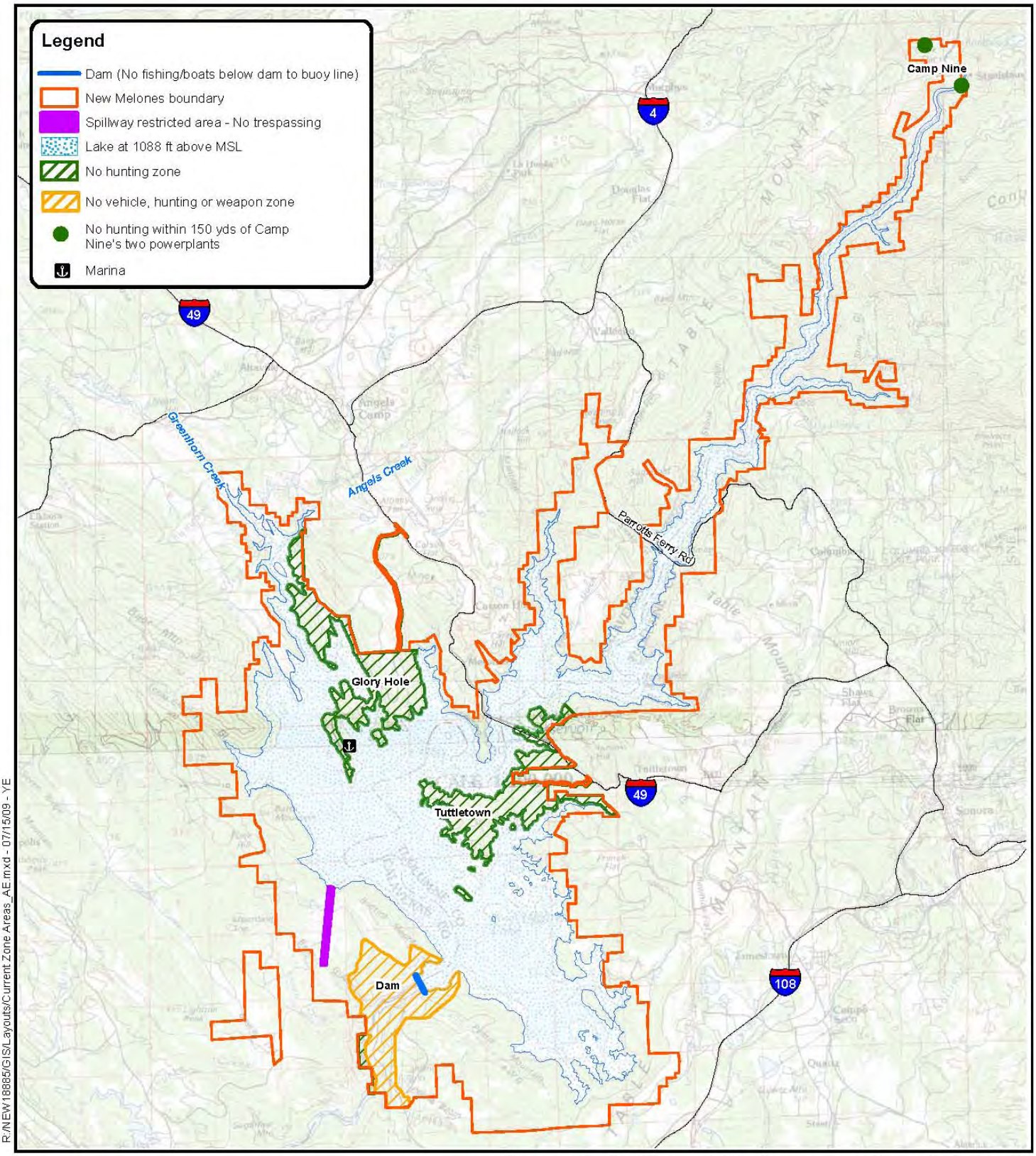
Projected increases in population will result in increased demand on roads within the project area; use of the New Melones Lake Area is expected to increase 20 percent over the planning period. The increase in travel demand on the roadway system will require increased costs for roadway maintenance and rehabilitation. Because the roadways and facilities were not designed to carry large amounts of traffic, roadway improvements will be required to keep up with this growth. Reclamation is working with county planning departments to ensure proposed development projects have legal access across Reclamation land before approving the projects.

5.2.13 Public Health and Safety

Reclamation provides that staff levels be commensurate with recreation visitation. This is to fully implement policies and management actions and to maintain the level and quality of safety and services expected by visitors to the New Melones Lake Area. All Reclamation employees take safety training to identify public safety hazards. Reclamation's employees provide interpretive programs and public contact to educate the public about safety issues relating to boating, firearms use, fire use, and natural hazards, such as poisonous snakes. There is also a visitor center to inform and educate the public about safety matters at the New Melones Lake Area. Additionally, campground hosts provide information to campers and report public safety issues to Reclamation staff (Laird 2007); campground hosts monitor the campgrounds three times a day.

Recreation. There are a number of recreation zones for regulating the type of and intensity of use to protect sensitive resources and maintain public safety (Reclamation 1995). The various zones include the following (Figures 5-9, 5-10, and 5-11):

- No Hunting Zones—
    - It is unlawful for any person, other than the owner, person in possession of the premises, or a person having the express permission of the owner or person in possession of the premises, to hunt or to discharge while hunting, any firearm or other deadly weapon within 150 yards (135 meters) of any occupied dwelling house, residence, or other building or any barn or other outbuilding used in connection therewith. The 150-yard (135-meter) area is a "safety zone";
    - It is unlawful for any person to intentionally discharge any firearm or release any arrow or crossbow bolt over or across any public road or way open to the public, in an unsafe manner (Fish and Game Code 3004);
- No hunting is permitted within 150 yards (135 meters) of other recreational uses;
- No hunting or weapons allowed within the restricted dam-spillway zone (Figure 5-10);



No hunting within 150 yds of any developed recreation area, campgrounds, or other facilities, boat ramp parking area, day use area, neighboring residences, or within 150 yds of Camp Nine's two power plants

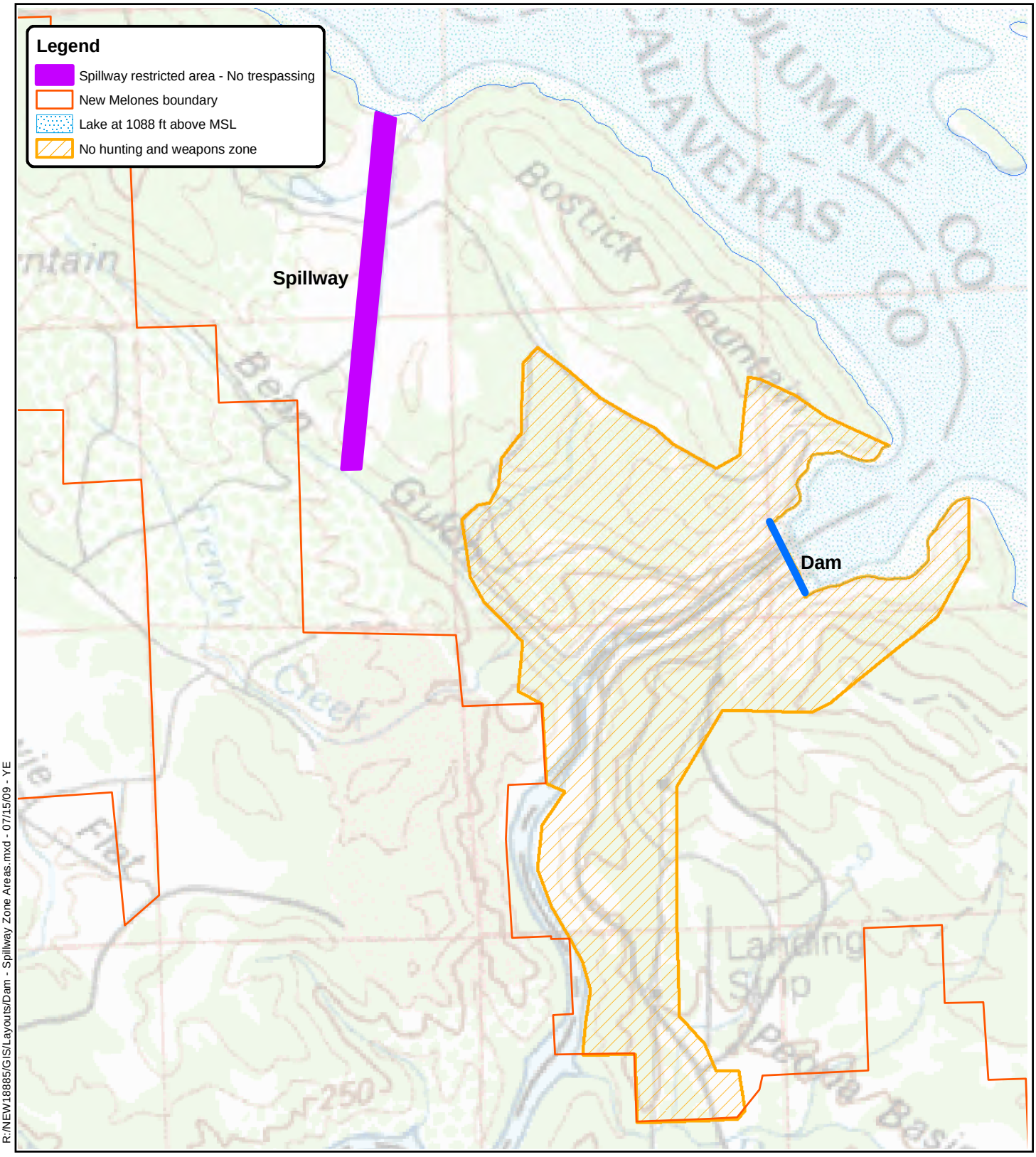
Dam zone - No vehicles, hunting or weapons

Current New Melones Restricted Land Use Zones

New Melones Lake Area, California
Central California Area Office

0 2
Miles

Figure 5-9



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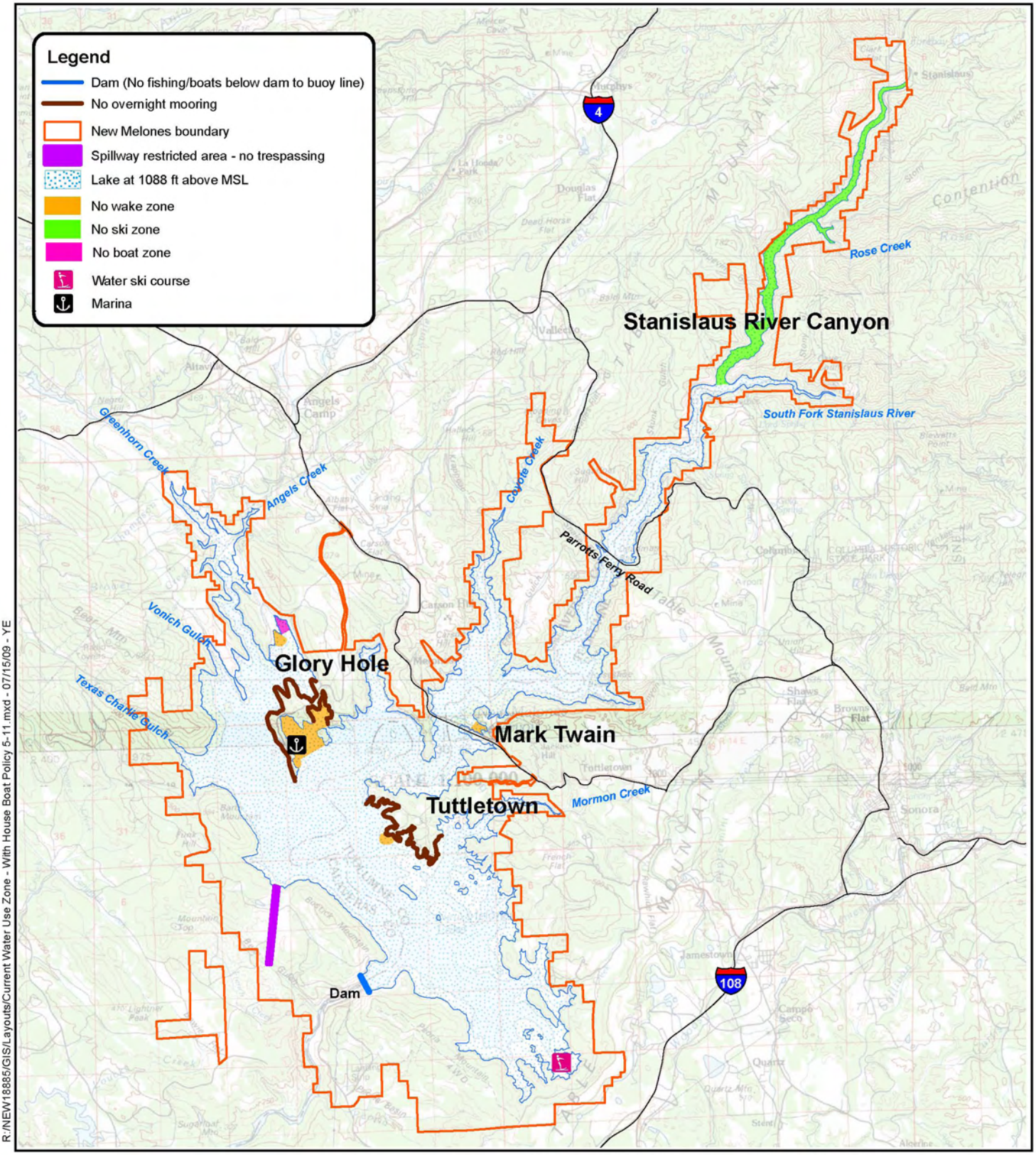
No hunting within 150 yds of any developed recreation area, campgrounds, or other facilities, boat ramp parking area, day use area, neighboring residences, or within 150 yds of Camp Nine's two power plants

Dam zone - No hunting and weapons zone

Current New Melones Restricted Land Use - Dam - Spillway Zone

New Melones Lake Area, California
Central California Area Office

Figure 5-10



No wake zone - 200 ft around marina, boat launches, and lake access

No ski zone - Areas where it has been determined that, due to the nature of the area, it is too dangerous to tow a person behind a vessel. No waterskiing, tubing, wakeboarding or kneeboarding is permitted.

No boat zone - No boats within designated area

Marina - No swimming within marina area

0 2

Miles

New Melones Water Use Zones
No Action Alternative

New Melones Lake Area, California
Central California Area Office

Figure 5-11

- No hunting is permitted within the boundaries of the Tuttletown and Glory Hole Recreation Areas;
- No fishing is permitted below the dam to the buoy line;
- No Swimming Zones—No swimming is allowed at marina and launch ramps;
- Reservoir Management Zone A—All boating uses are allowed;
- Reservoir Management Zone B—Five mph "no wake zone" provides for slow boating and fishing areas. This protects the health and safety of others in the marinas, docks, and boat launch areas and helps minimize shoreline erosion (Figure 5-11); and
- Reservoir Management Zone C— No boating is allowed in designated swimming areas and in areas off limits for operations, such as the dam and spillway areas.

Use Permits. Permits are issued to regulate the allocation and intensity of use for activities that are in high demand or that have significant safety or environmental concerns (Reclamation 1995). Reclamation regulates the following activities through special use permits, contracts, and other rights of use processes (Laird 2007):

- White-water rafting;
- Fishing derbies;
- Model aircraft use;
- Houseboat launching and retrieving;
- Mountain bike races;
- Triathlons;
- Search and rescue dog trials;
- CAL FIRE fire training;
- Large group camping events;
- Group events involving eight to twelve rented houseboats that are operated together;
- Horseback trail rides events;
- Slalom water ski course events (right-of-use permit);
- Commercial recreation gold panning access to private gold panning area (right-of-use permit); and
- Other uses not specified above.

Special Events. A special event permit is required for short-term special events or activities that are not inherently commercial activities conducted at the New Melones Lake Area. Special event permits are issued only for qualifying events, as described in

the Schedule of Fees for Special Events included in Appendix E. Fees for special event permits include expenses incurred for agency administration, processing, and monitoring of the event, as well as the fair market value or reasonable and customary use fees for like events, activities, or land uses charged by other agencies or entities in the market area. Special events or activities must comply with all requirements in 43 CFR, Part 429. Events that are within the normally occurring and approved range of activities authorized by concession contracts may not require a permit. Reclamation evaluates the concession sponsored event or activity and determines the need for permits. Additional guidance for special events and other activities not covered by the Schedule of Fees for Special Events is found in 43 CFR, Part 429.

Concessionaire Agreements. Concessionaire agreements are prepared with private entities that are permitted to operate businesses at the New Melones Lake Area. Reclamation uses these agreements to achieve needed recreational support services, programs, public safety features, and facilities and as a means for disseminating public use information (Reclamation 1995). Concessionaire agreements include adequate water quality protection measures, public safety requirements, medical and emergency response requirements, and environmental protection standards. New Melones has one concessionaire agreement at the New Melones Lake Marina, located in the Glory Hole Recreation Area.

Boating. Motorboats must be equipped with personal flotation devices, a backfire flame arrester, muffling and ventilation systems, a sound signaling device, navigation lights, and a fire extinguisher, as required by the US Coast Guard and California Department of Boating and Waterways (Reclamation 2007c). Kayaks, canoes, and sailboats used in public waters must be equipped with personal flotation devices, a sound signaling device, and navigation lights. Specific boating equipment requirements are outlined in the "ABCs of the California Boating Law" (California Department of Boating and Waterways 2007). Reclamation seeks to comply with boating laws and regulations, such as the California Boating Law of 2006 and the Harbors and Navigation Code.

Caves. Caves in the New Melones Lake Area are concentrated along the Stanislaus River near the South Fork confluence, in Coyote Creek, Grapevine Gulch, and Skunk Gulch, and in all areas of soluble limestone terrain (Reclamation 1995). The caves are important components of the natural and cultural systems, with an impressive range of resource values. Reclamation provides limited entry to caves through fencing and other means in the Stanislaus River canyon due to safety hazards, such as flooding.

According to the New Melones Lake Revised Cave Management Plan, caves can present a hazard to the untrained public (Reclamation 1996), such as falling or getting lost. Because many of the caves are on steep rock faces, access to them may be hazardous. Depending on a variety of factors, caves in the New Melones Lake Area may be gated, ungated, or partially or wholly submerged by water due to the reservoir.

Abandoned Mines. Reclamation closes unsafe or potentially hazardous areas in a manner compatible with ecological concerns (Reclamation 1995). These areas include caves, old mine shafts, exposed steep areas, and high fire hazard areas.

The exact number and location of abandoned mines is not centrally cataloged (Laird 2007). The USACE filled in some mines at the beginning of the New Melones project. In an effort to avoid attracting visitors to potentially hazardous abandoned mines, these features are not signed or identified on public materials.

Illegal Dumping and Drug Manufacturing. Municipal solid waste is more commonly known as trash or garbage and consists of everyday items requiring disposal. Municipal solid waste can include leftover household products that contain corrosive, toxic, ignitable, or reactive ingredients. This type of waste is known as household hazardous waste. Such products as paints, cleaners, oils, batteries, and pesticides that contain potentially hazardous ingredients require special care during disposal.

Illegal dumping of municipal solid waste is a problem at New Melones. This is especially true on Reclamation land in Tuolumne County (Laird 2007), where the public must pay to dispose of household hazardous waste, providing them with an incentive to dump household waste illegally. In Calaveras County, disposal of household hazardous waste is covered by landowners' taxes.

Illegal drug use, sales, and manufacturing present potential public health and safety hazards at the New Melones Lake Area. Drugs, such as methamphetamines, are manufactured and marijuana is grown in isolated areas on Reclamation lands (Laird 2007). As a result, illegal drug manufacturing material and hazardous waste is abandoned on New Melones lands, drug manufacturing areas are contaminated, and waste products may be dumped on the roadways. The presence of people involved in production, use, or sale of illegal drugs may present a hazard to other lake users who happen on such activities.

Public Services

Park Ranger services. Reclamation has a staff of both permanent and seasonal Park Rangers. Park Rangers' titles include Supervisory Park Ranger/Concession Specialist, Park Ranger, Park Ranger for Natural Resources, and Park Ranger Visitor Center Specialist. Examples of Park Ranger duties include traffic and crowd control, concession oversight, campground maintenance, special use permit issuance, natural resources maintenance and planning, volunteer management, education and outreach, interpretation, fee collection, and patrol. Reclamation Park Rangers are not authorized to perform law enforcement duties (see next section).

Reclamation Park Rangers perform safety inspections and encourage lake visitors to comply with state and federal safety laws and regulations. Reclamation Park Rangers also patrol recreational facilities, monitor compliance with permits and concessionaire agreements, and check on the condition of natural and cultural resources (Reclamation 1995).

Law enforcement services. Management of resources on Reclamation land emphasizes interagency coordination with federal, state, and local agencies, including the USFS, BLM, Tuolumne County, Calaveras County, USFWS, CAL FIRE, US Marshall's office, CDFG, and the City of Angels Camp.

State and local laws are enforced by the Sheriffs Department's of Tuolumne and Calaveras Counties in their respective areas of jurisdiction (Reclamation 1995). Reclamation contracts with Tuolumne and Calaveras County Sheriffs to provide enhanced law enforcement services. The Calaveras County contract provides a 40-hour per week, year-round deputy. The Tuolumne County contract provides additional law enforcement services on weekends through the summer recreation season. When needed, Reclamation Park Rangers contact the Sheriffs Departments by radios that are carried in all ranger vehicles and kept at Reclamation headquarters. The California Highway Patrol is responsible for enforcing the vehicle code. In general, the level of the sheriff patrols and presence at the New Melones Lake Area is limited, particularly given the size of New Melones Lake and its surrounding lands. Outside of the sheriff contracts, these agencies respond to the law enforcement needs at New Melones Lake on a case-by-case basis as their resources permit, with each case considered according to the nature of the particular violation and available resources. There have been incidents when county law enforcement officials have been unable to respond to Reclamation's law enforcement needs. Requests for law enforcement services are increasing because the number of visitors to New Melones is increasing (Laird 2007).

Tuolumne and Calaveras County Sheriff boat patrols share responsibility for enforcing boating laws at New Melones Lake and at Tulloch Reservoir, which is also on the Stanislaus River, just south of New Melones Lake (Reclamation 1995). Due to staffing limitations, it is difficult to provide effective patrols on New Melones Lake (Laird 2007).

Reclamation has three boats available for use on New Melones Lake most of the year and provides regular boating safety patrols on the lake during the summer (Reclamation 1995; Laird 2007). One of the boats is designated for patrolling the lake. The focus of this patrol is to advise boaters of unsafe acts, to inspect boating safety equipment, and to provide boaters with current safe boating regulations and safety information. In addition, Reclamation patrol boats are used to assist disabled boaters and to mark boating waterways and hazards (Appendix G).

The New Melones Lake Area is within the CDFG Sierra District and Tuolumne County Region (Reclamation 1995). The CDFG issues fishing and hunting permits and is empowered to enforce the State Fish and Game Code, including issuing violations and revoking sport fishing and hunting privileges at the New Melones Lake Area. The CDFG also regulates catch from fishing tournaments and issues dredging permits as needed.

The PWMA access road crosses approximately 1.8 miles (3 kilometers) of the PWMA (Reclamation 2007a). This section of road was temporarily closed to public vehicles on December 15, 2002, as a preventative measure to stop increasing damage to natural resources from illegal and inappropriate uses by both local and visiting recreationists. Illegal actions, including target shooting, poaching, off-road driving, fire building, littering, dumping large debris and hazardous materials, vandalizing, and illegal camping, have resulted in soil erosion, habitat degradation, and widespread damage to the natural resources. Illegal activities also have compromised the safety of the public and adjacent

landowners in the area. Closing the road to public vehicles has minimized further degradation of this area.

The animal control units of the respective counties are called approximately ten times a year, usually for a vicious dog, distressed animal, or livestock trespass (Laird 2007). However, the animal control units typically respond to only two of the ten calls.

Fire Protection Services. Reclamation evaluates and maps fire hazards throughout its lands, with a focus on current and proposed recreational facilities and adjacent residences and structures (Reclamation 1995). Hazard analysis is based on fire behavior, fuel load, slope, probable location and rate of ignition, potential loss of life and valuable property, and access restrictions.

As the underlying federal land manager, Reclamation has contracted fire suppression with the State of California. CAL FIRE is the primary agency responsible for wildland fire suppression at New Melones Lake (Reclamation 1995). The agency maintains a fire unit facility on Reclamation lands on Peoria Flat Road within the PWMA. Inmates from the minimum security facility Baseline Conservation Camp provide fire protection in exchange for housing its facility on Reclamation land. The Altaville Melones Fire District provides fire protection within the Glory Hole Recreation Area. The Altaville Melones Fire District provides fire protection for the New Melones Lake Marina through an MOU between Reclamation, the marina, and Altaville Melones Fire District. Columbia Fire District provides fire protection within the Tuttletown Recreation Area.

Reclamation provides limited initial fire response on its lands at New Melones Lake, which is subject to federal policy and guidelines of initial attack of wildland fire (Reclamation 1995). The primary firefighting equipment that Reclamation has access to consists of the following (Laird 2007):

- Hydrants in campgrounds and day use areas;
- Hydrant system around administration buildings;
- Visitor center and maintenance building with burglar alarms but no fire hydrant systems;
- A shaded fuel break on the visitors center side of SR 49;
- Marina with fire alarms in the store and covered area of docks, water storage tanks, and a Trimex 30 Fire Foam System;
- Marina with hand-held fire extinguishers on open docks;
- Marina fireboat;
- Fire hydrant system on land around the marina;
- Helitack base at Columbia airport;
- Two Park Ranger vehicles with slide in firefighting units; and

- Park Rangers carrying hand tools and five-gallon water backpacks to put out campfires in case of emergency.

Reclamation's responsibility for initial attack of wildland fire suppression is relinquished when a CAL FIRE fire unit or any fire unit having a mutual aid agreement with CAL FIRE arrives at the fire. Requests for fire protection services remain constant (Laird 2007). Reclamation is responsible for all wildland fire activities on Reclamation lands.

Reclamation takes a proactive approach to preventing fires by clearing vegetation along roads and clearing overgrown vegetation from campgrounds and other areas that people are likely to use (Reclamation 1995). A shaded fuel break is on the visitor center side of SR 49; another fuel break will be installed on the other side of SR 49 (Holsapple 2007). In addition, Reclamation participates in the Highway 108 Fire Safety Council, which prepares cooperative fire management strategies with other local fire control entities.

Vegetation is cleared by mechanical means (bulldozers, tractors), chemical application (herbicides), and by hand with the assistance of the California Department of Corrections (Sierra Conservation Corps inmate labor). Caltrans also carries out similar vegetation removal activities along SR 49.

Medical Services. Reclamation Park Rangers on permanent status are required to have first responder certification (Reclamation 1995). Temporary employees receive basic first aid and CPR training. Reclamation Park Rangers respond to most medical emergencies and provide emergency medical assistance commensurate with their training until an ambulance or the fire department arrives. In an emergency, Park Rangers call 911, which dispatches the fire department for assistance. The responding fire department is decided by the coordinated 911 system (Laird 2007). Requests for medical services are increasing because the number of visitors to New Melones is increasing (Laird 2007).

Reclamation's New Melones Park Ranger staff do not have the appropriate emergency medical response training necessary to carry out cave or cliff-face (rock climbing) rescues, nor do they have the authority to obtain this type of training (Reclamation 1995). Reclamation is responsible for managing the activities on lands under its jurisdiction and is thereby liable for the potential consequences of activities that occur on Reclamation lands.

Reclamation provides fliers to educate the public about rattlesnakes and removes rattlesnakes from campgrounds. Reclamation Park Rangers may provide first aid to snakebite victims, but more extensive treatment is required and must be provided by area hospitals. In 2006, there were three rattlesnake bites in the New Melones Lake Area (Laird 2007).

5.2.14 Invasive Species Control

Prescribed Fire

The draft Fire Management Plan (draft FMP) provides interim guidance for fire management in the New Melones Lake Area (Appendix D). This document recognizes fire as a resource to assist in managing for desired range conditions and proposes methods to incorporate prescribed fire into its range management program. The draft FMP incorporates several aspects of the National Fire Plan, including use of the fire regime condition class (FRCC) method. This method uses established reference conditions created by assessing ecological features and natural fire regimes in healthy rangelands. Features assessed in the field to determine the FRCC include vegetative and disturbance attributes, such as the extent of nonnative species invasion. These features can be used to determine the overall ecological health of a particular study area. Reclamation and partnering agencies use this data to determine range management priorities, including making decisions as to when and where prescribed fires may be appropriate.

Weed Control

Most of the grasslands found in the New Melones Lake Area have been converted from perennial native bunchgrasses to nonnative annual grasses. Tree and shrub communities show a greater incidence of native species. In the PWMA, which has extensive rangeland, 74 nonnative species have been recorded (Evens et al. 2004), most of which are ground layer species. While many of these species have substantially replaced the role of native grasses in terms of providing forage for wildlife and livestock, others such as cheatgrass (*Bromus tectorum*) are able to change the fire and hydrologic regimes and seriously alter range conditions.

Grazing

Six grazing allotments, totaling 3,746 acres (1,515 hectares), are on BLM lands adjacent to the project area. One grazing allotment is permitted on USFS land in the Clark's Flat area. The allotment encompasses 480 acres (190 hectares) and has a season of use from May 1 through September 15. Although historically allowed, no grazing is currently permitted on New Melones lands.

Reclamation previously leased 4,394 acres (1,780 hectares) of land in two areas (Bear Creek and Glory Hole Recreation Areas) for livestock grazing. Subject to a grazing suitability analysis, grazing may continue, but its purpose and intensity would be directed by water quality concerns, by vegetation management goals (usually related to invasive species control and wildfire prevention), and by policies and actions identified in current Reclamation guidance.

5.2.15 Fire Management

Wildland Fire

Fire is an integral part of California's Sierra Foothill landscape. Historically, frequent low- or mixed-severity fire was common at New Melones. Now, much of this area has transitioned to stand-replacing fire due to increased fuel loads and overstocking. Wildland fire fuels consist of live and dead vegetation, including branches (on the tree or on the ground), leaves, needles, seeds, and cones. Wildland fire fuels continue to accumulate due to successful fire suppression and a lack of prescribed fire and other fuel reduction strategies.

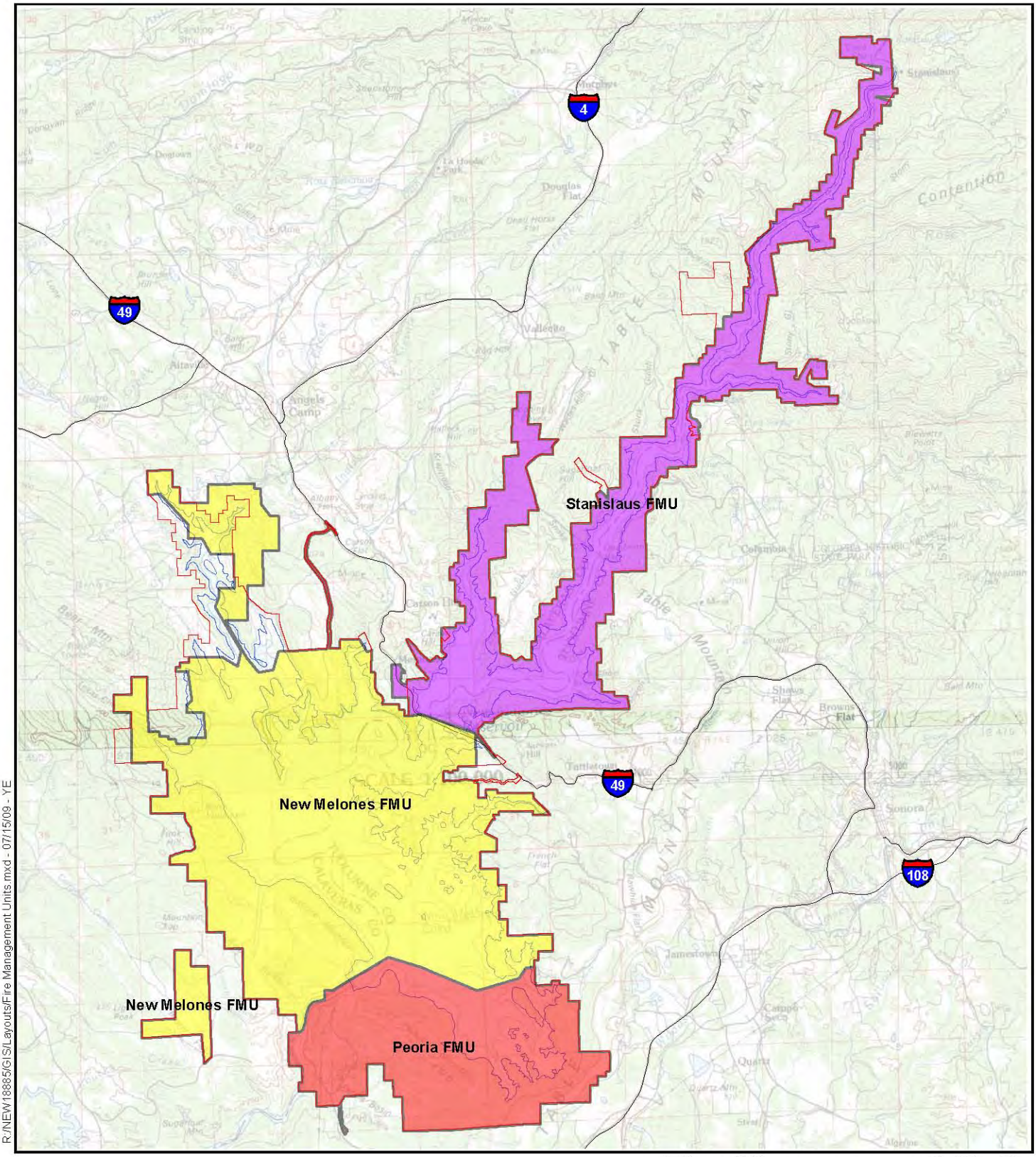
Fuel conditions have also been affected by an increase of nonnative invasive species, such as star thistle (*Centaurea solstitialis*). Burning tends to stimulate star thistle germination and may lead to more robust plants following fire due to reduced competition from native species. In addition, star thistle retains moisture longer and grows larger than native plants; thus, the fuel it creates is more concentrated and burns slower and hotter, increasing fire severity.

Deteriorating forest health creates fuel conditions that contribute to high-intensity fires. Tree density, dense patches of shrubs, and introduced weeds increase fuel loads and competition among species, promoting tree mortality and disease and resultant high-intensity fire.

Fire Management Units. Fire is managed in three distinct fire management units (FMU) on New Melones project lands (New Melones, Stanislaus, and Peoria; Figure 5-12). An FMU is any land management area definable by objectives, management constraints, topographic features, access, value to be protected, political boundaries, fuel types, and major FRCC groups that set it apart from the management characteristics of an adjacent FMU. The FMUs on New Melones project lands encompass both Reclamation and non-Reclamation lands. The New Melones unit's primary resource management strategy is to protect the wildland-urban interface (WUI) and high-value watersheds; the Stanislaus unit's primary strategy is to protect watersheds and the WUI; and the Peoria unit is primarily managed to protect high-value habitat and the WUI (Reclamation 2007b).

New Melones FMU consists of four fuel types, totaling 6,589 acres (2,670 hectares). The eight management areas in the FMU are Tuttletown French Flat, Bear Creek, Dam and Spillway, Westside, Greenhorn Creek, Glory Hole, and Carson. The northern half of Bear Creek and the eastern two-thirds of Carson are managed under different FMUs. Fire and fuels management in this unit are necessary to protect resource values, such as water quality, watershed values, private property, developed recreation sites, cultural resources, special status species, wildlife habitat, air quality, recreation, and visual resources. The following communities/WUI areas are at risk from wildland fire: Angels Camp, Stanislaus, Tuttletown, Jamestown, Carson Hill, Cloy House, Copperopolis, and Jackass Hill.

Wildland fires in the western US have become increasingly dangerous due to the proximity of structures and fuel buildup (invasive weeds or vegetation that would have



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Fire Management Units

New Melones Lake Area, California
Central California Area Office

Figure 5-12

burned more often, but due to successful fire suppression, continue to accumulate). In response to the risks wildland fires pose to firefighters and the impacts on communities, the National Fire Plan was initiated by a partnership of government land management agencies in 2000. This coordinated effort to protect communities and natural resources from increasingly severe wildfire resulted in the 10-Year Comprehensive Strategy and specific goals and objectives to guide fire management planning (Reclamation 2007b). In addition to the guidance provided by the National Fire Plan, the FRCC method was established. FRCC is an interagency standardized tool for determining the degree of departure from reference condition vegetation, fuels, and disturbance regimes. Assessing FRCC can help guide management objectives and set priorities for treatments. Reference conditions are vegetation and disturbance attributes that can sustain current native ecological systems and natural fire regimes. Reference conditions are determined by experts through professional judgment, published literature, and historical information using standardized computer models. This quantitative method links landscape-scale assessments and stand-level classifications (Hann et al. 2003). The objective of this method is to target those areas exhibiting the greatest departure from reference condition as priority for fuel treatment.

Development around the New Melones Lake Area and surrounding areas continues to increase as demand for recreation and housing in the area increases. Greater numbers of people, homes, and structures within the WUI, coupled with accumulating hazardous fuels due to fire suppression and the lack of fuel management measures, creates a dangerous situation. Many of Reclamation's lands are not easily accessible, further increasing the fire hazard. The three FMUs in the decision area list WUI as a major decision factor (Reclamation 2007b). As the WUI continues to grow, it will become more of a driving factor on fire suppression and fuels management in the future. A draft Fire Management Plan is included in Appendix D.

The CAL FIRE-Tuolumne/Calaveras Unit is the principal agency responsible for fire suppression in the project area. On adjacent BLM lands the levels of resources available have not allowed for ideal fire management (BLM 2006). Competition among agencies for CAL FIRE staff and equipment could lead to a lack of personnel and equipment to accomplish fuel treatment goals, resulting in a backlog of high priority fuels management projects.

Smoke management and associated air quality concerns may increase as resource users and residences increase in and around the project area, potentially limiting prescribed burning activity.

Noxious and invasive weed species will continue to colonize disturbed sites. This trend will likely increase if fire severity and size increases and if fuels continue to build up as a result of fire suppression.

5.2.16 Cultural Resources

The *New Melones Reservoir Cultural Resource Overview, Calaveras and Tuolumne Counties, California* (Pacific Legacy 2008) was completed for this project and provides a

detailed account of cultural resources and research orientations within the New Melones Lake Area. The following discussions are taken from that document.

Compliance for Reclamation Undertakings

Reclamation is responsible for compliance with Section 106 and 110 of the NRHP. Section 106 of the NHPA requires federal agencies to take into account the effects of their undertakings on historic properties and can afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment while Section 110 of the NHPA sets out the broad historic preservation responsibilities of the federal agency and is intended to ensure that historic preservation is fully integrated into ongoing programs.

For project specific compliance, Reclamation must take into account the effects its undertakings will have on historic properties as defined in 36 CFR, Part 800.16 (1). When the effects of an undertaking are not fully known or the project extends over a period of years, Reclamation may elect to follow an alternative process following procedures found in 36 CFR, Part 800.14 which allows for the development of a programmatic agreement between consulting parties. Under NEPA (42 USC, Sections 4321-4327), Reclamation is required to consider potential environmental impacts and appropriate mitigation measures for projects with federal involvement.

Projects undertaken by Reclamation must follow directives and guidelines found in Reclamation Manual Policy and Directives and Standards. LND P01, LND 02-01, and LND 07-01. LND P01 establishes policy and authority for cultural resource identification, evaluation, and management of cultural resources. LND 02-01 provides directives and standards and clarifies the role of Reclamation regarding implementation of its cultural resources management responsibilities. LND 07-01 provides procedures protocols for inadvertent discoveries on Reclamation land for cultural items which fall under the authority protection of the Native American Graves Protection and Repatriation Act (NAGPRA).

For federal undertakings and administration, which require compliance with Section 106 or Section 110 of the NHPA, federal significance or criteria apply. Cultural resources significance is evaluated in terms of eligibility for listing on the NRHP. NRHP criteria for evaluation are defined as follows:

The quality of significance in American history archaeology, and culture is present in districts, sites, buildings, structures, and objects of state and local importance that possess integrity of location, design, setting, materials, workmanship, feeling and association and that:

- Criterion A: are associated with events that have made a contribution to the broad pattern of our history;
- Criterion B: are associated with lives of significant people in our past;
- Criterion C: embody the distinct characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic

values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or,

- Criterion D: have yielded, or are likely to yield, information important in prehistory or history (36 CFR, Part 60.4).

The analysis of potential impacts to historic properties employs the Criteria of Adverse Effect as developed by the ACHP in its regulations for the "protection of Historic Properties (36 CFR, Part 800). Adverse effects can occur when and undertaking may alter any of the characteristics of a historic property that qualify it for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, or association. Examples of adverse effects include:

- physical destruction or alteration of the property;
- isolation of the property from or alteration of the property's setting when that character contributes to the property's qualification for the NRHP;
- introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting;
- neglect of a property resulting in its deterioration or destruction; and,
- transfer, lease, or sale of the property (36 CFR, Part 800.5(a)(2)).

To be considered as a historic property, a cultural resource must retain the quality of integrity. Integrity is defined as the degree to which a property retains or is able to convey the essential characteristics defined under one of the four eligibility criteria, listed above. These characteristics may be expressed through integrity of location, design, setting, materials, workmanship, feeling, and association of a property. An archaeological property may retain sufficient integrity to qualify it for the NRHP if the property retains the ability to yield information important to an understanding of history or prehistory. It must be demonstrated to have the potential to yield, or have previously yielded, data that can be used to address important research questions.

Reclamation will complete this process for site-specific activities as they are designed and a decision is made to fund them.

Summary of Cultural Resources in the New Melones Lake Area

A total of 23,265 acres has been surveyed, leaving 6,735 acres of the New Melones Lake Area unsurveyed. Of the unsurveyed area, only 4,672 acres are above the current maximum pool. A total of 643 cultural resources have been recorded within the New Melones Lake Area and another 82 cultural resources have been recorded within a quarter mile. Of the 643 cultural resources within the New Melones Lake Area, four have been determined to be noncultural in nature; however, the four sites remain on the record and are therefore included here. Based on ethnographically available information and location data, portions of five Central Sierra Miwok settlements may exist within the New Melones Lake Area. An additional six ethnographically documented settlements are

within a quarter mile of the New Melones Lake Area. Three general site categories have been identified: prehistoric (which includes a multiple prehistoric site type), historic (which includes a multiple historic site type), and multi-component. Within these categories, more specific site types for the New Melones Lake Area have been identified: bedrock mortar, midden, cave, and rock art. Historic site types are mining, homestead/ranching, water/power systems, transportation, cemetery, and, historic feature. Some of the multiple prehistoric site types also contain other site constituents that were never recorded in isolation and, therefore, did not warrant their own site type designation (for example, lithic scatters, human remains, house depressions, shell scatters). In addition to these site categories, there is a multi-component site type, which is defined by the presence of both historic and prehistoric remains (Pacific Legacy 2008). Estimates of the potential for each management area to yield undiscovered resources are provided in Table 5-14. Note that management areas Middle Bay, North Bay, and South Bay are under the maximum pool and are therefore inaccessible to a new survey for undiscovered resources. Bowie Flat, Dam and Spillway, and Mark Twain Management Areas have been completely inventoried, making discovery of previously unidentified resources unlikely.

Table 5-14: Potential for Undiscovered Resources By Management Area

Management Area	Site Density[1]	Sites Recorded	Acres Above Maximum Pool Unsurveyed[2]	Potential for Surface Survey to Yield New Resources
Stanislaus River Canyon	0.162	47	1,487	Very High
Parrotts Ferry	0.070	91	593	Very High
Coyote Creek	0.036	21	473	High
Westside	0.015	25	815	High
Tuttletown	0.035	20	286	High
French Flat	0.061	17	119	Moderate to High
Peoria Wildlife Area	0.017	43	269	Moderate
Bear Creek	0.030	38	132	Moderate
Camp Nine	0.061	21	151	Moderate to High
Carson	0.045	103	81	Moderate
Greenhorn Creek	0.010	8	86	Low to Moderate
Glory Hole	0.017	16	45	Low to Moderate
Middle Bay	0.020	52	0	Low
North Bay	0.026	59	0	Low
South Bay	0.027	23	0	Low
Bowie Flat	0.017	8	0	Low
Dam and Spillway	0.015	39	0	Low
Mark Twain	0.089	12	0	Low

Source: Pacific Legacy 2008

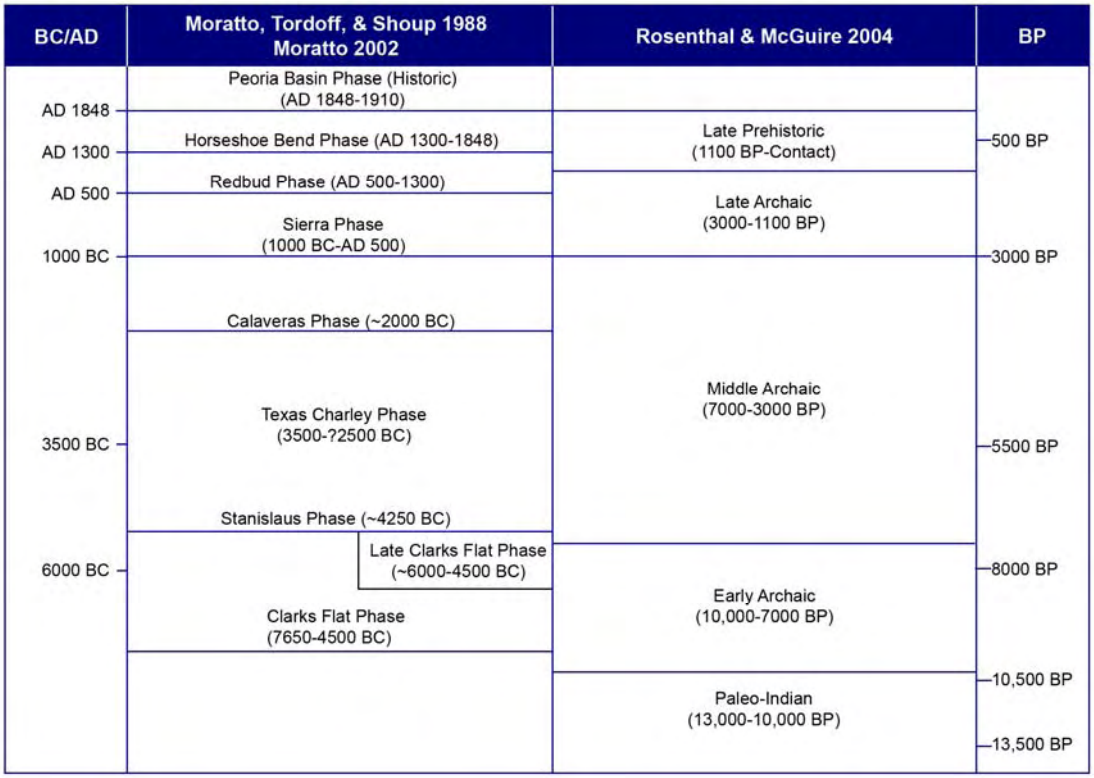
[1]Based on number of resources that have been previously recorded in the management area.

[2]"Unsurveyed" in this table refers to areas that have not previously been surveyed for cultural resources.

Archaeological Setting

The New Melones Lake Area has been the subject of numerous cultural resource studies beginning in the 1940s (Fredrickson 1949) and continuing to the present day. The data generated from cultural resource management projects have formed the basis on which the cultural history of the area has been constructed and provides evidence for a cultural occupation of the area as early as 8000 BC. Moratto and colleagues (Moratto, Tordoff, and Shoup 1988; Moratto 2002) have proposed a prehistoric (Indian) cultural sequence for the area that includes at least eight defined phases in six temporal periods. Phases are formal cultural units with continuity over a geographical area within a given temporal period. In their recent reappraisal of the central Sierra Nevada, Rosenthal and McGuire (2004:12-22, 129-148) provide a useful critique of the earlier New Melones sequence and offer an alternate temporal sequence. In an effort to simplify the sequence, they employ a more general periodization. Both chronological sequences are provided in Table 5-15.

Table 5-15: Cultural Chronologies for the New Melones Lake Area



Source: Pacific Legacy 2008

Although evidence for occupation of the area before 6000 BC is scant, what evidence does exist suggests that people inhabited the area in highly mobile hunting and gathering bands. This occupation is evidenced by large lanceolate-stemmed and square-stemmed bifaces manufactured of chert. The oldest documented cultural phase during this time is the Clarks Flat Phase (7650to 4500 BC). The phase is included in Rosenthal and

McGuire's Early Archaic, but it is suggested that the identification of the Clarks Flat Phase may need to be reexamined.

The period from 6000 to 3500 BC is poorly known archaeologically in the New Melones Lake Area. However, based on available data it has been argued that the period retains some cultural continuity from the previous one (Peak and Crew 1990:229; Moratto 2002:37-38). The period includes a Late Clarks Flat Phase (circa 6000 to 4500 BC), which retains many characteristics of the earlier Clarks Flat manifestations, but with a broader subsistence base, and a Stanislaus Phase (circa 4250 BC), defined on the basis of the Stanislaus broad-stemmed projectile point (Peak and Crew 1990) and a broadening of the resource base. The Late Clarks Flat Phase falls within Rosenthal and McGuire's Early Archaic (8000 to 5000 BC), while the Stanislaus Phase falls at the transition between their Early Archaic and Middle Archaic (5000 to 1000 BC).

Two cultural phases with a possible intervening hiatus are encompassed by the 3000 to 1000 BC timeframe: the Texas Charley Phase and the Calaveras Phase, provisionally distinguished by differences in projectile point type. The Texas Charley Phase (circa 3500 to 2500 BC) is defined by large lanceolate bifaces, a well-developed percussion-flaked chert and greenstone industry, and stone tools distinguished by heat treatment and the masterful use of exotic chert. While the Calaveras Phase (circa 2000 BC) is not well defined, it is characterized by Humboldt and Pinto series points and very minimal occupation at several sites. Both phases fall within Rosenthal and McGuire's Middle Archaic.

Occupation of the New Melones Lake Area during the 1000 BC to AD 500 period is characterized by middens with housepits, indicating intensive occupation by large populations. Cemeteries also begin to appear in the archaeological record during this period, along with mortuary caves. This period was during the Sierra Phase, characterized by shell beads and ornaments, Elko series projectile points, and exotic obsidians, suggesting a sophisticated long-distance trade network between the New Melones Lake Area and both the coast and areas to the east. The Sierra Phase falls within Rosenthal and McGuire's Late Archaic (1000 BC to 900 AD).

Another remarkable shift in use of the area took place between AD 500 and 1300. Archaeological sites occupied intensively during the preceding period lack evidence of use during this period, which includes the Redbud Phase. This is characterized by sites with poorly developed deposits and based largely on an analysis of organic remains (teleological examination) of what is absent relative to the previous and subsequent phases. Thus, the Redbud Phase is still quite poorly understood. However, one debate engendered by the Redbud Phase concerns the introduction of new artifact types, most importantly the Rosegate arrow point. Whether this represents population replacement by the bow and arrow wielding Miwok or the continuation of a gradual shift toward bow and arrow technology remains a question. The Redbud Phase falls within transition between Rosenthal and McGuire's Late Archaic and Late Prehistoric (900 AD to Contact).

Ethnographic Setting

The period from AD 1300 to 1848 is characterized by a shift toward the ethnographic cultural pattern of the Central Sierra Miwok. This period represents the most intensive occupation of the New Melones Lake Area and is also the most widespread. One cultural phase is identified within this period: the Horseshoe Bend Phase. Settlements associated with this phase are spaced more closely together and individual sites are highly organized internally. During this phase, several new technologies replace older ones and an intensive acorn-based economy is evident in all facets of the archaeological record. Trade connections with the Great Basin to the east are clearly demonstrated by the presence of desert side-notched and cottonwood triangular projectile points and by the predominance of Bodie Hills obsidian. The Horseshoe Bend Phase falls within Rosenthal and McGuire's Late Prehistoric.

Most of what researchers know about Central Sierra Miwok lifeways derives from ethnographic data (Pacific Legacy 2008). Traditionally, Miwok social organization was rooted in the *nena*, the place of origin of the patrilineal family. Each nena comprised a semiautonomous political unit. The Miwok preferred to settle on flat, south-facing slopes or near small drainages. The later Central Sierra Miwok made permanent settlements within their territory, their hunter-gatherer mode of subsistence appears to have depended on seasonal travel to higher and lower elevations to obtain food not found in the vicinity of their permanent settlements. The Miwok also participated in an extensive trade network, connected by trails, which facilitated trade with their neighbors.

The New Melones Lake Area encompasses lands traditionally used by the Central Sierra Miwok, who still maintain a strong local presence in the surrounding communities. There are three federally recognized bands of Miwok who have reservation lands in Calaveras and Tuolumne Counties. Contact with Gold Rush-era settlers was devastating to the Miwok and other native populations. In addition to exposure to introduced diseases, they were the victims of much violence and discrimination. However, even as they lost most of their land base, they continued the traditions of cultural and sacred use of lands and natural resources.

Ethnographers have documented 46 Central Sierra Miwok settlements and villages in and around the New Melones Lake Area, derived from interviews conducted well after the devastation of the Gold Rush. During archaeological studies conducted before the dam was constructed and the lake was filled, ceremonial structures, a mourning site, petroglyphs, cemeteries, isolated burials, and mortuary caves were recorded. In conjunction with archaeological mitigations, the Miwok entered into a burial agreement with the National Park Service (NPS) before the NAGPRA was passed.

The Tuolumne Rancheria was established in 1910 and quickly became a refuge for displaced Indians, including some of the remaining Central Sierra Miwok and their Native neighbors (Levy 1978). The Chicken Ranch Rancheria of Me-wuk Indians, who currently hold trust land in Jamestown, are also descendants of the Central Sierra Miwok in Tuolumne County. In Calaveras County, the Calaveras Band of Miwok Indians and the Calaveras County Mountain Miwok Indian Council, near West Point, maintain communities and traditions. Several individual Miwok families also reside in and around

the New Melones Lake Area in Jamestown, Columbia, Sonora, Murphy's, Vallecito, Carson Hill, and elsewhere.

While the devastation of the Gold Rush and its aftermath disrupted many traditional practices and lifeways, the descendents of the Central Sierra Miwok flourish today as their culture, language, and traditions continue to be passed down through the generations. Celebrations, or "big times," are regularly held, and many traditional crafts, including baskets, are still produced. The Tuolomne Rancheria has developed a Cultural and Historic Preservation Committee to represent their interests and those of other Sierra Miwok (Fuller 1996).

Post-Contact Historic Setting

Great turmoil and rapid change in the area characterized the period from AD 1848 to 1910. During the California Gold Rush, the traditional lifeways of the native inhabitants of the New Melones Lake Area were disrupted by large numbers of Euro-American gold seekers, merchants, and other fortune seekers. The population expansion in the area was rapid and overwhelming, with the Central Sierra absorbing the vast influx of California's gold mining economy. The impact on the area's native populations was profound. While these changes are charted in historical documents, archival records, and oral histories, the archaeological record provides the time depth to study changes in the material culture and lifeways of the Central Sierra Miwok that are either inaccessible or unremarked in traditional histories. This period is dubbed the Peoria Basin Phase and is quite widespread in the New Melones Lake Area. However, Peoria Basin components are often sparse, leaving only minimal traces of the fundamental reorganization of Native American tradition that was taking place. Peoria Basin Phase material evidence indicates the maintenance of tradition, the adoption of new materials to manufacture traditional items, the acceptance of Euro-American material items, and the abandonment and disintegration of long-held economic and trade networks (Moratto, Tordoff, and Shoup 1988; Moratto 2002). This period does not correspond to any of Rosenthal and McGuire's proposed periods for the New Melones Lake Area.

Euro-American history in the area is divided into three periods: the Spanish Era (AD 1769-1821), the Mexican Era (AD 1821-1848), and the American Era (AD 1848-1950).

The expansion of the Spanish frontiers northward from Mexico into Alta California began in the eighteenth century. The California interior was not settled by the Spanish pioneers, although a number of Spanish expeditions explored portions of the San Joaquin and Central Valleys beginning in the 1770s. In 1806, an expedition headed by Gabriel Moraga followed the San Joaquin River to the Merced River and discovered the Tuolumne and Stanislaus Rivers (Hoover et al. 1990:487; Jackson et al. 1976:2). Two years later, Moraga returned to the Stanislaus River area in search of a suitable interior mission site but deemed the area undesirable (Jackson et al. 1976:4-5).

In 1821, Mexico rebelled against Spain and gained its independence. The Mexican government sent several military expeditions in 1828 and 1829 to capture a renegade missionized Native American named Estanislao, who had escaped the mission system

with a band of neophytes and returned to the Stanislaus River region. Mariano Vallejo succeeded in driving Estanislao away from the Stanislaus and Tuolumne River region by burning the river banks. Vallejo was rewarded with a land grant in 1843 for the 49,000-acre Rancheria del Rio Estanislao, which included portions of San Joaquin, Calaveras, and Stanislaus Counties (Jackson et al. 1976:7). The rancho was just southwest of the New Melones Lake Area and included what is now Tulloch Lake (United States District Court 1857).

Also during the Mexican era, three American parties crossed the Sierra Nevada, through the Stanislaus River region, although it is not known if they entered the New Melones Lake Area. Jedediah Smith crossed the Sierra eastward in May 1827, somewhere between Lake Tahoe and Kings River. According to Jackson et al. (1976:12), current historical research appears to support the theory that Smith followed the Stanislaus River route into the Sierra. The John Bidwell party crossed the Sierra in 1841 en route to California from Nevada and may have followed the Stanislaus River forks as the party found its way down out of the mountains (Jackson et al. 1976:15). In AD 1844, John C. Fremont's Second Expedition entered California at Carson Pass and stayed at Sutter's Fort for several weeks. From there, the party traveled south to the Stanislaus River near Ripon, approximately 35 miles west of the New Melones Lake Area (Jackson et al. 1976:17).

Following the Mexican-American War from 1846 to 1848 and the signing of the Treaty of Guadalupe Hidalgo, Alta California became part of the United States, beginning the American Era. The area surrounding New Melones Lake was first settled by Euro-Americans following the discovery of gold at Coloma in 1848. This discovery led to an influx of miners, who sought rich placer deposits along the Stanislaus River and its tributaries. As new deposits were discovered, camps and towns were established near the discoveries and these quickly developed into communities to provide for the needs of an expanding population. These circa 1848-1850 mining communities included Angels Camp, Mokelumne Hill, Chili Gulch, Carson Hill, Robinson's Ferry, Melones, Pine Log Mining Camp, Columbia, Sonora, and Murphys (Costello and Cunningham 1985; Hoover et al. 1990; Jackson et al. 1976; Shoup and Greenwood 1984). These communities reflected a diverse ethnic population, including Mexicans in Melones, Italians along Angels Creek, Italians and Chinese at Robinson's Ferry, Chileans in Chili Gulch, Austrians and Yugoslavians at the later New Melones mines, and other northern Europeans, such as English, German, and Swedes, throughout the area (Greenwood and Shoup 1983). Numerous mines and mine claims are located within the New Melones Lake Area, many of which are clustered in the Carson Hill-Melones region that was traversed by the Morgan-Melones vein (Jackson et al. 1976:44). Mines within the Calaveras County portion of the New Melones Lake Area include the Garibaldi Mine, the Carson Creek Mine, part of the Carson Hill Mine complex (which includes the Adelaide Quartz Mine, Bright Star Lode, Calaveras Quartz Mine, Santa Cruz Lode, and Stanislaus Quartz Mine), and the Vonich Mine. Mines within the Tuolumne County portion of the New Melones Lake Area include Bell Mine, Densmore Mine, Punchbowl Mine, Horseshoe Bend Mine, and Norwegian Mine (Jackson et al. 1976; Moratto, Tordoff, and Shoup 1988:393).

In addition to these communities and mines, other industries developed to support the needs of the Gold Rush, including agriculture, ranching, a water system, and transportation systems.

Cattle ranching boomed from 1850 to 1860 in response to the Gold Rush population influx. By the 1860s and 1870s, many lands had been cleared of trees, and agriculture had become increasingly important due to the high costs of importing food from Hawaii and Chile. In the 1870s and 1880s, fruit orchards became an expanding agricultural industry. In the New Melones Lake vicinity, the mountainous landscape limited homesteads and ranches to raising livestock and agriculture on the scale of truck farms, fruit orchards, and vineyards. Based on the historic records and survey results, most of the ranches and homesteads were established in the 1850s through 1890s along the creek banks of the Stanislaus River drainage system by settlers who arrived during the Gold Rush (Greenwood and Shoup 1983:251; Jackson et al. 1976). Early ranching and farming in the area were devoted to cattle, small gardens, and truck farms to supply the needs of the influx of miners. As settlements became more stable, the farms and ranches supplied such towns as Robinson's Ferry and Columbia. During the later nineteenth century and early twentieth century, the trend was toward consolidating smaller farms and ranches to create larger cattle ranches. As was common elsewhere in the United States, families often chose homesteads near each other to pool resources.

As hard rock and hydraulic mining became common in the 1850s, the need for large amounts of water led to the construction of numerous dams, ditches, and flumes throughout the region. Between 1851 and the late 1860s, more than 34 water and ditch companies were established in Tuolumne and Calaveras Counties (Jackson et al. 1976:83-84). As mining waned, the resulting water system was used to supply domestic and agricultural needs. Several large water companies emerged during the later nineteenth century. Tuolumne County Water Company eventually became one of the largest water companies in the area and was later reincorporated as the Tuolumne County Water and Electric Power Company. However, shortly thereafter however it was acquired by the Sierra and San Francisco Power Company in 1909. The original water company ditches and reservoirs remained in use until at least 1947 as part of the Pacific Gas and Electric Company water system (Tuolumne Utilities District 1947:2).

In the 1880s and 1890s, electric power became the new technology. With the demand for electric power and the increasing demand for water came plans for dams and hydroelectric power. In 1899, Charles Tulloch and Mrs. A. G. Lane established the San Joaquin Water Company, which built a concrete dam across the Stanislaus River above Knight's Ferry that sent irrigation water to the Escalon and Oakdale areas, as well as electric power to Angels Camp, Copperopolis, Oakdale, and Modesto (Jackson et al. 1976:207). In 1918, the Oakdale Irrigation District and the South San Joaquin Irrigation District began plans for the original Melones Dam, reservoir, and power plant near the current Melones Dam location (Jackson et al. 1976:210). After a hiatus of several years, dam construction was begun in 1925 and was completed in 1927. Melones Dam rose 210 feet above the bedrock and retained 112,500-acre-feet of water. Pacific Gas and Electric Company built a powerhouse below the dam to provide electricity for the area (Costello

1986:3; Jackson et al. 1976:212). In addition to the Melones Dam project, a second hydroelectric project, the Stanislaus Powerhouse or Camp Nine Project, was completed within the New Melones Lake Area. The Camp Nine Project was conceived to provide water and electricity for hydraulic mining and San Francisco street railways.

Transportation networks formed to provide access to the mining areas, to provide communication, and to provide delivery systems for living staples, equipment, and gold shipment. Initially, these networks were composed of pack trains of mules that followed trails between the communities. By the early 1850s, as the trails began to widen and become roads, freight wagons and stagecoaches were able to move along the system.

Crossing the Stanislaus River was accomplished using a series of ferries that included Robinson's Ferry, Parrotts Ferry, Central Ferry, Reynold's Ferry, Abbey's Ferry, and McLean's Ferry (a.k.a. Murphy's Ferry). Although the origins of many of these ferries are uncertain, Robinson's Ferry and McLean's Ferry were established around 1849. The rest of the ferries were operating by the 1860s (Jackson et al. 1976), and all remained in use through the nineteenth century. In the early twentieth century, many of the ferry crossings were replaced by bridges, such as the 1903 bridge at Parrott's Ferry and the 1910 bridge at Robinson's Ferry (Jackson et al. 1976:74; Shoup and Greenwood 1984:86). By the 1870s, railroads were extending into Calaveras, Tuolumne, and Stanislaus Counties but had not yet reached the current New Melones Lake Area. In 1897, the Sierra Railway proposed plans for the Angels Branch rail line from Jamestown to Angels Camp across the current New Melones Lake Area. The Angels Branch was completed in 1902 and included a rail bridge across the Stanislaus River at Melones (Costello 1983:53; Jackson et al. 1976). The Angels Branch was used until 1936, when the branch service was terminated (Jackson et al. 1976:180).

New Melones Archaeological District

Archaeological study of the New Melones Lake Area began in 1948 with an initial reconnaissance by Fredrickson (1949). However, the New Melones Archaeological Project (NMAP) had its formal inception with a survey conducted in 1968 (Payen et al. 1969), which is considered to be Phase I of the NMAP. Activities associated with the NMAP, which included an archaeological survey, testing, mitigation work, ethnographic research, and historic research, continued for nine more field seasons, or phases, concluding with Phase X data recovery excavations in 1981. As a part of Phase X, final archaeological reports provided a cultural resource inventory and a synthesis of the results from all ten phases of research (Moratto et al. 1986). In 1988, Moratto et al. compiled and submitted a nomination for the New Melones Lake Area cultural resources to the National Register of Historic Places as an archaeological district (Moratto et al. 1988).

The district included over 627 cultural resource sites identified during the NMAP, including archaeological sites, bedrock mortars, and historic homestead sites. The NPS returned the nomination submission in April of 1991, requesting clarifications and the submission of additional information. A final formal nomination, addressing Townsend's comments, has never been prepared, but the comments received from NPS indicate that

there is consensus that the district is significant and can be formally nominated to the NRHP if the identified problems with the nomination are addressed. The SHPO has concurred that the district is eligible for inclusion on the NRHP, so there is a consensus determination as to its eligibility.

Suggestions for resubmitting the NRHP nomination are provided in the New Melones Reservoir Cultural Resources Overview (Pacific Legacy 2008). This includes removing 90 sites from the historic district's list. The reasons for this are varied and include because the sites were destroyed or disturbed, they are not sites, they cannot be relocated, and they are outside of the New Melones Lake Area. Seventeen sites left out of the original nomination but within the New Melones Lake Area are suggested to be added to the nomination.

5.2.17 Indian Trust Assets

There are no known Indian Trust Assets or treaty rights exercised by tribes in the New Melones Lake Area, and no reservation or trust lands border on New Melones Lake. Although some treaties were made with California tribes in the Sierra Nevada in the nineteenth century, these were not ratified by the US Congress, which left native groups largely landless and without rights.

There are three tribal groups recognized by the federal government in Calaveras and Tuolumne Counties. The California Valley Miwok Tribe (formerly Sheep Ranch Rancheria) has a very small reservation (0.92 acre [0.37 hectare]) in Calaveras County. This land was purchased in 1916 as a reservation for landless Native Americans. There are two reservations in Tuolumne County. The Tuolumne Band of Me-Wuk Indians governs the 356-acre (145-hectare) Tuolumne Rancheria. The original 177 acres (70 hectares) of land for the reservation was purchased in 1910 and additional lands were subsequently acquired. The Chicken Ranch Rancheria occupies 2.85 (1.15 hectares) acres near Jamestown. Federal recognition of the Chicken Ranch Rancheria was restored as the result of a lawsuit in 1985. Both the Tuolumne Rancheria and the Chicken Ranch Rancheria have gaming operations.

There are no trends affecting Indian Trust Assets that are known to specifically involve the New Melones Lake Area. Overall trends in California and elsewhere include the assertion of tribal sovereignty, aboriginal rights and federal recognition. Many tribes were parties to unratified treaties or dispute the legal basis for the past loss of land and resources. Tribal groups, such as the Calaveras County Band of Miwok Indians, are seeking federal recognition. As these tribes become recognized, they will be sovereign nations under federal law. There have been attempts by other tribes to assert the Winters Doctrine, named for a Supreme Court decision in 1908 that held that when a reservation is established under treaty, it is implicit that sufficient water be reserved for the tribe's present and future use. Tribes in many places have also sought and succeeded in acquiring federal land in trust through transfer, exchange, or legislation. Tribes are also purchasing land for economic development. The Tuolumne Rancheria has expressed an interest in acquiring BLM-managed lands that adjoin the reservation (BLM 2006). As

individuals and tribes continue to pursue and assert rights, local communities and state and federal land and resource management practices will be affected.

5.2.18 Socioeconomic and Environmental Justice

Socioeconomic Conditions

Population. Table 5-16 presents population figures for California, Calaveras, and Tuolumne Counties and the communities closest to the New Melones Lake Area. Between 1990 and 2000, the population of all of these areas increased, and the rate of population growth was greater than the state average of 14.3 percent in Calaveras County (25.9 percent), Angels Camp (25.7 percent), and Murphys (35.9 percent). The population of Tuolumne County increased by less than the state average (12.8 percent), and Sonora's population increased by substantially less (6.5 percent) than that of the other localities in the New Melones Lake Area (US Census Bureau 1990, 2000a; California Department of Finance 2004).

Between 2000 and 2006, Angels Camp experienced the greatest population percentage increase (19.0 percent), and Sonora's population also increased by 8.6 percent, which is greater than the county average of 6.0 percent (US Census Bureau 2000a; California Department of Finance 2006c). Population increases for both counties were the result of predominantly domestic net migration (California Department of Finance 2006a).

Table 5-16: County Population Estimates 1990-2000

Location	1990	2000	Percent Change 1990-2000	2006	Percent Change 2000-2006
California[1]	29,828,473	34,098,744	14.3%	37,172,015	9.0%
Calaveras County[1]	32,470	40,890	25.9%	45,711	11.8%
Angels Camp[2]	2,409	3,004	24.7%	3,576	19.0%
Copperopolis[2]	NA	2,363	NA	NA	NA
Murphys[2]	1,517	2,061	35.9%	NA	NA
Tuolumne County[1]	48,719	54,946	12.8%	58,231	6.0%
Jamestown[2]	2,178	3,017	38.5%	NA	NA
Sonora[2]	4,153	4,423	6.5%	4,804	8.6%

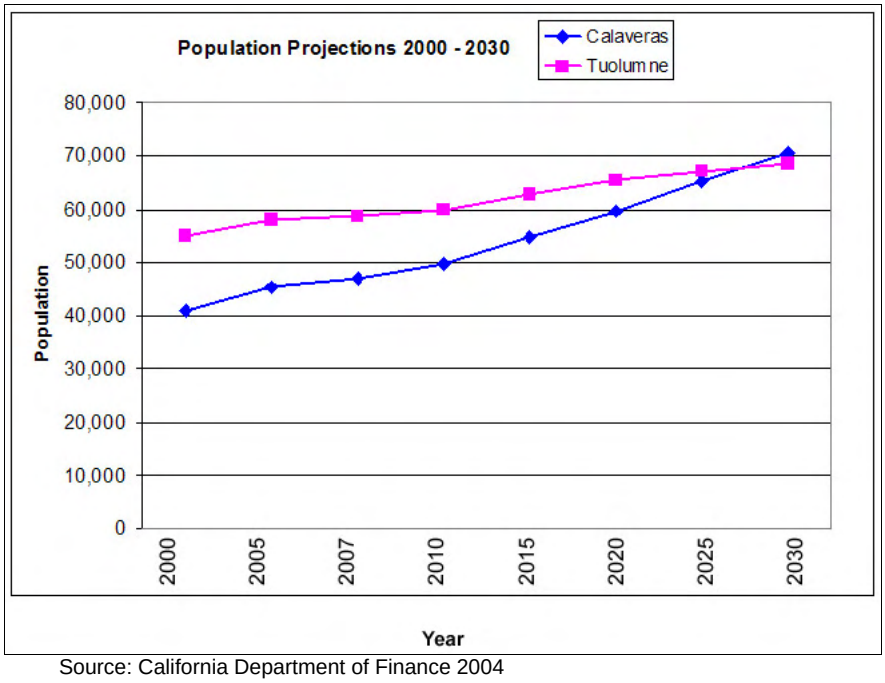
Notes: NA = Not available
Sources: [1]California Department of Finance 2004; [2]California Department of Finance 2006c; [3]US Census Bureau 1990 and 2000a

The scenic and recreational attributes of Calaveras County make the tourism and recreation industries an extremely valuable part of the economy (Calaveras County 1996). In fact, the county's 28.23 percent vacancy rate is attributed to the high number of second homes and seasonal vacation houses. This pattern is mainly visible near the county's lakes, winter sports areas, and golf courses. According to the Calaveras County General Plan estimates, in 2000, 96.2 percent of Calaveras County residents lived in the unincorporated portion of the county, and 66.1 percent of that population lived in small towns (Calaveras County 1996). Approximately 21.5 percent of Tuolumne County is privately owned, and the population density on private land is about 104 people per square mile. The population tends to be dispersed throughout small towns of mixed use

surrounded by large expanses of open space consisting of agriculture, native vegetation, and low-density development. It is Tuolumne County's policy to preserve open space between these communities. Almost 10 percent of Tuolumne County's population is in such facilities as assisted living and long-term care. The largest portion of the institutionalized population, more than 4,000 men, is in the state prison outside of Jamestown (Tuolumne County 2005).

Chart 5-1 shows projected population growth from 2000 to 2030. Chart 5-1 indicates that although the 2000 population of Calaveras County is smaller than that of Tuolumne County, by 2030 it is projected to exceed Tuolumne County's population by 2,030 (Chart 5-1). Also, as presented in Table 5-17, between 2000 and 2030, the population growth in Calaveras County (72.6 percent) is expected to exceed the state average (41.3 percent); in Tuolumne County (24.8 percent) population growth is expected to be below the state average.

Chart 5-1: Population Projections 2000-2030



Source: California Department of Finance 2004

Table 5-17: County Population Projections 2000 and 2030

County	2000	2030	2000-2030 Change	2000-2030 Percent Change
California	34,043,198	48,110,671	14,067,473	41.3
Calaveras	40,890	70,577	29,687	72.6
Tuolumne	54,946	68,566	13,620	24.8

Source: California Department of Finance 2004

Housing. Table 5-18 presents 1990, 2000, and 2006 housing data for Calaveras and Tuolumne Counties, Angels Camp, and Sonora, as well as for California. Between 1990 and 2000, the total number of housing units and the number of occupied units in Calaveras and Tuolumne Counties and Angels Camp increased by more than the state averages of 9.2 percent total and 10.8 percent occupied. In Sonora, between 1990 and 2000, the total number of housing units increased by more than occupancy, resulting in a vacancy increase of from 6.5 to 6.6 percent; both values increased by less than the state average. Between 2000 and 2006 the total number of housing units and the number of occupied units increased by a percentage similar to or above the state average. Angels Camp experienced the greatest percentage increase, with a 22.9 percent rise in the number of units and a 22.8 percent rise in the number of occupied units. Of the two cities in the New Melones area, Sonora had the lower vacancy rate at 6.6 percent, and of the two counties in the New Melones area, Tuolumne County had the lower vacancy rate at 25.9 percent. All vacancy rates shown for the New Melones area were higher than the state average of 5.9 percent in 2006 (California Department of Finance 2000b, 2006c).

Table 5-18: County Housing Estimates 1990, 2000, and 2006

Location	Year	Total	Occupied	Percent Vacant
California	1990	11,182,513	10,380,856	7.2
	2000	12,214,550	11,502,871	5.8
	Percent change 1990-2000	9.2	10.8	
	2006	13,138,670	12,367,468	5.9
	Percent change 2000-2006	7.6	7.5	
	Percent change 1990-2006	17.5	19.1	
Calaveras County				
	1990	19,153	12,649	34.0
	2000	22,946	16,469	28.2
	Percent change 1990-2000	19.8	30.2	
	2006	26,685	19,171	28.2
	Percent change 2000-2006	16.3	16.4	
	Percent change 1990-2006	39.3	51.6	
Angels Camp				
	1990	1,229	1,107	9.9
	2000	1,422	1,286	9.6
	Percent change 1990-2000	15.7	16.2	
	2006	1,747	1,579	9.6
	Percent change 2000-2006	22.9	22.8	
	Percent change 1990-2006	42.1	42.6	
Tuolumne County				
	1990	25,175	17,959	28.7
	2000	28,336	21,004	25.9
	Percent change 1990-2000	12.6	17.0	
	2006	30,071	22,298	25.9
	Percent change 2000-2006	6.1	6.2	
	Percent change 1990-2006	19.4	24.2	
Sonora				
	1990	2,084	1,949	6.5
	2000	2,197	2,051	6.6
	Percent change 1990-2000	5.4	5.2	
	2006	2,365	2,208	6.6

Table 5-18: County Housing Estimates 1990, 2000, and 2006

Location	Year	Total	Occupied	Percent Vacant
	Percent change 2000-2006	7.6	7.7	
	Percent change 1990-2006	13.5	13.3	

Sources: California Department of Finance 2000b, 2006c

As shown in Table 5-19, since 2000, housing values in Calaveras and Tuolumne Counties increased by less than the state average. The median value in Tuolumne County went up by more than that in Calaveras County, resulting in similar current median values ($221,731 and $219,990). Median housing values for the state and both counties were higher than the national average of $136,625 (US Census Bureau 2000b; Reply.com 2007a, 2007b).

Table 5-19: Median Housing Value

Location	Year	Median (dollars)
	2000	$211,500
	2007	$346,606
California	% change	63.9%
	2000	$156,900
	2007	$219,990
Calaveras County	% change	40.2%
	2000	$149,800
	2007	$221,731
Tuolumne County	% change	48.0%

Sources: US Census Bureau 2000b; Reply.com 2007a, 2007b

The 2001-2009 Housing Element of the General Plan for unincorporated Calaveras County identifies the typical residence as a single-family structure, built in 1981. Based on 2003 and 2004 actual housing costs and 2003 income limits for a family of three or four, the availability of affordable typical housing is limited. In addition, in 2003, 4.4 percent of the housing in unincorporated Calaveras County was overcrowded, whereas, 2.2 percent of housing in Angels Camp was overcrowded. Approximately 65 percent of overcrowded units were owner occupied (Calaveras County 2005).

Angels Camp is the only incorporated city in Calaveras County. The typical Angels Camp residence in 2003 was a rented single-family structure built in 1968. The city estimates that an additional 282 housing units will be needed between 2001 and 2009 to accommodate growth resulting from newly created, mainly minimum wage commercial and service jobs. Approximately 38 percent would be affordable housing for very low- and low-income families. The primary constraints to new housing development are limitations in water and wastewater infrastructure (City of Angels Camp 2006).

According to the Tuolumne County General Plan Housing Element Update, housing affordability is the primary concern of residents, particularly since the average Tuolumne

County family of four at the median income level is able to afford the purchase of a $190,000 home. The median price of a home in Tuolumne County was $220,000 in 2003, and the average price was $245,000 (Tuolumne County 2003).

Schools. In the 2005 to 2006 school year there were 29 active public schools in Calaveras County, with a total enrollment of 6,861 and student-to-teacher ratio of 21.1 (Education Data Partnership 2007a). Of these schools, six were in Angels Camp, two were in Copperopolis, and one was in Murphys (NCES 2007). The average class size in these schools was 25.4, which is lower than the state average of 27.3. A total of 7,733 students were enrolled in 44 public schools in Tuolumne County during the 2005 to 2006 school year (Education Data Partnership 2007b), 17 of which were in Sonora (NCES 2007). The student-to-teacher ratio was 18.9, and the average class size was 24.0, which was below the state average. The student-to-teacher ratio in each of the two New Melones Area counties was below the state average of 21.4 (Education Data Partnership 2007c). By 2015, enrollment in Calaveras County is projected to increase by 6.2 percent to 7,290, and in Tuolumne County enrollment is forecast to decline by 3.4 percent to 7,467 (California Department of Finance 2006b).

Employment and Income. Unemployment rates are a key indicator of the health of local economies. They reflect the ability of employers to provide the numbers and types of jobs needed by the labor force and the ability of the labor force to supply the skills and availability needed by employers (Tuolumne County 2005). Table 5-20 provides labor force and employment data in Calaveras and Tuolumne Counties and California. The unemployment rate in both Calaveras and Tuolumne Counties (5.9 and 6.1 percent) is above the state average (5.4 percent), despite increased economic diversity in these two counties (California Employment Development Department 2006; Calaveras County 1996; Tuolumne County 2005).

Table 5-20: County Employment Statistics (2005)

County	Civilian Labor Force	Employed	Unemployed	Unemployment Rate
California	17,695,600	16,746,900	948,700	5.4%
Calaveras County	20,620	19,410	1,210	5.9%
Tuolumne County	26,080	24,480	1,600	6.1%

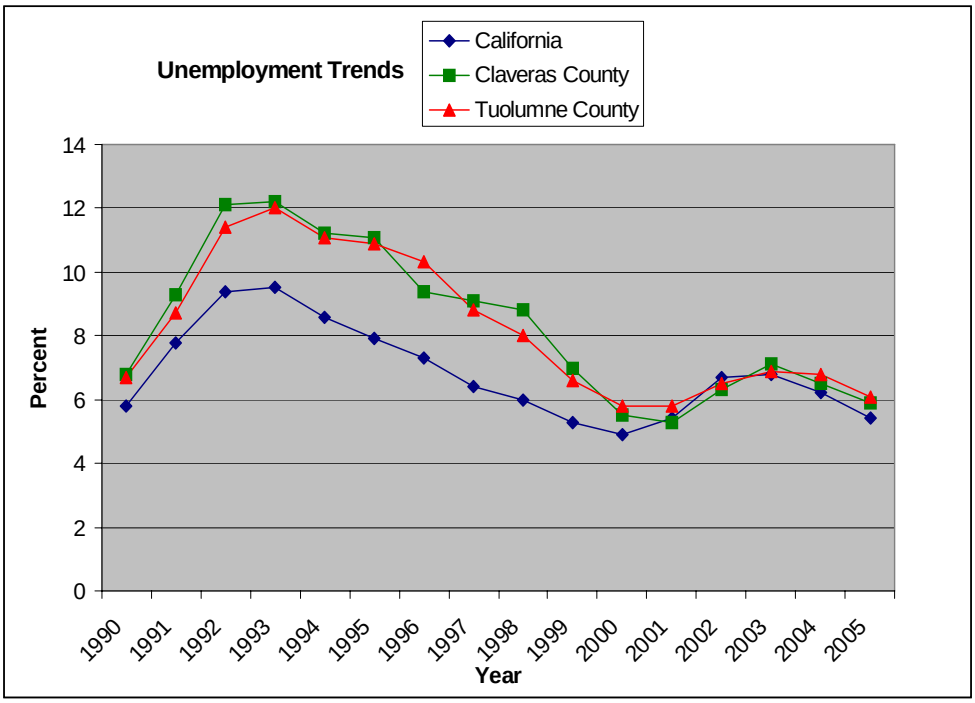
Source: California Employment Development Department 2006

As shown on Chart 5-2, since hitting a high point in 1992, unemployment in the two study area counties and in the state has been declining in general, except during the recession in 2001 through the recovery in 2004. It is during a portion of this period that the unemployment rate in the two project area counties fell below that of the state, probably due to the differing industry mix in the project area counties, as compared with the state as a whole (California Employment Development Department 2006). In addition, unemployment in the study area has increased as of the date of this RMP/EIS due to the current recession. Unemployment in Calaveras County climbed to 14.4 percent

in August 2009, and in Tuolumne County it reached 12.9 percent (California Employment Development Department 2009).

Calaveras and Tuolumne Counties are part of the Mother Lode region, which includes El Dorado, Amador, and Mariposa Counties. This area has been known historically for its minerals and timber industries, but these industries have been declining as sources of employment and income, as government, tourism and recreation, services, and construction have become increasingly important. Increases in tourism and recreation have generated additional employment in the leisure and hospitality sector and in construction. Newly created jobs in the leisure and hospitality sector are often entry-level, low-wage commercial and service positions, which may provide income to local families insufficient to afford adequate housing (City of Angels Camp 2006; Tuolumne County 2005). Increases in construction have helped to boost employment in the timber industry in the project area counties. In Tuolumne County, recent job losses have occurred in manufacturing, a sector that typically contributes more to the economy than growing sectors of government, services, and construction (Tuolumne County 2005).

Chart 5-2: Unemployment Trends



Source: California Employment Development Department 2006

Table 5-21 provides a breakdown of the project area counties' percentage employment by sector and average sector growth between 1990 and 2000 and between 2000 and 2005. In 2005 most employment in the project area counties and the state was in the services industries (80.1 percent in Calaveras County, 86.4 percent in Tuolumne County, and 81.4 percent in California); however, unlike the state, where most jobs in this group are in professional and business services, hospitality and leisure is the largest private services

sector in Calaveras and Tuolumne Counties (13.0 and 12.9 percent). The education and health services sector employs a similar number of Tuolumne County residents (12.1 percent). Government is the largest services sector in the project area counties and the state (80.1 in Calaveras County, 8.4 percent in Tuolumne County, and 81.6 percent in California). Between 1990 and 2000, the largest decline in employment in Calaveras County was in farm employment (-70.0 percent), which had been a historically stable industry in the county, with field crops, vineyards, orchards, livestock, and poultry contributing most to total gross value of production (Calaveras County 1996). However, this sector also experienced the greatest increase in employment between 2000 and 2005 at 133.3 percent, which was still below the 1990 level. The most substantial increases between 1990 and 2000 were in other services, professional and business services, and manufacturing. Between 2000 and 2005, the greatest losses in employment in Calaveras County were seen in the federal and state government sectors; and transportation/warehousing/utilities was the other major growth sector, besides farming (California Employment Development Department 2006).

Table 5-21: Employment by Sector and Growth

	California			Calaveras County			Tuolumne County		
	Percent Change 1990-2000	2005 (percent of total)	Percent Change 2000-2005	Percent Change 1990-2000	2005 (percent of total)	Percent Change 2000-2005	Percent Change 1990-2000	2005	Percent Change 2000-2005
Total, All Industries (number employed)	15.8%	15,161,100	1.8%	17.8%	9,100	12.5%	12.4%	17,870	12.0%
Total Farm	12.3%	2.5%	-8.0%	-70.0%	0.8%	133.3%	100.0%	0.5%	-50.0%
Total Nonfarm	15.9%	97.5%	2.0%	19.1%	99.3%	12.2%	11.8%	99.5%	12.8%
Total Private	16.7%	81.6%	1.7%	25.1%	72.0%	14.1%	10.1%	69.1%	10.0%
Goods Producing	-1.1%	16.1%	-7.0%	10.2%	19.1%	23.4%	-3.0%	13.1%	4.0%
Natural Resources, Mining and Construction	11.4%	6.1%	22.0%	-1.9%	14.6%	31.7%	-24.3%	7.7%	23.2%
Manufacturing	-5.4%	10.0%	-18.7%	60.0%	4.5%	2.5%	32.9%	5.4%	-15.0%
Service Providing	20.5%	81.4%	4.0%	21.1%	80.1%	9.6%	14.7%	86.4%	14.3%
Private Servicing Producing	22.8%	65.5%	4.0%	30.5%	52.7%	11.1%	14.0%	56.0%	11.6%
Trade, Transportation and Utilities	12.5%	18.6%	3.4%	8.9%	17.5%	17.8%	19.3%	16.5%	3.5%
Wholesale Trade	17.2%	4.4%	4.4%	20.0%	1.3%	0.0%	-21.1%	1.1%	33.3%
Retail Trade	8.0%	10.9%	6.0%	5.9%	12.9%	8.3%	23.3%	13.9%	-0.4%
Transportation, Warehousing, and Utilities	21.6%	3.2%	-5.8%	15.4%	3.3%	100.0%	17.6%	1.5%	35.0%
Information	47.3%	3.1%	-17.4%	7.7%	1.3%	-14.3%	15.0%	1.6%	26.1%
Financial Activities	-3.3%	6.1%	16.6%	6.9%	3.2%	-6.5%	-30.4%	3.3%	7.3%
Professional and Business Services	48.5%	14.2%	-4.1%	86.7%	6.4%	3.6%	1.1%	5.8%	16.9%
Educational and Health Services	25.2%	10.5%	13.3%	31.0%	7.5%	23.6%	51.8%	12.1%	27.6%
Leisure and Hospitality	20.7%	9.7%	10.6%	35.1%	13.0%	13.5%	8.7%	12.9%	8.5%
Other Services	17.1%	3.4%	4.9%	123.5%	4.0%	-5.3%	14.5%	3.7%	6.3%
Government	11.7%	15.9%	4.1%	6.9%	27.4%	6.9%	16.1%	30.4%	19.6%

Table 5-21: Employment by Sector and Growth

	California			Calaveras County			Tuolumne County		
	Percent Change 1990-2000	2005 (percent of total)	Percent Change 2000-2005	Percent Change 1990-2000	2005 (percent of total)	Percent Change 2000-2005	Percent Change 1990-2000	2005	Percent Change 2000-2005
Federal Government	-24.6%	1.6%	-8.7%	0.0%	1.4%	-18.8%	-33.9%	2.0%	-2.7%
State and Local Government	19.4%	14.3%	5.8%	7.4%	25.9%	8.8%	24.5%	28.4%	21.6%
State Government	16.1%	3.1%	4.4%	-22.6%	2.2%	-16.7%	-4.3%	6.1%	-1.8%
Local Government	20.4%	11.2%	6.2%	13.5%	23.7%	11.3%	39.7%	22.3%	30.1%

Source: California Employment Development Department 2006

In contrast with Calaveras County, in Tuolumne County between 1990 and 2000 total farm employment experienced the greatest increase, and between 2000 and 2005 this sector experienced the greatest decrease in employment. Educational and health services, local government, and manufacturing also experienced substantial growth (51.8, 39.7, and 32.9 percent). Between 2000 and 2005, transportation/warehousing/utilities experienced the greatest percentage growth (California Employment Development Department 2006).

The greatest absolute increase in the number of employed in Calaveras County between 2000 and 2005 occurred in government (160 workers), leisure and hospitality (150 workers), and transportation/warehousing/utilities (140 workers). In Tuolumne County the greatest absolute increases occurred in government (890 workers), educational and health services (470 workers), leisure and hospitality (180 workers), and professional and business services (150 workers) (California Employment Development Department 2006).

Table 5-22 shows the major employers in Calaveras and Tuolumne Counties. Five of the major employers in Calaveras County are in Angels Camp and one is in Murphys. Fifteen of Tuolumne County's major employers are in Sonora and two are in Jamestown. Four of the largest employers in Calaveras County are in the hospitality sector (Bear Valley Ski Area Main Office, Resort at Greenhorn Creek, Saddle Creek Lodge Resort, and Sequoia Woods Country Club), and four of Tuolumne County's largest employers are in the hospitality sector (Black Oak Casino, Dodge Ridge Ski Resort, Chicken Ranch Bingo and Casino, and Lair of the Bear).

According to employment projections, between 2002 and 2012, total nonfarm wage and salary employment in the Mother Lode region is expected to grow by about 1.5 percent annually (about 9,000 jobs) between 2002 and 2012, slightly less than the statewide growth rate of 1.8 percent. Approximately 64 percent of new nonfarm wage and salary jobs are forecast to occur in government (32 percent), leisure and hospitality (19 percent), and construction (13 percent). Construction is expected to be the fastest growing major industry sector (at an annual growth rate of 3.0 percent), and information, educational and health services, and professional and business services are also forecast to grow at a

Table 5-22: Major Employers in Calaveras and Tuolumne Counties

Calaveras County				Tuolumne County			
Employer Name	**Location**	**Industry**	**Number of Employees**	**Employer Name**	**Location**	**Industry**	**Number of Employees**
Bear Valley Ski Area Main Office	Bear Valley	Skiing Centers and Resorts	250-499	Corrections Department	Jamestown	State Government-Correctional Institutions	1,000-4,999
Forestry and Fire Protection	San Andreas	Government-Forestry Services	250-499	Black Oak Casino	Tuolumne	Casinos	500-999
Mark Twain St. Joseph's Hospital	San Andreas	Hospitals	250-499	Sonora Regional Medical Center	Sonora	Emergency Medical and Surgery Service	500-999
Mountain Machining	Angels Camp	Machine Shops	250-499	Dodge Ridge Ski Resort	Pinecrest	Skiing Centers and Resorts	250-499
Human Resources Council	San Andreas	Social Service and Welfare Organizations	100-249	MRL Industries, Inc.	Sonora	Semiconductor-Manufacturers Equipment/Supplies (Wholesale)	250-499
Ironstone Vineyards	Murphys	Wineries	100-249	National Audubon Society	Sonora	Environmental Conservation/ Ecological Organization	250-499
Mark Twain Convalescent Hospital	San Andreas	Hospitals	100-249	Tuolumne General Hospital	Sonora	Hospitals	250-499
Rite of Passage ATCS	San Andreas	Schools	100-249	Tuolumne General Hospital SNF	Sonora	Nursing and Convalescent Homes	250-499
Big Trees Market	Arnold	Grocers-Retail	50-99	Wal-Mart	Sonora	Department Stores	250-499
Bret Harte High School	Altaville	Schools	50-99	Avalon Care Center	Sonora	Nursing and Convalescent Homes	100-249

Table 5-22: Major Employers in Calaveras and Tuolumne Counties

Calaveras County				Tuolumne County			
Employer Name	**Location**	**Industry**	**Number of Employees**	**Employer Name**	**Location**	**Industry**	**Number of Employees**
Calaveras County Human Services	San Andreas	County Government-Social/Human Resources	50-99	Chicken Ranch Bingo and Casino	Jamestown	Bingo Games	100-249
Calaveras County Road Department	San Andreas	Grading Contractors	50-99	Columbia College	Sonora	Schools-Universities and Colleges Academic	100-249
Calaveras County Sheriff	San Andreas	Sheriff	50-99	Diestel Turkey Ranch	Chinese Camp	Poultry Processing Plants	100-249
Calaveras County Water	San Andreas	Water and Sewage Companies-Utility	50-99	Hetch Hetchy Water and Power	Moccasin	Water and Sewage Companies-Utility	100-249
Calaveras Lumber	Angels Camp	Lumber-Retail	50-99	Lair of the Bear	Pinecrest	Camps	100-249
Calaveras Public Works Department	San Andreas	Grading Contractors	50-99	Pak 'N Save Foods	Sonora	Grocers-Retail	100-249
Calaveras Works and Human Services	San Andreas	Government Offices-County	50-99	Pine Mountain Lake Association	Groveland	Associations	100-249
Foot Hill Village Lodge and Inn	Angels Camp	Retirement Communities and Homes	50-99	Sierra Pacific	Sonora	Lumber Manufacturers	100-249
Jenny Lind Elementary School	Valley Springs	Schools	50-99	Sierra Pacific Industries	Chinese Camp	Sawmills	100-249
Longs Drugs	Valley Springs	Pharmacies	50-99	Sonora School District	Sonora	Schools	100-249

Table 5-22: Major Employers in Calaveras and Tuolumne Counties

Calaveras County				Tuolumne County			
Employer Name	**Location**	**Industry**	**Number of Employees**	**Employer Name**	**Location**	**Industry**	**Number of Employees**
Mark Twain Elementary School	Angels Camp	Schools	50-99	Sonora Union High School	Sonora	Schools	100-249
Mar-Val Food Stores	Valley Springs	Grocers-Retail	50-99	Tuolumne County Human Services Agency	Sonora	County Government-Social/Human Resources	100-249
Resort at Greenhorn Creek	Angels Camp	Resorts	50-99	Tuolumne County Sheriff	Sonora	Sheriff	100-249
Saddle Creek Lodge Resort	Copperopolis	Hotels and Motels	50-99	Tuolumne County Social Services	Sonora	County Government-Social/Human Resources	100-249
Sequoia Woods Country Club	Arnold	Restaurants	50-99	USFS	Groveland	Government-Forestry Services	100-249

Sources: California Employment Development Department 2007a, 2007b

faster rate than the county average (California Employment Development Department 2007c).

Both counties' general plans indicated that low-income levels and low-paying local jobs have resulted in residents commuting outside the area for employment and have led to a decline in the affordability of housing to local residents. In 2004, per capita personal income in Calaveras and Tuolumne Counties was $27,480 and $26,578. The state average of $35,219 was about 22 percent higher than income in Calaveras County and 24 percent higher than in Tuolumne County (BEA 2006). Income is also depressed in this region due to the high population of retirees that reside in the area. Retirees on fixed incomes have limited funds to spend (in the form of tax increases) for infrastructure improvements or other community benefits (Holsapple 2009).

Taxes and Payments in Lieu of Taxes (PILT). Recreation at New Melones Lake contributes to tax revenues in Calaveras and Tuolumne Counties and the communities surrounding it by drawing visitors who pay sales and use taxes and transient occupancy taxes. Those attracted to the area for recreation or employment who also purchase property would contribute to the counties' property tax revenues. The US Department of the Interior provides PILT to local governments to help offset losses in property taxes due to nontaxable federal lands. Taxes, including PILT, are the primary revenue support for local police and fire protection, roads, and other infrastructure.

The sales and use tax rate in Tuolumne and Calaveras Counties is 7.250 percent. The property tax rate in Calaveras County in the area surrounding New Melones Lake is an average of 1.0264 percent (Calaveras County 2007a). Sales tax revenue for Calaveras County during the 2005 to 2006 fiscal year totaled $2,587,619 (Calaveras County 2007b), and property tax revenues were $71,622,000 for unincorporated Calaveras County (Calaveras County 2007c). The property tax rate in Tuolumne County is roughly 1.04182 percent. Sales tax revenue in Tuolumne County for the 2005 to 2006 fiscal year was $3,156,000, and $13,839,000 in property tax revenue went to Tuolumne County's General Fund over this period (Robertson 2007).

Transient occupancy taxes are one way local governments collect revenues from visitors. They are a good indicator of travel activity because almost all of these sales are made to travelers. In 2005, transient occupancy tax revenue in Tuolumne County totaled $1,271,273 and in Sonora $202,790 (Robertson 2007). Transient occupancy taxes accounted for $288,222 in revenue in Calaveras County (Calaveras County 2007a) and $739,177 in Angels Camp for the 2005 to 2006 fiscal year (City of Angels Camp 2007).

The formula used to compute the payments is based on population, receipt sharing payments, and the amount of federal land within an affected county. PILT payments in 2006 in Calaveras County totaled $70,775, and in Tuolumne County total PILT payments were $739,215. In Calaveras County these payments covered 140,127 acres of federal land, 13 percent of which (18,213 acres) was Reclamation land. In Tuolumne County, federal lands totaled 1,091,844 acres, 0.8 percent of which (8,260 acres) was Reclamation land. Approximately 0.6 percent of federal land statewide was Reclamation land. Between 2000 and 2006, PILT payments in Calaveras County declined by 18.2 percent

despite a 2.8 percent increase in federal lands; whereas, in Tuolumne County and the state, PILT payments increased by 5.2 and 47.4 percent. Over this period the federal acreage in Tuolumne County did not change, but the state average increased by 1.3 percent. The acreage of Reclamation lands increased in Calaveras County by 87 acres, remained unchanged in Tuolumne County, and increased by 213 acres statewide between 2000 and 2006 (US Department of the Interior 2007).

Recreational Revenues of the New Melones Reservoir. The projected annual benefits presented in the economic impact study prepared in 1978 for the New Melones Reservoir were $20,300,000 (based on 1975 price levels). This would be equivalent to the 2007 dollar value of $74,907,749. The study estimated that 10 percent of this annual benefit would be from general recreation and fishery enhancement. The average revenue generated, between 2005 and 2007, from recreational use fees and marina franchise fees is $341,675 (Laird 2009a). The recreation uses fees account for approximately 75 percent of the total recreational revenue fees.

Environmental Justice

In order to comply with EO 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations, data was compiled concerning the ethnic composition and income and poverty levels of the two New Melones Lake Area counties. At the time of the 2000 Census, the percentage of minorities in the census tracts surrounding New Melones Lake was 11.9 percent, and the percentage of any race that was considered Hispanic was 8.3 percent (US Census Bureau 2000a).

Table 5-23 presents ethnicity data for Calaveras County, and Table 5-24 presents ethnicity data for Tuolumne County. The minority population constitutes approximately 14.3 percent of the population of Calaveras County. Similar to Tuolumne County, the Hispanic population forms the greatest percentage of the minority population (7.0 percent). The percentage of minorities in Calaveras County has increased since 2000 and is projected to continue to increase, as is the percentage of minorities that is made up of Hispanics (California Department of Finance 2004). Based on Census data, the percentage of minorities in the area closest to New Melones Lake is lower than the Calaveras County average.

Table 5-23: Population Ethnicity Estimates for Calaveras County

Year	White	Hispanic	Asian	Pacific Islander	Black	Native American	Multi-Race	% Non-White	Total
2000	35,685	2,879	367	41	360	652	906	12.7%	40,890
Percent	(87.3%)	(7.0%)	(0.9%)	(0.1%)	(0.9%)	(1.6%)	(2.2%)		
2006	39,555	3,651	433	41	499	1,002	985	14.3%	46,166
Percent	(85.7%)	(7.9%)	(0.9%)	(0.1%)	1.1%	(2.2%)	(2.1%)		

Table 5-23: Population Ethnicity Estimates for Calaveras County

Year	White	Hispanic	Asian	Pacific Islander	Black	Native American	Multi-Race	% Non-White	Total
2030	55,981	7,954	1,076	41	1,226	3,042	1,257	20.7%	70,577
Percent	(79.3%)	(11.3%)	(1.5%)	(0.1%)	1.7%	(4.3%)	(1.8%)		

Source: California Department of Finance 2004

As shown in Table 5-24, ethnic minorities are estimated to make up 16.3 percent of the current population of Tuolumne County, which is a slightly higher percentage than in Calaveras County. As for Calaveras County, the Hispanic population forms the greatest percentage of the minority population (8.5 percent of the total population). The percentage of minorities has increased since 2000 and is projected to continue to increase, as is the percentage of minorities that is made up of Hispanics (California Department of Finance 2004). Based on census data, the percentage of minorities in the area closest to New Melones Lake is lower than the Tuolumne County average.

Table 5-24: Population Ethnicity Estimates for Tuolumne County

Year	White	Hispanic	Asian	Pacific Islander	Black	Native American	Multi-Race	Percent Non-White	Total
2000	46,674	4,540	421	93	1,159	948	1,111	15.1%	54,946
Percent	(84.9%)	(8.3%)	(0.8%)	(0.2%)	2.1%	(1.7%)	(2.0%)		
2006	48,867	4,952	518	93	1,191	1,476	1,265	16.3%	58,362
Percent	(83.7%)	(8.5%)	(0.9%)	(0.2%)	2.0%	(92.5%)	(2.2%)		
2030	54,191	6,526	863	93	1,269	3,909	1,715	21.0%	68,566
Percent	(79.0%)	(9.5%)	(1.3%)	(0.1%)	1.9%	(5.7%)	(2.5%)		

Source: California Department of Finance 2004

This trend toward a larger percentage minority population, with Hispanics being the largest minority, reflects the state trend; however, the proportion of minorities in the New Melones Lake Area counties is much lower than the state average, which has been above 50 percent since 2000. In 2000, approximately 52.9 percent of the state population was minority, with 32.6 percent Hispanic; and in 2006 about 57.8 percent of California's population was minority, with 36.4 percent Hispanic. By 2030 the state is projected to have a 70.5 percent minority population, and 46.8 percent of the population is forecast to be Hispanic (California Department of Finance 2004).

The US Census Bureau uses a set of income thresholds that vary by family size and composition to determine which families are living in poverty. If a family's total income is less than its threshold, then that family, and every individual in it, is considered to be

living in poverty. Poverty thresholds do not vary geographically, but they are updated annually for inflation using the Consumer Price Index. For individuals who do not live with family members, their own income is compared with the appropriate threshold (US Census Bureau 2004). According to the US Census Bureau, the poverty threshold in 2004 was $9,973 for an individual and $19,971 for a family of four. Table 5-25 shows estimated median household income and poverty levels for Calaveras and Tuolumne Counties and for the state. According to the US Census Bureau, the percentage of the populations of Calaveras and Tuolumne Counties at income levels below the poverty threshold was lower than the state average of 13.2 percent, with 9.3 and 11.6 percent, respectively. The median household income for these two counties was also below the state average (US Census Bureau 2006).

Table 5-25: Median Household Income and Poverty, 2004

State/County	Median Household Income	Number in Poverty	Percent in Poverty
California	49,894	4,681,645	13.2
Calaveras County	46,052	4,323	9.3
Tuolumne County	41,067	6,069	11.6

Source: US Census Bureau 2006

According to the 2000 Census, within the census tracts surrounding the New Melones Lake Area, the percentage of families below the poverty line averaged approximately 9.3 percent, higher than the Calaveras County average of 8.7 percent and the Tuolumne County average of 8.1 percent. The average percentage of individuals below the poverty line in the census tracts surrounding the New Melones Lake Area was 12.8 percent, which was higher than the Calaveras County average of 11.8 percent and the Tuolumne County average of 11.4 percent (US Census Bureau 2000b).

5.2.19 General Recreation

The New Melones Lake Area receives approximately 800,000 visitors a year (Reclamation 2007d). Most visitor use occurs within the designated developed recreation areas of Glory Hole and Tuttletown. Both areas have been developed and managed in conformance with the Master Plan (1976). In addition to its magnificent scenery, the lake offers an array of activities, such as camping, hiking, wildlife viewing, rock climbing, mountain biking, horseback riding, fishing, boating, water skiing, wake boarding, using personal watercraft, sailing, swimming, kayaking, canoeing, picnicking, spelunking, and operating floatplanes and radio-controlled aircraft. Boat ramps, RV dump stations, a visitor center, and trails are other recreation amenities.

A 2007 telephone and on-site survey of residents in the New Melones Lake Area yielded data on visitor use trends. Most recreationists visiting the New Melones Lake Area come from Tuolumne (20.2%), Santa Clara (11.6%), and Stanislaus (10.1%) counties. Based in part on this information, the telephone survey of users was stratified as follows (Reclamation 2008):

- Tuolumne County – 30%

- Santa Clara – 16%
- Stanislaus – 15%
- Calaveras County – 13%
- Contra Costa County – 13%
- San Joaquin – 13%

During the onsite survey, users were asked how many times they visited the New Melones Lake Area in the past 12 months. The mean number of visits was 13, while the median number was only 6. This suggests a wide distribution in use patterns. Nearly one quarter of the respondents visiting the area had more than 15 visits in the past year. A large number of users (44%), however, had visited the area less than 4 times in the past year (Reclamation 2008).

The number of days spent visiting the area is as follows:

Less than 1 day – 30.5%

1 day – 28.6%

2 to 4 Days – 37.1%

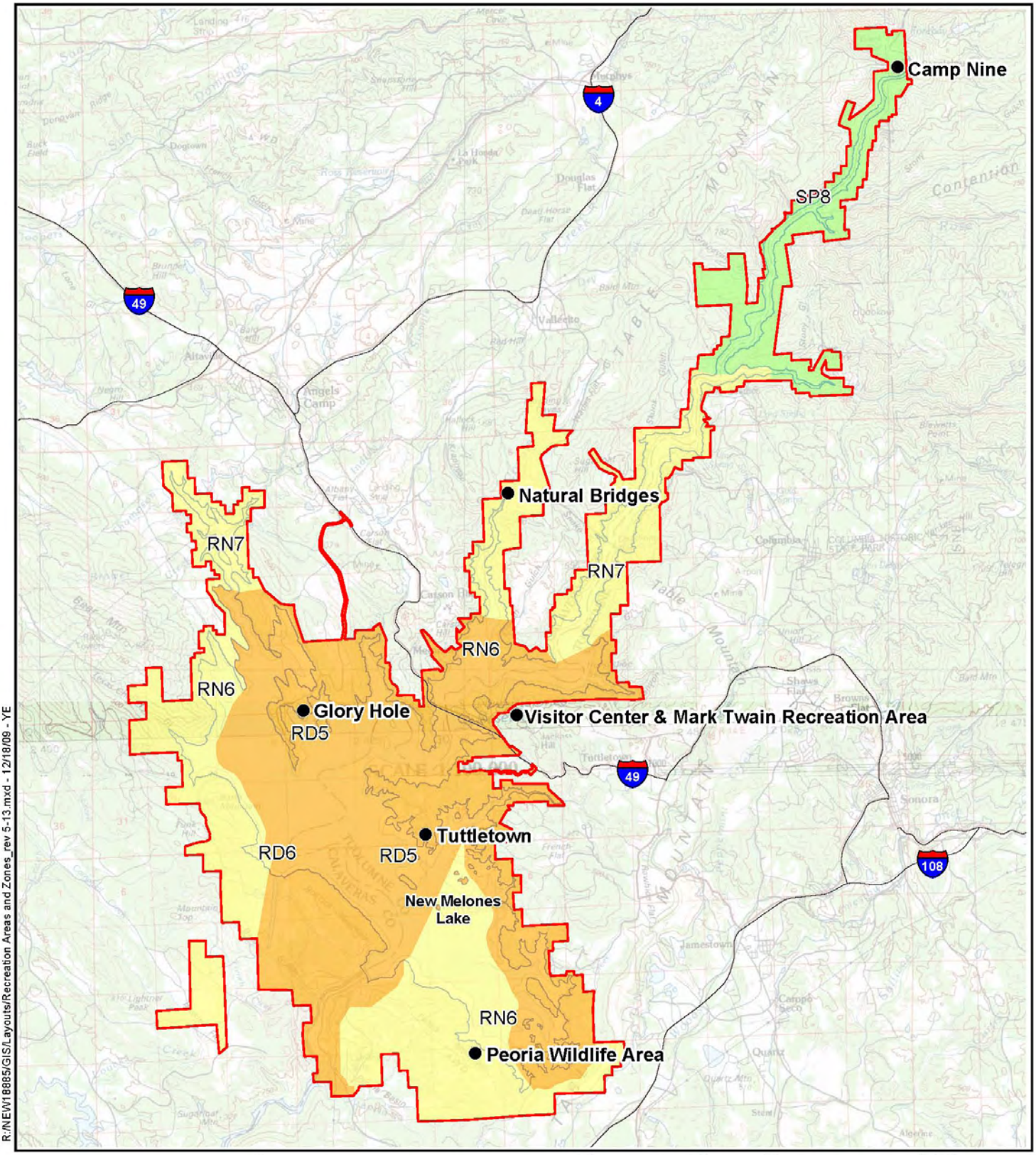
5+ Days – 3.8%

The mean time spent at New Melones was 1.5 days and the median was 1 day (Reclamation 2008).

Figure 5-13 shows recreation areas at New Melones Lake. Within the developed recreation areas, Reclamation manages five fee campgrounds. Campsites are available for reservation through the National Recreation Reservation Service. Camping is permitted only in the designated campgrounds; no shoreline camping is allowed. Each campground also has its own self-registration/self-pay station. The current capacity is 305 developed camping sites for the primary use season, two group campgrounds, 470 parking spaces year-round, 125 picnic sites, and a group picnic area. Each camping site contains a picnic table, fire pit, and grill. Each campground has water spigots, restroom facilities, and hot showers. Most of the camping and picnicking infrastructure on the lake is aging. Historically, recreation occurred on a seasonal basis, with significantly fewer visitors during colder months. With visitation in the non-peak seasons increasing, pressure on facilities and infrastructure is also increasing. Three sites in the campground have been updated to meet the Americans with Disabilities Act standards. Almost all sites are available by reservation and are otherwise available on a first come, first served basis.

Concessions

Reclamation uses concessionaire agreements to achieve needed recreational support services, programs, and facilities and as a means for disseminating public use information. The primary concessionaire at the New Melones Lake Area runs the New Melones Lake Marina at the Glory Hole Management Area. The marina provides rentals



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WROS INVENTORY SCALE

1	2	3	4	5	6	7	8	9	10	11
U		S		RD		RN		SP		P

U - Urban Recreation
S - Suburban Recreation
RN - Rural Natural Recreation
RD - Rural Developed Recreation
SP - Semi Primitive Recreation
P - Primitive Recreation

WROS Categories

U
S
RD
RN
SP
P

Recreation Areas and Zones

N

0 2
Miles

New Melones Lake, California
Central California Area Office

Figure 5-13

of houseboats, patio boats, fishing boats, and personal watercraft. There are 20 rental houseboats and 38 private houseboats docked at the marina, and an additional 50 private houseboats are docked at mooring balls in the cove. The marina also rents boat slips and runs a store offering food, beverages, and fishing tackle. The marina also has such amenities as a boat fueling station, sewage pump-out service, propane sales, and baggage cart service.

Reclamation supports concessionaire agreements with private enterprises to achieve needed recreational support services, programs, and facilities and to disseminate Reclamation information (Reclamation 1995). All concessionaire contracts include explicit measures related to the notice and dissemination of public information, communications equipment necessary in the event of emergencies, medical emergency provisions, and spill emergency response measures.

The marina concessionaire at the New Melones Lake Area holds a County Non-Community Water Permit for the marina's water system and a Calaveras County Store Permit for the convenience store at the marina (Reclamation 1995). The concessionaire also holds a fuel permit for the convenience store and a State of California license for selling beer and wine, which includes a federal tax stamp from the Federal Bureau of Investigation.

White-water boating has occurred during ideal lake conditions. The Stanislaus River, when it is not inundated by New Melones Lake, offers generally forgiving to fairly difficult rafting runs. Depending on seasonal water fluctuations, commercial rafting companies may offer organized guided raft trips down the river. Most of the white-water boating consists of organized permittees that provide day-long, guided raft trips; however, several individuals also kayak and raft the lake and river.

Recreational gold panning is an unregulated activity and is allowed throughout the area.

Unpermitted fishing guide services and an unpermitted float plane school are also found in the area. Reclamation is seeking voluntary compliance of these unpermitted commercial services with 43 CFR, Parts 423 and 429, and other directives. Per 43 CFR, Part 429, those staging commercial activities and events and occupying or using federal land must obtain a land use authorization, such as a right of use permit. Permitted uses are listed in Section 6-10.

Licensees. Reclamation licenses the Sonora Radio-Controlled Flyers and New Melones Water Skiers, Inc., to operate in the New Melones Lake Area. The licenses allow these nonprofit organizations to operate on Reclamation land with the understanding that they operate the water ski course (located in the South Bay Planning Area) and radio-controlled airplane strip (located downstream of the dam) in a way that is fully open to the public.

CAL FIRE has a lease agreement to run Baseline Conservation Camp on approximately 66 acres (25 hectares) of Reclamation land. The facility is self contained and has its own water treatment plant and power source. In this case, CAL FIRE uses Baseline

Conservation Camp inmates to provide New Melones with such services as fire fuels reduction in exchange for housing its facility on Reclamation land. The benefits of this agreement to the New Melones Lake Area include fire suppression, recreation area maintenance, and wildlife habitat enhancement.

5.2.20 Facilities, Land Use, and Management Areas

Facilities

The New Melones Lake Area is in a rural area among the foothills of the west slope of the Sierra Nevada. Altaville, Angels Camp, Columbia, Springfield, Sonora, Copperopolis, and Jamestown are the closest towns.

Each year, approximately 800,000 visitors take advantage of the various recreational opportunities at the New Melones Lake Area (Reclamation 2007d). Facilities at New Melones Lake are found at Glory Hole and Tuttletown Recreation Areas, the visitor center, and undeveloped areas. The types of facilities include access and parking facilities, day use facilities, overnight facilities, and support facilities. There are other miscellaneous facilities, such as amphitheater, trailhead parking areas, and playgrounds. The types and number of facilities at the New Melones Lake Area are identified in Appendix I.

Developed Recreation Areas. Reclamation designates developed recreation areas for recreational use and has developed them in conformance with the Master Plan (Reclamation 1995). Glory Hole Recreation Area is in Calaveras County in the mid-basin area and is accessed from Highway 49 via Whittle Ranch Road. The recreation area is composed of the main portion (which includes the large peninsula extending into the reservoir), the New Melones Lake Marina, and Angels Creek (which is north of the main area).

The Tuttletown Recreation Area is in Tuolumne County in the mid-basin area and is accessed from Highway 49 via Reynolds Ferry Road (Reclamation 1995). The recreation area is on a large peninsula extending into the reservoir.

The Mark Twain Recreation Area includes the administration area and visitor center, which is in Tuolumne County near the Highway 49 Stevenot Stanislaus River Bridge (Reclamation 1995). It is accessed from Highway 49 along and adjacent to the old Highway 49 road via Melones Court and Studhorse Flat Road. The area is on the gradual incline of the north-facing side of Jackass Hill. In addition to housing Reclamation's administration and maintenance operations facilities, the area also has a visitor center and restrooms and informal lake access.

The Dam Overlook is in Tuolumne County and is accessed via Peoria Flat Road from Highway 108/120 (Reclamation 1995). The area contains viewing shelters, a restroom, and a parking lot. The view from the overlook is on the west side of New Melones Dam, the powerhouse, and the Stanislaus River. The overlook facility was built to enable

public viewing for the dam and powerhouse construction. Once dam construction was completed, the Dam Overlook became obsolete and was closed to the public.

Reclamation constructed playgrounds in camping areas shortly after the lake was filled. The playgrounds will be removed because of safety concerns.

Undeveloped Recreation Areas. Undeveloped recreation areas are sites that were planned for future development in the Master Plan but remained undeveloped or with minimum basic facilities. These areas are presently used, Reclamation having designated them for dispersed recreational use and other uses, such as wildlife management. Various facilities are found in the nine undeveloped recreation areas identified in Appendix I. Vehicles with car-top boats have access to the lake at the Mark Twain undeveloped lake access, which is the old Highway 49 route. In this area, canoes, kayaks, and small boats with a maximum of ten horsepower motors are allowed to be hand launched; trailered launching is not permitting. Parrotts Ferry undeveloped lake access, also a former roadway, was at one time open to trailered boat launching/vehicle access but is now open only for foot traffic and hand launching. Both former roadways have deteriorated and are in disrepair because of shoreline erosion undercutting the road and hillside. The Old Melones area is now closed.

Most of the facilities in the developed areas meet current recreation demands from the public, except when the water level is high and during peak visitor periods. Parking areas are inundated when the water level is high, reducing parking space. During peak visitor periods, there is a lack of ADA-accessible facilities, reservable group picnic spots, fish-cleaning stations, pay phones, and showers at the campgrounds. High water level, day use parking, parking at the marina, and overflow parking for campers is also lacking.

The undeveloped areas do not have facilities to support current or future levels of visitor activities. Undeveloped areas have limited parking, restroom, and refuse facilities and lack vehicle barriers, fencing, signs, and visitor information boards.

WROS Classification

Reclamation recognizes that water recreation management involves a thorough understanding of the potential of water resources, current and future visitor uses, the types of experiences that visitors seek, current recreation demand and supply, land management activities, and other potential uses of the reservoir area environment.

Research has shown that recreationists not only seek to participate in recreation activities, but also seek specific recreation settings in order to enjoy a special kind of recreation experience and subsequent benefits. These four components (i.e. activities, settings, experiences, benefits) constitute a recreation opportunity (Reclamation 2004).

Recreation settings are characterized and organized into categories called a Water Recreation Opportunity Spectrum (WROS), which is a tool used to understand the type and locations of six types of water-related recreation opportunities, otherwise known as WROS classes (Reclamation 2004). The six WROS classes range across the following

categories, in order, from the most developed recreational setting to the least developed: Urban, Suburban, Rural Developed, Rural Natural, Semi Primitive and Primitive (Reclamation 2004). Table 5-26 describes the attributes that determine the different categories.

Table 5-26 WROS Attributes

Physical Attributes	Managerial Attributes	Social Attributes
Degree of development	Degree of management presence	Degree of visitor presence
Sense of closeness	Degree of public access facilities	Degree of non-recreational use
Degree of resource modification	Degree of developed recreation facilities	Degree of diverse recreation
Distance to development on or adjacent to a water resource	Degree of visitor services and conveniences	Degree of visitor comforts
Degree of natural ambience		Degree of solitude/remoteness

Source: Reclamation 2004

Within the eighteen New Melones Lake Area management areas there are three WROS classes: Rural Developed, Rural Natural, and Semi Primitive. The primary characteristics of these three WROS classes are:

- **Rural Developed:** A Rural Developed WROS area is beyond a metropolitan area and the suburban ring of development. Rural Developed areas may serve as "bedroom" communities for urban areas and may contain working farms and ranches. Towns and primary road networks are common. Development will be prevalent and common, yet the setting has a pastoral sense because of an interspersing of forests, water resources, hills, valleys, canyons, wetlands, open spaces, and agricultural land uses. Natural appearing shoreline edges are common, although various water controls or other structures are also common. Recreation management is prevalent and common but not as extensive as in an urban setting (e.g., personnel, rules, facilities, signs, services, conveniences, security). Recreation use, diversity, socialization, concentration, sense of security, and conveniences are common but less so than in a developed suburban or urban setting. The sights, sounds, and smells of recreation and non-recreation use are common, yet interspersed with locations and times when a sense of tranquility and escape from everyday challenges may be experienced by the urbanized visitor. Examples of Rural Developed areas may include areas with country estates, second homes and cabins, dams, power stations, primary and secondary roads, communication lines, resorts, marinas, small communities, full-service campgrounds, county and state parks, farms, ranches, and small commercial and industrial establishments (Reclamation 2004).
- **Rural Natural:** A Rural Natural WROS area is a considerable distance from metropolitan areas and communities. Natural features are predominant on the landscape, and the presence of development is occasional or infrequent. Agriculture, tourism, and outdoor recreation are often primary industries. Rural

Natural areas are often large enclaves of public lands and waters. Natural resources dominate the landscape. The sights, sounds, and smells of development are infrequent. The water resources are bordered by natural appearing settings. Water controls or other structures are occasional along the shoreline. Management is occasionally noticeable in the form of patrols, facilities, signage, conveniences, and full services. Visitors desire a sense of tranquility and escape from their daily routine. Opportunity for visitors to see, hear, and smell nature is prevalent and common, as are occasions to enjoy periods of solitude. Recreation use, diversity, socialization, concentration, sense of security, and conveniences are periodic and occasional. Examples of a Rural Natural area might include unincorporated rural areas with occasional secondary and unpaved roads, small cabins, single residences, farms and ranches, rustic campgrounds, rural county and state parks, power lines, small stores and fuel services, and areas often bordering or surrounded by large expanses of public lands and waters (Reclamation 2004).

- **Semi Primitive:** A Semi Primitive WROS area is a large expanse of natural resources that is far from any city or metropolitan area and a considerable distance from small communities, subdivisions, or developments. Natural resources dominate the landscape. Development is minor and the sights and sounds of human activity are few, but may include such evidence of human activity as distant farming operations, power lines, livestock, small buildings, old roadways, historic structures, and historic logging or mining. These water resources are often within large expanses of public lands and waters. Management, in the form of patrols, facilities, and signage, is seldom noticeable and the visitors are expected to have the equipment and skills to be able to navigate and enjoy this setting. Visitors desire a sense of tranquility and escape from their daily routine. Facilities are rustic and blend well into the setting. Resource protection is very important. Opportunity for visitors to see, hear, and smell nature is wide-spread. Visitors sense solitude and remoteness. Examples of Semi Primitive settings are large expanses of state and federal lands and waters that are commonly designated as a wild and scenic river, wilderness, backcountry lake, headwater, marine reserve, roadless area, or other type of state, federal, or international protected area (Reclamation 2004).

Of the three WROS classes present at the New Melones Lake Area, rural developed areas offer the most developed setting where man-made conveniences are common, while semi-primitive areas offer the least developed setting where visitors experience few sights and sounds of human activity and opportunities for remoteness and solitude. Rural natural areas allow visitors to experience a natural landscape with some opportunities to experience both solitude and man-made conveniences.

At the New Melones Lake Area, there are 17,372.87 acres classified as Rural Developed, 10,686.58 acres classified as Rural Natural, and 413.55 acres are classified as semi-primitive. Rural developed settings dominate and opportunities to recreate in semi-primitive settings are rare.

Management Areas

Camp Nine Management Area (WROS description is Semi Primitive). This area is in Calaveras and Tuolumne Counties and is the northernmost of the planning areas and recreation areas along the upper Stanislaus arm. Although it is the most remote and is farthest from the campgrounds, marina, and boat launches, the Camp Nine Management Area experiences intensive use because it is a favorite recreation area for white-water rafters, kayakers, and swimmers. Before the dam was completed in 1979, the Old Camp Nine Bridge was the launch site for rafters, who would travel nine miles to Parrotts Ferry Bridge, where they would take out their boats. This area was once thought of as the best run for intermediate-skill rafters in California. After the dam was constructed, the general assumption was that the Old Camp Nine bridge would be inundated and many of the aquatic opportunities would be lost. However, due to drought and low water levels, the bridge is often exposed. Bridge jumping is also a popular activity, but recently a gate has been put up to restrict access to the Old Camp Nine Bridge, and signs warning against bridge jumping have been posted. Due to safety and public health concerns, the Old Camp Nine Bridge is planned for deconstruction in 2008/2009.

Access to the Camp Nine Management Area is limited, with the only practical route being the unimproved Camp Nine Road, which originates near the town of Vallecito. Development is minor, consisting of an informal parking area, footbridge, hiking trails, and one vault restroom. Opportunities in this area are for more adventurous visitors. Recreation opportunities and development is minor, consisting of a hiking trail to the cultural sites at Clarks Flat. Low-impact activities, such as wildlife viewing, hiking, and stream fishing, are encouraged.

Stanislaus River Canyon Management Area (WROS description is Semi Primitive) is in Tuolumne and Calaveras Counties, just south of the Camp Nine Planning Area. Power boat users regularly visit the area, although the area upstream of the confluence of the upper Stanislaus fork and the south fork of the Stanislaus is a designated no wake zone. During years of extreme drought when the lake level is low, white-water rafters visit this area. As such, this planning area is subject to intensive use. This area is a significant cave resource area, with numerous caves on both sides of the river. Developed recreation opportunities in this planning area are limited, and management is primarily focused on preserving sensitive resources. However, spelunkers explore many of the caves, an activity that is difficult to manage and for which little official data regarding use levels exists. To protect sensitive resources, such as rare or listed animal species and cultural resources, some caves have been gated. No facilities have been developed in this area.

Parrotts Ferry Management Area (WROS description is Rural Natural) is in Tuolumne County, adjacent to Parrotts Ferry Road. The area is very steep, except for two small flat areas along the road. Before the dam was constructed, Parrotts Ferry was the take-out location for rafters who started nine miles upstream at the Old Camp Nine Bridge. The old road was heavily used as lake access for boat launching, but the road and retaining wall were deemed safety hazards and vandalism was a problem. As a result, the road was closed to public access several years ago. Recreationists use the area for fishing, boating, and suction dredge gold mining. No facilities have been developed.

Carson Management Area (WROS description is Rural Developed) is in both Tuolumne and Calaveras Counties on the eastern shoreline of the lake. Low slopes in the western part of this planning area make this area particularly susceptible to variable water levels, while steep slopes on the eastern side make access to the lake from land difficult. Horseshoe Bend, on the eastern side of this planning area, is a well-known fishing cove. This area was not identified in the Master Plan (1976) and has no facility development. It is heavily transited by boaters traveling between the main body of the lake and the Stanislaus River Canyon area of the lake.

Mark Twain Management Area (WROS description is Rural Developed) is in Tuolumne County, on the northeastern portion of New Melones Lake, adjacent to SR 49. Recreation opportunities in this planning area include sheltered cove swimming and fishing. Despite its high use, there has been minimum facility development. Reclamation's headquarters and visitor center are in this planning unit (see Section 5.2.21., Interpretive Services and Visitor Information). Boat launching that had occurred near the intersection of Studhorse Flat Road and Highway 49 is no longer allowed. As of April 2008, only car-top boats may be launched in this area.

Tuttletown Management Area (WROS description is Rural Developed) is the largest of the public use areas on the Tuolumne County side and the second most highly developed recreation area on the lake. The area consists of approximately 1,115 acres (450 hectares) and is accessed by Reynolds Ferry Road, off SR 49. This area is popular for overnight camping, group camping, day use picnicking, and boat launching. Recreational activities include hiking, biking, and fishing. To help alleviate vandalism, the Tuttletown Recreation Area entrance gate is closed at night and is reopened in the morning.

The Tuttletown Recreation Area has three campgrounds, Acorn, Manzanita, and Chamise, with a total of 161 campsites. There are no electrical hookups at any of the campground sites, and one RV dump station is available. All campgrounds have restrooms, showers, water taps, and barbeque/fire pits. Campsites at Tuttletown may be reserved through the National Recreation Reservation Service. When they have not been reserved, campsites are available on a first come, first served basis.

- *Acorn Campground*, with 69 sites, is on the north side of the Reynolds Ferry Road and is the largest of the three campgrounds in the Tuttletown Recreation Area. Acorn sits at the highest elevation and therefore is the campground farthest from the water. Shade is limited, so this campground is most popular in the winter. The Heron Point Trail can be accessed from the campground and connects users to the Heron Point day use area.
- *Manzanita Campground* is in the southeastern portion of the recreation area and has 56 sites. Two campsites have been updated for ADA compliance. This campground was established for lower access to the water; however, in 2006 one loop of this campground was inundated.
- *Chamise Campground* is on the southwestern portion of the recreation area. It is the smallest of the three campgrounds in the Tuttletown Recreation Area with

only 36 sites. This campground has walk-in and standard sites only, and trailers are not permitted.

In addition to the three campgrounds described above, the Tuttletown Recreation Area also contains two group camps, Fiddleneck and Oak Knoll. Fiddleneck Group Camp has six group sites that can accommodate 40 to 60 people. Oak Knoll has 10 group sites that can accommodate 20 to 50 people. Camp hosts volunteer to regulate the sites year round. Several campsites have been redesigned to accommodate users with special needs. Improvements include ensuring that the sites are very flat and that wheelchair-accessible restrooms and wheelchair-friendly picnic tables are provided. Fiddleneck has an accessible flush toilet but no showers, while Oak Knoll has an accessible vault toilet. Both sites are available by reservation through the National Recreation Reservation Service.

Tuttletown has three day use areas (Heron Point, Lupine, and Eagle Point), one fish cleaning station, one RV dump station, and hiking and biking trails. Three seven-lane boat ramps, for use at various reservoir levels, are at the end of the Reynolds Ferry Road. The Heron Point Trail can be accessed at the Heron Point Day Use Area, and more trails are planned for development.

French Flat Management Area (WROS description is Rural Developed) lies between the highly developed Tuttletown planning area and the more rural Bear Creek Planning Area. This area has no developed recreational facilities but is popular for inappropriate uses such as late-night parties, target shooting, and ORV use. Access to this area is via a BLM parcel, and there is no vehicle access through Reclamation lands or private easements.

Bear Creek Management Area (WROS description is Rural Developed) is in Tuolumne County on the eastern shoreline of New Melones Lake. This area is popular with boaters because it provides a natural setting with many coves, bays, and islands. The shoreline has no developed recreational facilities. Popular activities include fishing and houseboating, and waterskiing is popular in the main body of open water. Additional recreation includes hiking, hunting, bird watching, and any other activities that do not require vehicle access. This planning area is accessible via Shell Road; Old Melones Dam Road also provides access but is fenced and gated and vehicular access is restricted.

Peoria Wildlife Management Area (WROS description is Rural Natural) is in Tuolumne County and was set aside as an area dedicated to wildlife habitat protection and enhancement. Management objectives focus on wildlife enhancement measures and habitat mitigation, with dispersed recreation permitted. However, activities such as hunting, horseback riding, hiking, wildlife viewing, and mountain biking occur here, and the area offers opportunity for grazing leases in the future. Campfires, camping, target shooting, and vehicles are prohibited from this area past the gates.

Table Mountain Planning Area is within the PWMA, just inland from the Bear Creek Management Area at the end of Shell Road. This is one of the most sensitive ecological areas within Reclamation lands, and Reclamation manages it to protect sensitive habitats

and species. This area has minor facility development, including a parking area at the trailhead and one vault toilet.

The Peoria Flat Planning Area is also within the PWMA. It includes the RC Flyers landing strip, Baseline Conservation Camp, the powerhouse warehouse (including equipment and materials storage), the New Melones Archaeological Storage Facility, an equestrian area, hiking trails, wastewater and water treatment facilities (both associated with Baseline Conservation Camp), power transmission lines, a closed overlook with facilities (such as parking, restroom, picnic area, and displays), trails, a wastewater evaporation pond, and fencing.

Rock climbing is the most notable recreation, predominately at two locations, the Grotto and the White Room, both situated on the west-facing side of Table Mountain. Other prominent activities in this area include hiking, mountain biking, wildlife viewing, and hunting. From the trailhead, hikers can follow a trail that leads to the top of Table Mountain. In fall, winter, and spring, Reclamation park rangers offer guided hikes along this same route. From the top, visitors have panoramic views of New Melones Lake and surrounding lands. Table Mountain also provides extensive northern basalt flow vernal pool habitat. Mastiff bat, golden eagle, and great horned owl sightings are common. Hunting for such species as deer, quail, and mourning dove is a popular activity at Table Mountain.

Dam and Spillway Management Area (WROS description is Rural Developed) is in Tuolumne and Calaveras Counties and consists of the area south of the dam and north of the lake spillway. This area is not subject to development for recreation. Public vehicles, hunting, and fishing below the dam to the buoy line are not permitted within the restricted area around the dam and powerhouse. No public access is permitted within the spillway.

Bowie Flat Management Area (WROS description is Rural Natural) became part of the New Melones Lake Area to provide a borrow area for construction of the dam. The area is suited for dispersed recreation, and there is no overland access.

Westside Management Area (WROS description is Rural Natural) is in Calaveras County and contains an extensive collection of cultural resources, particularly in Texas Charley Gulch. This area is suited for dispersed recreation, and there is no overland access.

Greenhorn Creek Management Area (WROS description is Rural Natural) in Calaveras County is well known as a fishing cove and is used by houseboats. It offers no recreational development and there is no overland access.

Glory Hole Management Area (WROS description is Rural Developed) is in Calaveras County in the midbasin vicinity of the New Melones Lake Area. It can be accessed from SR 49 via Whittle Ranch Road. This management area is composed of the main portion, which includes the large peninsula extending into the lake, and is the location of the New Melones Lake Marina. Within Glory Hole Water Management Unit is the Angels Creek

Recreation Area. This is the most highly developed recreation area on the lake and provides an array of recreation opportunities, ranging from day use picnicking to boat launching and take-out. This area is a major boat launch, parking, and transportation corridor for boaters traveling to the main body of the lake. The only public beach on the lake is located here and has picnic tables and barbeque grills, although there is no lifeguard. Other facilities within the Glory Hole Management Area include boat ramps, parking lots, picnic shelters, and fish cleaning stations. Trails are available for hiking and mountain biking. Equestrian use and hunting are not permitted.

The Glory Hole Recreation Area has two campgrounds, Ironhorse and Big Oak, with a total of 144 campsites. Campsites can be reserved through the National Recreation Reservation Service. Trailhead parking and facilities are available.

- *Ironhorse Campground* is on the west side of the Glory Hole Access Road and has water taps, barbeque/fire pits, and full-service restrooms with showers. Updates have been made to one campsite to comply with ADA, and a park host site has been added.
- *Big Oak Campground* is on the east side of the Glory Hole Access Road and has restrooms, showers, water taps, and barbeque/fire pits. Two campsites have been updated to comply with ADA, and a park host site has been added.

Glory Hole Recreation Area gate is closed at night to help alleviate vandalism. Day use areas are Buckbrush, Angels Creek, Black Bart, and Osprey Point. There are hiking and biking trails, in addition to the only concessionaire-operated marina on New Melones Lake. Four boat ramps are used for high, medium, and low water levels. Three of the four boat ramps have seven lanes, while the lowest ramp has two lanes.

Coyote Creek Management Area (WROS description is Rural Natural) is in Calaveras County off Parrotts Ferry Road. This historically significant area is freely accessible to the public and provides the only access to the Natural Bridges caves. Minor facility development at this site includes a parking area at the Natural Bridges trailhead and one vault toilet. The trail, rated as moderately difficult, leads 0.7 mile (one kilometer) to the Natural Bridges caves on Coyote Creek. The Natural Bridges day use area is popular for hiking, spelunking, swimming (wading or floating), and picnicking. Many people enjoy floating through the caves on inner tubes or inflatable mattresses. During fall, winter, and spring, Reclamation's park rangers lead interpretive hikes in this area to teach visitors about the unique geologic history.

North Bay Management Areas (WROS description is Rural Developed/Rural Natural) is most associated with boaters and lake users coming from the Glory Hole boat ramps and marina. Boaters transit this area on the way to other parts of the lake or use the area for waterskiing or fishing.

Middle Bay Management Area (WROS description is Rural Developed) is most associated with lake users coming from the Tuttletown boat ramps and campgrounds. As

with the North Bay Management Area, boaters transit this area or use it for waterskiing. Floatplanes also land in this area on occasion.

South Bay Management Area (WROS description is Rural Developed/Rural Natural) is used extensively by water skiers due to the presence of a water ski park at the south end of the main body of the lake.

5.2.21 Aquatic Recreation

The New Melones Lake Area is most popular with visitors for its aquatic recreation opportunities. At full capacity, there are approximately 12,500 surface acres (5,000 hectares) of water available for aquatic recreation. Activities such as fishing, swimming, boating, kayaking, white-water rafting, houseboating, and water skiing all occur on the lake.

New Melones Lake accounts for about 12,500 surface acres (5,000 hectares) of the approximately 27,000 acres (10,900 hectares) of Reclamation-administered lands in the study area and holds up to 2.4 million acre-feet (2.9 million megaliters) of water. The lake is surrounded by approximately 100 miles (160 kilometers) of shoreline.

A 2007 telephone and on-site survey of residents in the New Melones Lake Area yielded data on visitor use trends (Reclamation 2008).

Aquatic recreation was identified as the most common recreation activities:

Swimming – 59.0%

Motor Boating – 57.2%

Fishing (shoreline/boating) – 41.9%

Water Skiing/Wakeboarding – 41.7%

Camping – 37.4%

Beach Activities – 35.0%

Using Open Spaces – 31.8%

Wildlife Viewing – 30.7%

Table 5-27 lists a summary of aquatic recreation activities, by primary management areas, in the New Melones Lake Area.

Table 5-27: Summary of Aquatic Recreation by Management Area

Aquatic Activity	Primary Management Areas	Description
Raft launching and takeout	Camp Nine, Parrotts Ferry	Camp Nine is the only designated launch site for rafters. Parrotts Ferry is one of the main takeout sites for rafters.
Boat launch and retrieval	Parrotts Ferry, Mark Twain, Tuttletown, Glory Hole	Parrotts Ferry has a one-lane walk in hand launch area that lacks any

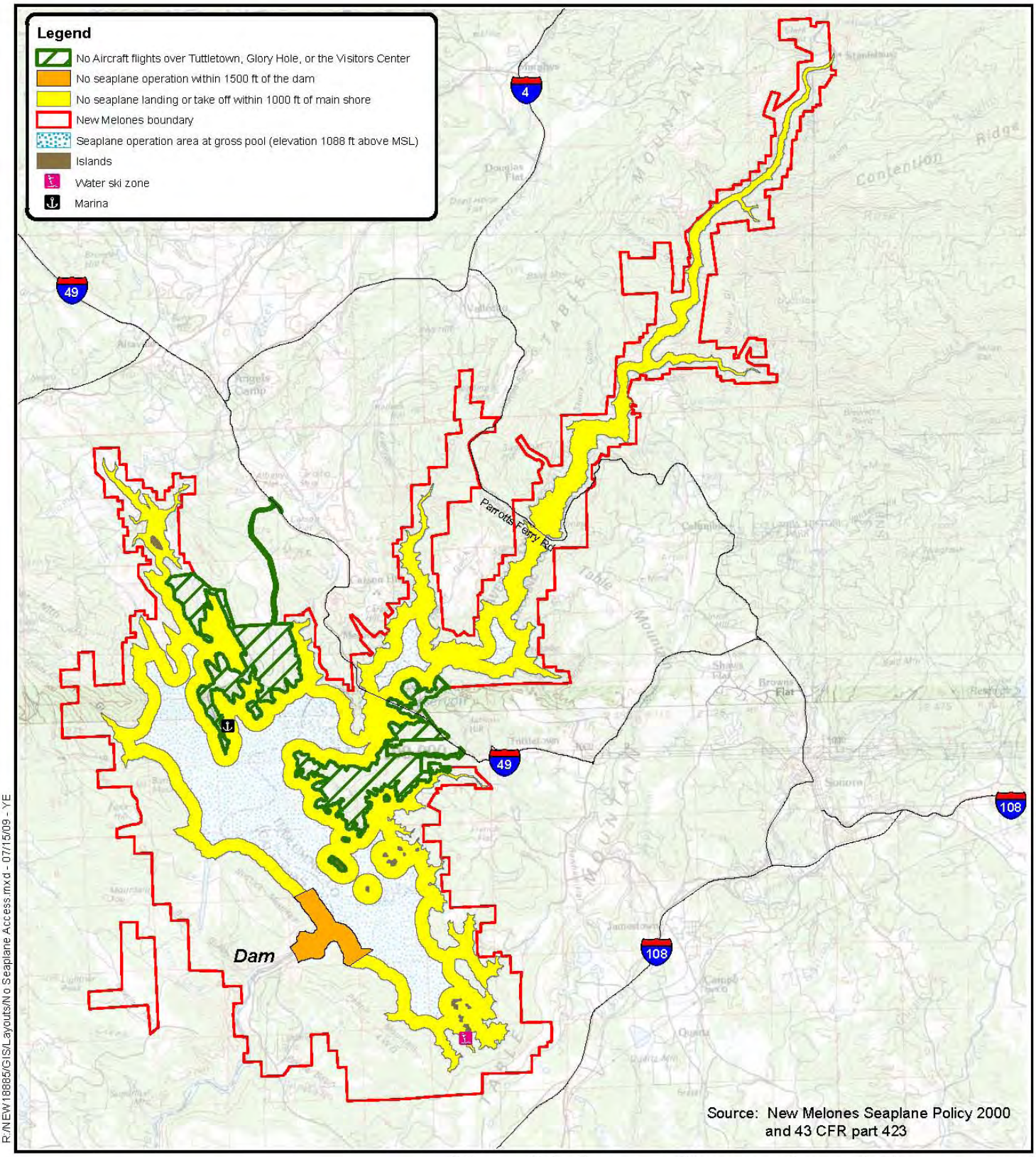
Table 5-27: Summary of Aquatic Recreation by Management Area

Aquatic Activity	Primary Management Areas	Description
		docks, buoys, signs, or other facilities. Mark Twain has a one-lane car-top boat ramp that is in poor condition. This management area also lacks docks, signs or other facilities, such as parking. Tuttletown has a three-level boat launching facility, and Glory Hole has a four-level boat launch facility.
Water skiing	North, Middle, and South Bays, south portion of Stanislaus River Canyon	The middle portion of the lake offers relatively uncrowded conditions for water skiing, compared to more enclosed areas. South Bay contains a popular water-skiing course.
Swimming	Glory Hole, Mark Twain, Tuttletown, Coyote Creek, Camp Nine, Parrotts Ferry	The Natural Bridges day use area is popular for wading in streams. Glory Hole has a swimming beach.
Boat rental	Glory Hole	Glory Hole is the only area where houseboats are available for rent. Houseboats, along with patio boats, fishing boats, water skis, personal watercraft, and boat slips, are available for rent from the marina.
Fishing	Fishing occurs in all management areas except Bowie Flat.	Though fishing occurs in most management areas, Stanislaus River Canyon, Spillway and Dam, Horseshoe Bend, and Greenhorn Creek are particularly known for their fishing.
Floatplane landing	North, Middle, and South Bays	Floatplanes may land in specified zones within the North, Middle, and South Bays, in accordance with Reclamation guidelines (Figure 5-14).
Radio-controlled airplanes	Dam and Spillway, PWMA	A model airplane club is allowed use of an abandoned airstrip to fly radio-controlled model aircraft. The airstrip in the PWMA is shared with CAL FIRE.

Source: Reclamation 1995

Swimming is a popular activity but is most often enjoyed from a boat, due to limited access and inadequate shoreline conditions (such as steep slopes and lack of beaches or grassy areas). Glory Hole provides the only designated swimming area on the lake, but no lifeguard services are offered, and swimming is not allowed within 100 feet (30 meters) of launch ramps and public docks, including the marina docks.

Motorized boats are abundant on New Melones Lake as a means to enjoy recreation opportunities, such as waterskiing, swimming and fishing, and sightseeing. Houseboats and personal watercraft also are used on the lake. The only location in the New Melones Lake Area that has boat rentals or boat mooring facilities is at the New Melones Marina. There are no speed limits on the water, except those required under the State of



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New Melones Current and Proposed Seaplane and Aircraft Operation Policy

New Melones Lake Area, California
Central California Area Office

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Miles

Figure 5-14

California Department of Boating and Waterways regulations. That is, the maximum speed is five miles an hour for motorboats within 100 feet (30 meters) of a bather (but not a water skier) and within 200 feet (60 meters) of a beach, swimming float, diving platform or life line, passenger landing being used, or a landing where boats are tied up (California Department of Boating and Waterways 2007).

The number of houseboats allowed on the lake at one time is limited, but there is no limit to the number of other motorized boats allowed. The current capacity is 50 private houseboats on mooring balls, 38 private houseboats in houseboat slips, and 20 rental houseboats. Reclamation maintains a total of 17 boat ramp lanes at Glory Hole, Angels Creek, and Tuttletown (Haas 2003). When the water drops below certain levels, some of these lanes cannot be used. Reclamation does not maintain the unimproved boat ramps at Mark Twain and Parrotts Ferry (Laird 2009b). Table 5-28 provides a list of the available boat ramps, along with their elevation range.

Table 5-28: Available Boat Ramps at New Melones Lake

Location	Number of Lanes	Elevation Range (feet)
Glory Hole: Lowest Ramp	6	860-900
Low Ramp		899-943
Medium Ramp		940-1,028
High Ramp		1,025-1,088
Angels Creek Ramp	4	975-1,088
Tuttletown Ramp: Low Ramp	7	900-962
Medium Ramp		962-1,036
High Ramp		1,031-1,088
Mark Twain Unimproved Lake Access	1	760+ (car-top loading only)
Parrotts Ferry Unimproved Lake Access	1	760+ (car-top loading only)

Source: Glory Hole Sports 2006

Fishing is one the most popular water-based recreation activities on New Melones Lake. It occurs throughout the lake, as the preferred fishing locations vary according to the type of fish species sought and also with the seasons. The CDFG issues permits, regulates fishing activities at New Melones, and ensures compliance with CDFG regulations. Since 1992, Reclamation has sponsored a Kids Day Fishing Derby to celebrate and support National Fishing Week. As many as 75 fishing tournaments are also held and range from those sponsored by local clubs with a small participation size to regional events with over one hundred participants. Reclamation and CDFG issue permits for these tournaments.

White-water kayaking and rafting is also enjoyed in Camp Nine sections, subject to appropriate water levels. Flatwater paddling, such as in canoes or touring kayaks, has expanded in popularity in recent years. These activities occur almost exclusively during periods of low lake water levels. Most of the white-water rafting consists of organized concessionaires that provide day-long, guided raft trips. However, individuals may also kayak and raft the lake/river. Depending on water levels, the white-water trip can be up

to nine miles long. In some parts of the New Melones Lake Area, water flows, controlled upstream by PG&E's hydro facilities, provide Class II to Class III rapids.

Not as popular as the activities listed above but still present on the lake are sailing and windsurfing. The low popularity of these pastimes may be attributed to the steep hills that enclose the lake and create a wind-protected environment throughout much of the year.

Suction and dredge recreational gold mining takes place in the flowing water of tributaries to the lake and is accessed by motorboat. This type of mining involves vacuuming sediment, sifting it for gold particles, and then discharging most of the sediment back into the water. It is permitted and regulated by the CDFG. CDFG regulations concerning suction dredging are outlined in Sections 228 and 228.5, Title 14, California Code of Regulations.

Floatplanes/seaplanes use the lake for landing in specified zones within the north, middle, and south bay areas. Reclamation seaplane use policy on the lake allows seaplane operation for recreation only. The policy is authorized in accordance with applicable Federal Aviation Administration rules and regulations, as well as other conditions stipulated in the policy (Figure 5-14).

5.2.22 Land-Based Recreation

Of the approximately 27,000 acres (10,900 hectares) managed by Reclamation on and surrounding the New Melones Lake Area, about 15,000 acres (6,000 hectares) are on land. Camping and day use facilities are readily available on the lake, but many areas are not accessible for recreation largely due to topography. Surrounding the lake, there are about 27 miles (45 kilometers) of trails available for hiking and biking, and some of these are suitable for horseback riding.

Camping is a popular land-based recreation and is restricted to two developed recreation areas, Glory Hole and Tuttletown. Glory Hole has two campgrounds and a total of 144 campsites. Tuttletown Recreation Area has three campgrounds with 161 campsites.

Tuttletown also has two group camps, with a total of 16 group sites that can accommodate up to 110 people in total. Camping is restricted to a maximum of 14 days within a 30-day period. Standard campsites are limited to eight people, and walk-in campsites are limited to four people. For more details on recreation areas and camping at New Melones Lake, see Section 5.2.20, Facilities, Land Use, and Management Areas; and Appendix E, New Melones Lake Policy.

Both Glory Hole and Tuttletown Recreation Areas also have day use facilities. Glory Hole has four day use areas with 61 picnic sites, the only concessionaire-operated marina on New Melones Lake, and other facilities. Tuttletown has three day use areas with 52 picnic sites, and other facilities such as a fish cleaning station and RV dump station.

Hunting is open on all of Reclamation's lands surrounding the lake, with the exception of Tuttletown, Glory Hole, and Mark Twain, but takes place mostly within or near the

PWMA. The CDFG issues hunting licenses and regulates this activity on Reclamation lands.

Bank fishing and gold panning occur along the shoreline.

There are many caves throughout the study area, and many visitors are involved in spelunking, or caving. This activity is restricted to a handful of caves, with the most frequented caves being the two Natural Bridges located within the Coyote Creek tributary.

Hiking, bicycling, and horseback riding all occur at New Melones Lake. There are approximately 25 miles (40 kilometers) of trails, which is considered to be a very small amount compared to the acreage of the planning area. Table 5-29 summarizes land-based recreation opportunities, by management area, available at the New Melones Lake Area.

Table 5-29: Summary of Land-Based Recreation by Management Area

Activity	Primary Management Area	Description
Biking	Glory Hole, PWMA, Tuttletown	Approximately 25 miles (40 kilometers) of multiple-use trails exist in the planning area.
Camping	Tuttletown (3), Glory Hole (2)	Camping is allowed only in these two management areas.
Day use (designated)	Tuttletown (2), Glory Hole (4), Coyote Creek, Mark Twain, French Flat, Bear Creek	Day use facilities include parking areas, picnic areas, and lake access.
Day use (undesignated)	Rose Creek area of Stanislaus River Canyon, Mark Twain, Table Mountain, PWMA	Though this is not designated as a day use area, Rose Creek in the northern part of this management area is informally used by white-water rafters and motor boaters and is subject to intensive use. Mark Twain is also used informally as a day use area.
Hiking	PWMA, Glory Hole, Mark Twain, Coyote Creek, Tuttletown	Approximately 25 miles (40 kilometers) of multiple-use trails exist in the planning area.
Horseback riding	PWMA	Approximately 10 miles (16 kilometers) of multiple-use trails exist in the planning area. Horseback riding is allowed on certain trails.
Hunting	Primary hunting area is PWMA	Hunting is allowed at all areas except for Tuttletown, Glory Hole, and Mark Twain.
Picnicking	Glory Hole, Tuttletown, Coyote Creek, Mark Twain	Developed day use areas offer picnicking at Glory Hole and Tuttletown, while a more informal setting is found at Mark Twain and Coyote Creek.

Table 5-29: Summary of Land-Based Recreation by Management Area

Activity	Primary Management Area	Description
Rock climbing	PWMA	Rock climbing occurs at the Grotto and the White Room, both located on Table Mountain.
Spelunking	Coyote Creek, Stanislaus River Canyon	Easy spelunking is offered at Natural Bridges. More advanced cave exploration occurs in the limestone caverns in the Stanislaus River Canyon.
Visitor center, interpretive services	Mark Twain, Glory Hole	Glory Hole contains an amphitheater used for interpretive programs, while the visitor center at Mark Twain has informative displays, interpretive programs, picnic tables, flush toilets, and drinking water.*

Notes: *For more information, see Section 5.2.20.
Source: Reclamation 1995

5.2.23 Interpretive Services and Visitor Information

The New Melones Lake Visitor Center is accessible from SR 49, midway between the towns of Sonora and Angels Camp in the Mark Twain Planning Area. General information, directions, and maps are available at the center. In addition, the visitor center showcases a variety of displays and exhibits, including the area's geologic past, Miwok Indian and early human history, the California Gold Rush, natural history, and the New Melones Dam and Reservoir Project. Visitors can also see displays of some of the wildlife that inhabits the New Melones Lake Area.

The New Melones Lake Visitor Center hosts various events, including a fall and spring lecture series, throughout the year. This lecture series takes place on Thursday evenings which, in the past, has focused on the area's cultural and natural history. Several times a year public stargazing programs are offered at the visitor center.

During the fall, winter, and spring, park rangers at New Melones Lake schedule interpretive walks and hikes to explain the area's cultural and natural history. Park rangers provide formal campfire programs and children's programs throughout the summer recreation season. Most of these programs are held at the Glory Hole amphitheater located in the Ironhorse Campground.

5.2.24 Utilities

Recent and planned upgrades to the utilities infrastructure have provided water and improved its reliability (Brooks 2007). The need to provide additional wastewater and solid waste services continues to change as recreation demands change, such as new types of recreation in new areas and fluctuating user levels.

Electrical Services. PG&E provides electrical service to the headquarters, visitor center, maintenance building in the Mark Twain Management Area, a private concessionaire at Glory Hole Management Area marina, and the southern end of the reservoir for dam operations and the New Melones Archaeological Storage Facility and Baseline Camp (Brooks 2007). An emergency generator has been installed to service the administration/visitor center complex. The Western Area Power Authority provides electrical service to Glory Hole and Tuttletown Management Areas. With few exceptions, all of the electrical lines are aboveground. Some electrical lines are owned by Reclamation and are maintained by Western Area Power Authority, which may contract out maintenance work to PG&E occasionally. Both PG&E and WAPA are required to coordinate all electrical line maintenance with Reclamation to ensure protection of cultural and natural resources. Solar panels on top of the maintenance building provide electricity to the immediate buildings.

Water. A needs assessment identifies water system demands at the New Melones Lake Area (Reclamation 2001). The assessment was based on planned recreation facilities identified in the Master Plan (USACE 1976). Table 5-30 is a summary of projected system demands.

Table 5-30: Estimated Peak-Day (Gallons) Water Demand for 2040

Recreation Area	Day Use	Campers	Total Demand
Tuttletown	48,405	36,225	84,630
Glory Hole	48,750	56,700	105,450
Angels Arm	19,905	17,500	37,405
	Visitors	**Staff**	**Total Demand**
Visitors Center	6,600	150	6,750
Administration Offices	1,200	0	1,200
Total	**123,660**	**111,775**	**235,435**

Source: Reclamation 2001

Reclamation maintains one 50,000-gallon (190,000-liter) water storage tank and one 80,000-gallon (300,000-liter) tank at Tuttletown Recreation Area, one 36,000-gallon (135,000-liter) tank at Angels Arm, and one 50,000-gallon (190,000-liter) tank at Glory Hole Recreation Area (Brooks 2007). There are also two 16,000-gallon (60,500-liter) tanks at the Glory Hole Recreation Area marina. One of these, installed in 2005, is owned by Reclamation and is used for water storage and fire supply; the other is owned by the marina operator.

Glory Hole Recreation Area has two wells that provide water for public uses, including for the restrooms and for water spigots (Brooks 2007). A third well at the marina is used by staff and for concessionaire operations, such as cleaning houseboats and filling houseboat water tanks and hot tubs. Water from the reservoir at Glory Hole Recreation Area is no longer treated.

Angels Arm has a new water treatment plant, installed in 2006, that treats water from the lake to provide potable water for the Angels Arm launch ramp restroom and fish cleaning station for the and Buckbrush Day use area (Brooks 2008). An additional well is required in the Angels Arm area because the current water source is unreliable. A new well has been developed in the Tuttletown Recreation Area to provide increased water supply and to improve the water supply; the former well is now used as a backup (Brooks 2008). The treatment plant is still used to treat the well water for odor and taste.

Approximately 25 people at the headquarters, maintenance building, and visitor center are served by a well. There is no potable water available at any of the undeveloped recreation areas.

Wastewater. A needs assessment identifies wastewater systems demands at New Melones Lake (Reclamation 2001), based on planned recreation facilities identified in the Master Plan (USACE 1976). Table 5-31 is a summary of projected system demands.

Table 5-31: Estimated Maximum Wastewater Production Rates (Gallons per Day) for 2004

Recreation Area	Day Use and Campers
Tuttletown	60,766
Glory Hole	43,741
Visitors Center and Administration Offices	1,070
Total	**51,721**

Source: Reclamation 2001

Glory Hole and Tuttletown Recreation Areas and the Baseline Conservation Camp generate wastewater that is piped to evaporation ponds and then to polishing ponds (Brooks 2007). Some of the wastewater is then applied to spray fields.

The Glory Hole Recreation Area generates wastewater from the campground restrooms, the day use areas, boat launches, RV dump station, fish cleaning stations, houseboats, and floating restrooms (Brooks 2007). It is either piped to or trucked to wastewater lagoons, or it is taken off-site by private commercial services.

Tuttletown Recreation Area generates wastewater at the restrooms and RV dump station (Brooks 2007). The wastewater at the RV dump station is trucked to the wastewater lagoons. The wastewater at the restrooms is either piped to the wastewater lagoons or is taken off-site by private commercial services.

The headquarters, maintenance building, and visitors center generate wastewater that is piped to a nearby leach field (Brooks 2007). Visitors and approximately 25 staff members generate wastewater in this area.

The Baseline Conservation Camp at the southern end of the reservoir has a California Department of Corrections Facility and CAL FIRE facility (Brooks 2007). The wastewater from these facilities and from spray fields is piped to the evaporation ponds.

Wastewater from the Reclamation power plant at the southern end of the lake is kept in a holding tank for off-site removal by private commercial services.

Waste from portable toilets at all of the recreation areas (Brooks 2007) is taken off-site by private commercial services or to the wastewater lagoons.

Solid Waste. Private commercial services remove solid waste (Brooks 2007). The closest transfer stations to the lake in Calaveras County are in Vallecito and Copperopolis (Calaveras County 2007d). The closest transfer station to New Melones Lake in Tuolumne County is the Cal Sierra Transfer Station in Sonora (Roberston 2007).

Communications. A microwave tower on top of Peoria Mountain, which is in the southern portion of Reclamation lands, is used for communications between headquarters and the dam (Brooks 2007). Tuttletown Recreation Area has a radio repeater that Reclamation uses for staff communication.